Japanese Energy Markets

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Resources

EEX Futures / Options - <https://www.eex.com/en/downloads#%7B%22downloads-container_0%22%3A%7B%22searchTerm%22%3A%22japan%22%7D%7D>

JPX - <https://clientportal.jpx.co.jp/ClientPortalEN/s/>

Wide Area Reserve - <https://web-kohyo.occto.or.jp/kks-web-public/>

Tepco Forecasts - <https://www.tepco.co.jp/forecast/>

Good Summary - <https://skippingstone.com/wp-content/uploads/2024/10/Japan-Market-Update-Webinar-2024-for-web.pdf>

Balancing Auctions -<https://www.openadr.org/assets/210422_DER_METI_Mr.%20SAKUMA.pdf#:~:text=kWh%20bid%20Bid%20is%20closed,ahead>

EPRX Balancing - <https://www.eprx.or.jp/>

Imbalance prices - <https://www.imbalanceprices-cs.jp/>

FAQ on imbalance - <https://www.imbalanceprices-cs.jp/faq-inquiry>

Renewables Map - <https://www.renewable-ei.org/en/activities/statistics/20200619.php?utm_source=chatgpt.com>

**Market Structure**

**1. Bilateral Forward & PPA Markets**

* **Power Purchase Agreements (PPAs)**: Long-term bilateral contracts (5–20 years) specifying fixed or indexed prices for agreed MWh volumes—either pay-as-produced or baseload PPAs [Wikipedia](https://en.wikipedia.org/wiki/Power_purchase_agreement?utm_source=chatgpt.com).
* **Electricity Forward Agreements (EFAs)**: Standardized calendar load profiles (EFA days/weeks) used OTC among traders to hedge specific load blocks [Wikipedia](https://en.wikipedia.org/wiki/Electricity_Forward_Agreement?utm_source=chatgpt.com).

**Futures**

| **Venue** | **Size** | **Areas** | **Type** | **Futures** | **Contract Availability** | **New Development** |
| --- | --- | --- | --- | --- | --- | --- |
| **EEX** | 1 MW/lot | Tokyo (East)Kansai (West) | **Baseload** | Day, Weekend, Week, Month, Quarter, Season, Year | Daily (Tokyo only) 33 days ahead  Weekly (Current + 4 weeks)  Monthly (Current + 9 months)  Quarterly (Next 7 quarters) Seasonal (Next 8 seasons)  Yearly (Next 6 years) | - Cascading from Yearly → Monthly & Quarterly-  Settles vs JEPX Baseload Index- |
| **EEX** | 1 MW/lot | Tokyo (East)Kansai (West) | **Peakload** | Day, Weekend, Week, Month, Quarter, Season, Year | Weekly (Current + 4 weeks)  Monthly (Current + 9 months)  Quarterly (Next 7 quarters)  Seasonal (Next 8 seasons)  Yearly (Next 6 years) | - Peak hours only: 08:00–20:00, Mon–Fri-  Cash settled vs JEPX  Peakload Index- Options available (Monthly Futures Options)- ECC + 2 Business Days for payment |

Settlement is purely financial: the floating price for each contract period is the arithmetic average of the half-hourly JEPX day-ahead auction prices over the delivery period.

**Options**

| **Venue** | **Underlying** | **Areas** | **Type** | **Exercise Style** | **Strike Price Step** | **Availability** | **New Developments** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EEX | Monthly Baseload Futures | Tokyo (East)  Kansai (West) | Call & Put Options | European Style | 0.5 yen/kWh | 9 consecutive months | First tradable from Feb 3, 2025  Minimum price tick: 0.001 yen/kWh  Options settle into futures if exercised |

Settlement and Premium Payment

* Final premium is paid on the next ECC business day after expiry.
* Daily margining: Premiums are marked to market daily, and any changes in value are settled between participants.
* Settlement involves allocation into a corresponding futures position at the strike price upon exercise**.**

Available Series

Each maturity month includes at least 3 strike prices:

* 1 In-the-Money
* 1 At-the-Money
* 1 Out-of-the-Money

Underlying Assets

Options are written on Baseload Monthly Futures for both:

* Tokyo Area
* Kansai Area

Pricing & Trading Unit

* Option price is quoted in JPY/kWh, precise to 0.001.
* Minimum contract increment is based on 1 MW for the full delivery month of the underlying future.

**Day Ahead and Intraday**

| **Market** | **Areas Covered** | **Time Format** | **Trading Method** | **Matching & Cutoff Times** | **Post-Trade Requirements** |
| --- | --- | --- | --- | --- | --- |
| **Day-Ahead Spot Market** | 9 Areas (Excludes Okinawa) | 48 slots of 30 min each per day | Single-price blind auction | - Bids open 10 days before- Final bids due 10:00 JST day before delivery- Matching once daily | Reflected in Next-Day OCCTO scheduling |
| **Intraday Market** | 9 Areas (Excludes Okinawa) | 48 slots of 30 min each per day | Continuous trading | - Opens 17:00 JST previous day- Closes 1 hour before each slot (e.g. 14:00–14:30 closes at 13:00) | Update and resubmit Next-Day OCCTO schedule by 1 hour before delivery |

**Balancing Market**

| **Japanese Expression** | **English Description** | **Required Response Time** | **Market Start** |
| --- | --- | --- | --- |
| Balancing Capacity III (2) | Replacement Reserve for FIT | 45 minutes | Started April 2021 |
| Balancing Capacity III (1) | Replacement Reserve | 15 minutes | Started April 2022 |
| Balancing Capacity II (2) | Frequency Restoration Reserve | 5 minutes | Started April 2024 |
| Balancing Capacity II (1) | Synchronized Frequency Restoration Reserve | 5 minutes | — |
| Balancing Capacity I | Frequency Containment Reserve (FCR) | 10 seconds | — |

Under the current (April 2022–onward) Imbalance Unit Price Central Calculation System, the “imbalance fee” you pay for each 30-minute frame is determined in three steps:

1. Base price (marginal kWh price of adjustment capacity)

After the day-ahead and intraday markets have closed, TSOs/DSOs activate their procured “adjustment capacity” (both from the JEPX supply-demand adjustment market and any wide-area surplus-capacity contracts). For each frame and each area, the system quotes the marginal kWh price of the last unit of capacity brought online to resolve imbalances.

1. Tightness surcharges

kW-tightness surcharge: If the “adjustment charge calculation index” (a kW-level tightness metric) falls below 10%, a kW tightness adjustment imbalance charge applies. In practice, that surcharge is currently capped at ¥200/kWh (provisionally through FY 2025; a future cap of ¥600/kWh has been legislated) .

kWh-tightness surcharge: Separately, if the weekly reserve-power rate (a kWh-level metric) is below 3%, a flat ¥80/kWh correction surcharge kicks in for all frames during that low-reserve week.

1. Final unit price = the highest of

The limit kWh price of adjustment capacity,

The kW-tightness charge (if triggered),

The kWh-tightness charge (if triggered).

Whichever of these three is greatest becomes the published imbalance fee unit price for that frame

**Summary**

**Under the current (April 2022–onward) Imbalance Unit Price Central Calculation System, the imbalance‐fee unit price for each 30-minute interval is determined as the highest of three candidates: the marginal kWh price of dispatched adjustment capacity, a kW‐tightness surcharge calculated from a “correction index,” and a kWh‐tightness surcharge during low‐reserve weeks** [**egc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**. The kW surcharge follows a piecewise linear formula between thresholds at 10 % and 3 %, ramping up to an interim cap C = 200 ¥/kWh (with a future cap of 600 ¥/kWh), while the kWh surcharge is a flat 80 ¥/kWh whenever the weekly reserve rate falls below 3 %** [**egc.meti.go.jpegc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**. All three values are computed centrally and published every 30 minutes for each area, ensuring transparent price signals** [**emsc.meti.go.jp**](https://www.emsc.meti.go.jp/info/public/pdf/20220117001b.pdf?utm_source=chatgpt.com)**.**

**1. Fee Components**

**1.1 Marginal kWh Price**

**The base unit price is the “limit kWh price” of the last increment of adjustment capacity dispatched in the wide-area balancing system, reflecting the marginal cost to correct real-time imbalances** [**egc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**.**

**1.2 kW-Tightness Surcharge**

* **Correction Index (補正料金算定インデックス):  
  Defined as**

**Available up-reserve−DemandDemand \frac{\text{Available up-reserve} - \text{Demand}}{\text{Demand}}DemandAvailable up-reserve−Demand​**

**at gate-close for each wide-area block** [**egc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**.**

* **Piecewise Linear Formula:  
  A straight-line interpolation maps the index to a surcharge level, using key breakpoints:**
  + **A (3 %): Emergency warning level**
  + **B (10 %): Initial activation of non-standard reserves**
  + **C (200 ¥/kWh): Interim cap (to rise to 600 ¥/kWh after FY 2025)** [**egc.meti.go.jpegc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**.  
    The surcharge begins above zero when the index falls below 10 % and increases linearly down to 3 %, reaching the cap C at or below that level** [**egc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**.**

**1.3 kWh-Tightness Surcharge**

**When the weekly kWh-reserve rate drops below 3 %, a flat surcharge of 80 ¥/kWh is applied for every 30-minute interval in that week** [**egc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**.**

**2. Final Unit Price Calculation**

**Imbalance-fee unit price = max{  
  • Marginal kWh price,  
  • kW-tightness surcharge,  
  • kWh-tightness surcharge  
}** [**egc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**.**

**3. Special Case: System Surplus**

**If the system experiences a net surplus (e.g., renewable output curtailment), the imbalance fee for that interval is set to 0 ¥/kWh rather than any of the above values** [**egc.meti.go.jp**](https://www.egc.meti.go.jp/info/public/pdf/20231121001d.pdf)**.**

**4. Regulatory Review**

**METI periodically reviews these parameters and may adjust thresholds or caps based on evolving grid conditions and stakeholder input** [**emsc.meti.go.jp**](https://www.emsc.meti.go.jp/activity/emsc_system/pdf/082_05_00.pdf?utm_source=chatgpt.com)**.**

**Imbalance Features**

1. Key Drivers of the Spot–Imbalance Spread

1. Forecast Errors
   * Load forecast error: if actual demand deviates from the day-ahead forecast, the TSO must procure balancing energy at penalized imbalance rates.
   * Renewables forecast error: especially solar/wind; un-forecasted drops or surges force intra-hour balancing.
2. Unexpected Plant Outages
   * Forced outages of large generators create scarcity, pushing imbalance prices above spot.
3. Transmission Constraints
   * Bottlenecks between regions can limit TSO’s ability to share reserves, so locally the imbalance price may spike relative to the national spot price.
4. Market Liquidity & Participation
   * Thin bidding in intraday or balancing auctions can amplify volatility: fewer offers to buy or sell imbalance energy widens the spread.
5. Regulatory Penalty Factors (α)
   * By design, the imbalance fee applies a markup (for shortages) or markdown (for surpluses) relative to the spot price. Changes to α over time alter the average spread.
6. Reserve Margin & System Tightness
   * In periods of low available reserves (e.g., winter peak), the balancing market clears at a premium over spot.
7. Time-of-Day & Seasonal Effects
   * Peak hours and seasons (summer air-conditioning or winter heating) tend to have higher volatility, leading to larger spreads.
8. Intraday Adjustment Volumes
   * If a participant can self-balance in the intraday market (buying or selling ahead of gate-closure), this reduces their exposure to imbalance pricing. The overall level of net intraday trades versus day-ahead trades influences market-wide spreads.
9. Price Caps & Market Interventions
   * Temporary regulatory caps (like the ¥200/kWh cap imposed in 2021) can compress or distort the normal relationship between spot and imbalance prices.
10. Regulatory Changes & Market Design Updates

* Introduction of new reserve products or changes in gate-closure rules can shift the supply-demand dynamics in balancing vs spot.

DATA

**Summary**

Japanese transmission and distribution operators (via OCCTO) and Tokyo Electric Power Company (TEPCO) publish a rich set of real-time and historical data covering:

* **Area- and block-level supply/demand** (actual and forecast)
* **Unit-level generation** and **FIT contract performance**
* **Renewable output forecasts and curtailment outlook**
* **Grid congestion** and **imbalance / adjustment capacity**
* **Quality-of-supply metrics** (frequency, voltage, outages)
* **Inter-regional flows** and **capacity-market auction results**
* **Market price data** from JEPX (day-ahead, intraday, spot) and, for derivatives, EEX.

TEPCO’s “でんき予報” site in particular aggregates and disseminates many of these variables for the Tokyo area and beyond.

**1. TEPCO “でんき予報” Data Portal**

TEPCO’s “でんき予報” (Electricity Forecast) portal publishes the following datasets for its service area – all downloadable as CSV and updated at 30-minute or hourly intervals:

**1.1 Area Supply-Demand Performance**

* **エリア需給実績データ** (“Area supply-demand actuals”): 30 min averages of demand (sum of generator outputs at the transmission point) and total available supply within the TEPCO zone, published within one hour of the interval’s close. [tepco.co.jp](https://www.tepco.co.jp/forecast/?utm_source=chatgpt.com)[tepco.co.jp](https://www.tepco.co.jp/forecast/html/area_data-j.html?utm_source=chatgpt.com)

**1.2 Unit-Level Generation Performance**

* **ユニット別発電実績データ** (“Generation by unit”): output records for each thermal, hydro, nuclear, and other generator, including small-scale and VPP units. [tepco.co.jp](https://www.tepco.co.jp/forecast/?utm_source=chatgpt.com)

**1.3 FIT Special-Contract Generator Performance**

* **FIT特例契約者の発電計画の実績データ** (“FIT‐special contract generation actuals”): performance data for renewable generators under FIT special conditions. [tepco.co.jp](https://www.tepco.co.jp/forecast/?utm_source=chatgpt.com)

**1.4 Renewable Curtailment Outlook**

* **再生可能エネルギー出力制御見通し**: forecast of necessary renewable output curtailments for system balancing. [tepco.co.jp](https://www.tepco.co.jp/forecast/?utm_source=chatgpt.com)

**1.5 Grid Congestion Information**

* **系統混雑情報**: congestion alerts and status on major transmission corridors within the area. [tepco.co.jp](https://www.tepco.co.jp/forecast/?utm_source=chatgpt.com)

**1.6 Imbalance Charges & Adjustment Capacity**

* **インバランス料金に関する情報公表**:
  + Area demand vs. forecast, BG (balancing group) plan totals, and actuals
  + **調整力に関する情報** (“Adjustment capacity”): volumes of reserve or balancing energy procured
  + **広域需給調整に関する情報** (“Wide-area balancing”): cross-regional balancing instructions
  + Imbalance charge announcements and pricing. [tepco.co.jp](https://www.tepco.co.jp/forecast/?utm_source=chatgpt.com)

**1.7 System Usage & Forecast**

* **電力使用状況データ** (Electricity usage status): hourly system peak supply capacity, predicted maximum demand, and actual usage, with update times. [tepco.co.jp](https://www.tepco.co.jp/forecast/html/juyo-j.html?utm_source=chatgpt.com)

**2. OCCTO-Published System Data**

The Organization of Cross-regional Coordination of Transmission Operators (OCCTO) aggregates data from all ten regional TSOs and publishes:

**2.1 Quality of Supply Metrics**

* **Frequency**: time-kept ratio within control band for synchronized regions (50 Hz east / 60 Hz west)
* **Voltage**: counts of deviations beyond statutory limits at 100 V/200 V points
* **Interruptions**: number, duration, and regional breakdown of supply interruptions  
  → Aggregated in their annual “Quality of Electricity Supply” report. [OCCTO](https://www.occto.or.jp/en/information_disclosure/report_on_the_quality/files/2021_qualityofelectricity_240202.pdf?utm_source=chatgpt.com)[OCCTO](https://www.occto.or.jp/en/information_disclosure/annual_report/files/2023_annualreport_240131.pdf?utm_source=chatgpt.com)

**2.2 Inter-Regional Power Flows**

* Monthly data on energy flows (GWh) across major interconnections (e.g. Hokkaido–Honshu DC links), with historical time series back to 2016. [Renewable Energy Institute](https://www.renewable-ei.org/en/activities/statistics/20200619.php?utm_source=chatgpt.com)

**2.3 Capacity Market Auction Results**

* OCCTO leads Japan’s capacity-market, publishing auction schedules, clearing prices, awarded capacity and any adjustments to market fundamentals. [OCCTO](https://www.occto.or.jp/houkokusho/2020/files/report_2020.pdf?utm_source=chatgpt.com)

**3. Market Price & Volume Data**

**3.1 JEPX Day-Ahead, Intraday & Forward Markets**

* **Prices** (¥/kWh) and **volumes** (MWh) by time-code for system and area prices, block orders, and contracted block orders
* Downloadable table and graph interface for Day-Ahead, Intraday, and Forward markets. [jepx.jp](https://www.jepx.jp/en/electricpower/market-data/spot/?utm_source=chatgpt.com)

**3.2 JEPX Spot Market (Daily)**

* 30-minute spot prices (¥/kWh) for each of the ten service areas
* Daily, weekly, monthly and annual averages available. [JEPX Information](https://www.jepx.info/en/spot?utm_source=chatgpt.com)

**3.3 EEX Japanese Power Derivatives Order-Book**

* Since April 2025, real-time order-book data and Base Month Options for Japanese power derivatives (settled on average JEPX spot prices for Tokyo & Kansai). [EEX](https://www.eex.com/en/newsroom/detail?cHash=ee8fbe72bbe6933407a0ad01d72a9da1&tx_news_pi1%5Baction%5D=detail&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Bnews%5D=13789&utm_source=chatgpt.com)

**In short**, beyond the demand/supply time series you already have, Japan’s TSOs and market operators publish detailed generation, balancing, quality, flow, capacity auction, and price data – all crucial for market analysis, forecasting, and trading.

MORE DATA

Below is an overview showing that **all ten regional utilities** in Japan publish real‐time (and often historical) supply–demand data for their service areas, much like TEPCO’s “でんき予報.” Each company offers a web portal with downloadable CSVs and graphical dashboards, typically updated every 30 minutes to one hour.

**1. Hokkaido Electric Power (HEPCO)**

HEPCO provides its “北海道エリアの需給実績” page on ほくでんネットワーク, where you can view and download 30-minute average demand and available‐supply data going back several years in CSV format [北海道電力](https://www.hepco.co.jp/network/con_service/public_document/supply_demand_results/index.html?utm_source=chatgpt.com)[denkiyoho.hepco.co.jp](https://denkiyoho.hepco.co.jp/supply_demand_results.html?utm_source=chatgpt.com).

**2. Tohoku Electric Power (TOHOKU)**

東北電力 publishes “エリア需給実績” with速報値 (provisional values) including estimated corrections, accessible on their Setsuden portal. Data are downloadable as daily CSVs covering up to the current month [setsuden.nw.tohoku-epco.co.jp](https://setsuden.nw.tohoku-epco.co.jp/realtime_jukyu.html?utm_source=chatgpt.com)[setsuden.nw.tohoku-epco.co.jp](https://setsuden.nw.tohoku-epco.co.jp/download.html?utm_source=chatgpt.com).

**3. Chubu Electric Power (CHUDEN)**

中部電力パワーグリッド’s “でんき予報” site shows demand, supply, peak forecasts, unit‐level generation, and curtailment outlooks for the Chubu region, updated at 30-minute intervals, with CSV download links [中部電力パワーグリッド](https://powergrid.chuden.co.jp/denkiyoho/?utm_source=chatgpt.com)[中部電力パワーグリッド](https://powergrid.chuden.co.jp/denkiyoho/setsuden2022/index.html?utm_source=chatgpt.com).

**4. Hokuriku Electric Power (RIKUDEN)**

北陸電力送配電’s “北陸エリア需給実績” offers 30-minute supply–demand graphs and CSV downloads for the Hokuriku block, with provisional figures that are revised as needed [北陸電力株式会社](https://www.rikuden.co.jp/nw/denki-yoho/results_jyukyu.html?utm_source=chatgpt.com)[北陸電力株式会社](https://www.rikuden.co.jp/nw_jyukyudata/?utm_source=chatgpt.com).

**5. Kansai Electric Power Transmission & Distribution (KANDEN‐TD)**

関西電力送配電’s “でんき予報” publishes the “関西エリアの需給実績” dashboard, featuring stacked‐area graphs by fuel type and a CSV download section for historical data [kansai-td.co.jp](https://www.kansai-td.co.jp/denkiyoho/area-performance/index.html?utm_source=chatgpt.com)[kansai-td.co.jp](https://www.kansai-td.co.jp/denkiyoho/area-performance/past.html?utm_source=chatgpt.com).

**6. Chugoku Electric Power Network (ENERGIA)**

中国電力ネットワーク’s “供給区域の需給実績” page provides 30-minute interval supply–demand figures, downloadable by date, under OCCTO guidelines [中国電力](https://www.energia.co.jp/nw/jukyuu/eria_jukyu.html?utm_source=chatgpt.com)[中国電力](https://www.energia.co.jp/nw/service/retailer/data/area/?utm_source=chatgpt.com).

**7. Shikoku Electric Power Transmission & Distribution (YONDEN)**

四国電力送配電 publishes “需給実績” with up‐to‐date 30-minute data, interactive graphs, and CSV downloads for the Shikoku region [四国電力](https://www.yonden.co.jp/nw/supply_demand/index.html?utm_source=chatgpt.com).

**8. Kyushu Electric Power Transmission & Distribution (KYUDEN)**

九州電力送配電’s “エリア需給実績データ” portal offers provisional 30-minute supply–demand statistics (with post-month‐end revisions), alongside generation‐by‐fuel breakdowns [kyuden.co.jp](https://www.kyuden.co.jp/td_area_jukyu/jukyu.html?utm_source=chatgpt.com).

**9. Okinawa Electric Power (OKIDEN)**

沖縄電力 publishes “需給関連情報” where you can download annual CSV files of past supply–demand performance (2016 onward), with a legacy download format for pre-2024 data [okiden.co.jp](https://www.okiden.co.jp/business-support/service/supply-and-demand/?utm_source=chatgpt.com).

In **every** regional jurisdiction—from Hokkaido down to Okinawa—utilities maintain portals akin to TEPCO’s “でんき予報,” offering both graphical dashboards and CSV downloads of their area’s real‐time and historical supply–demand data.

More More Data

Below is a survey of additional network-operation datasets—beyond simple supply/demand time series—that Japanese TSOs and OCCTO publish, especially around congestion management, line utilization, system headroom, and related operational planning.

Japan’s grid operators expose a rich set of short-term, mid-term and long-term data on congestion and network usage. You can track real-time output curtailments, forecasted power flows and headroom on major corridors, “non-firm” connection congestion rules, mid-/long-term congestion outlooks, inter-area line-utilization plans, detailed meter-level exchanges, and even the standards and Web APIs for automated retrieval.

**1. Short-Term Congestion Management & Output Curtailment**

* **TEPCO’s “系統混雑による出力制御の実施状況”**  
  Tokyo Electric publishes CSVs and PDFs showing every 30-minute interval in which congestion triggered output control on generators under its jurisdiction—both provisional (“速報”) and final (“確報”) figures for 2024 onward. [TEPCO](https://www.tepco.co.jp/pg/consignment/system/keitoukonzatu/information/index-j.html?utm_source=chatgpt.com)
* **Hokkaido Electric’s “混雑系統に関する情報”**  
  HEPCO’s portal includes both real-time congestion alerts and mid-/long-term outlooks for which local circuits may face capacity limits, with downloadable CSVs. [北海道電力](https://www.hepco.co.jp/network/con_service/public_document/bid_info.html?utm_source=chatgpt.com)
* **Congestion Management Rules (First-Come, First-Served)**  
  Under current ANRE policy, non-firm connections are curtailed on a “first-come, first-served” basis when lines congest, meaning later entrants face curtailment before incumbents—a practice described in re:global’s overview of Japanese grid rules. [REGlobal](https://reglobal.org/japans-electricity-sector-reforms-transition-to-next-generation-power-networks/?utm_source=chatgpt.com)
* **OCCTO “Non-Firm Connection” Congestion Management**  
  OCCTO’s official rules lay out how congestion is managed on both backbone (“基幹系統”) and local lines, defining applicable circuits, generation types, and control order. [OCCTO](https://www.occto.or.jp/grid/business/documents/NF_setsuzokuriyou_20240701.pdf?utm_source=chatgpt.com)

**2. System Headroom & Predicted Flows**

* **TEPCO’s “系統の空き容量等に関する情報” & “予想潮流”**  
  Alongside demand/supply, TEPCO publishes predicted power flows on major transmission corridors (“予想潮流”) and remaining headroom or available capacity on each line—data paused only during maintenance windows. [TEPCO](https://www.tepco.co.jp/pg/consignment/system/?utm_source=chatgpt.com)
* **Hokkaido’s System Configuration & Flow Forecasts**  
  HEPCO also offers periodic updates to its system topology and expected flows—vital for generators planning output and for retailers managing imbalance exposure. [北海道電力](https://www.hepco.co.jp/network/con_service/public_document/bid_info.html?utm_source=chatgpt.com)

**3. Mid- & Long-Term Congestion Outlook**

* **Kyushu Electric’s 2029 Congestion Forecast**  
  KYUDEN-TD publishes a “中長期見通し” showing that, under current reinforcement plans submitted to OCCTO, no significant congestion is projected through FY 2029 on core lines. [kyuden.co.jp](https://www.kyuden.co.jp/td/service/wheeling/disclosure.html?utm_source=chatgpt.com)
* **OCCTO’s Wide-Area System Planning Documents**  
  OCCTO’s “広域系統整備計画” series examines future congestion hotspots, system reinforcement needs, and cost-benefit analyses for new interconnections. [OCCTO](https://www.occto.or.jp/kouikikeitou/seibikeikaku/?utm_source=chatgpt.com)

**4. Transmission Line Utilization & Inter-Area Plans**

* **OCCTO “連系線利用計画” & Web API Spec**  
  Through its system interface specs, OCCTO provides both CSV and Web API access for planned maintenance (“作業停止計画”), inter-area line-usage plans, and real-time line-loading data exchanged among TSOs and power producers. [OCCTO](https://www.occto.or.jp/occtosystem2/kikaku_shiyou/index.html?utm_source=chatgpt.com)
* **Detailed 30-Minute Meter Exchanges**  
  Under its “30分電力量” standard, each TSO supplies retailers and generators with half-hourly import/export volumes and confirmed usage—essential for settlements and imbalance calculations. [OCCTO](https://www.occto.or.jp/system/gijutsu/kouri_ippan_renkei.html?utm_source=chatgpt.com)

**5. Protocols & Automated Data Access**

* **Business-Protocol Standards for Generation Plans**  
  OCCTO publishes EDI-based XML/CSV format standards (“発電計画等受領業務ビジネスプロトコル”) so that generators and aggregators can automatically submit their output plans and receive feedback. [OCCTO](https://www.occto.or.jp/soukaihoka/rijikai/2015/files/rijikai_57_gijiroku_5.pdf?utm_source=chatgpt.com)
* **OCCTO Web API Endpoints**  
  Beyond manual CSV download, OCCTO’s Web API spec details how to programmatically retrieve congestion info, reserve-rate block notifications, line-loading forecasts, and more—enabling automated dashboards. [OCCTO](https://www.occto.or.jp/occtosystem2/kikaku_shiyou/index.html?utm_source=chatgpt.com)

**In sum**, Japanese grid operators publish much more than raw load and supply: they surface live congestion events and output-curtailment logs, line-headroom and flow forecasts, mid-/long-term congestion outlooks, detailed meter-level exchanges, and full standards for non-firm connection and API integration. These datasets—often in CSV/API form—are indispensable for real-time operations, trading, and long-range planning.

More Data

Below is a curated list of Japanese‐specific data sources—government agencies, system operators, utilities, project developers, and research consortia—that publish information on the power grid (including renewable output, line flows, unit performance, connection status, etc.). **Most publicly available data is in MW or MWh**, and **detailed SCADA-level currents (amps) are generally not published** due to security and commercial confidentiality. For true turbine- or cable-level amp measurements you typically need direct project partnerships or research agreements (e.g. via NEDO).

**1. Government & National Statistics**

* **Agency for Natural Resources and Energy (ENECHO/METI)**  
  Publishes monthly “Electricity Survey Statistics” covering demand, generation by fuel type (including wind), and fuel consumption, with Excel/CSV downloads and metadata. [Agency for Natural Resources and Energy](https://www.enecho.meti.go.jp/statistics/electric_power/ep002/?utm_source=chatgpt.com)
* **Ministry of Economy, Trade and Industry (METI)**  
  Hosts policy pages on the FIT/FIP schemes, renewable purchase volumes/prices, and long‐term generation forecasts. [meti.go.jp](https://www.meti.go.jp/english/?utm_source=chatgpt.com)
* **e-Stat (Government Statistics Portal)**  
  Aggregates official statistics across ministries, including prefecture-level power generation (“送電端電力量”) and detailed breakdowns by technology (wind, solar, biomass). [政府統計の総合窓口](https://www.e-stat.go.jp/en?utm_source=chatgpt.com)

**2. OCCTO & Transmission System Data**

* **OCCTO (Organization for Cross-regional Coordination of Transmission Operators)**  
  – Publishes **area** and **wide-area block** demand & supply at 30-min and 1-hr resolution [isep-energychart.com](https://isep-energychart.com/en/1084/?utm_source=chatgpt.com)  
  – Provides **renewable output** (wind & solar generation and curtailment figures) by area/block in PDF/CSV via its Market Systems portal (see “再生可能エネルギー発電設備の接続・申込情報”). [環境省](https://www.env.go.jp/content/900449388.pdf?utm_source=chatgpt.com)
* **OCCTO Web API**  
  Offers programmatic access (JSON/CSV) to line-flow forecasts, congestion status, and reserve-rate notifications. [Ember Energy](https://ember-energy.org/app/uploads/2024/10/Asian-Data-Transparency-Report.pdf?utm_source=chatgpt.com)

**3. Regional Utilities (“でんき予報” Portals)**

All ten regional utilities mirror TEPCO’s model, publishing 30-min CSVs of area demand/supply broken down by generation type—including wind output (“風力発電実績”) and curtailment (“風力出力制御量”).

* **Tokyo Electric Power Co. (TEPCO “でんき予報”)**  
  – **Area Supply-Demand** CSV with columns for nuclear, coal, LNG, hydro, solar, wind output & control [tepco.co.jp](https://www.tepco.co.jp/forecast/html/area_jukyu-j.html?utm_source=chatgpt.com)[tepco.co.jp](https://www.tepco.co.jp/forecast/html/area_data-j.html?utm_source=chatgpt.com)  
  – **Unit-Level Generation** for ≥100 MW plants, updated daily (~15 :00 JST for two days prior) [tepco.co.jp](https://www.tepco.co.jp/forecast/html/unit-j.html?utm_source=chatgpt.com)
* **Hokkaido Electric Power (HEPCO)**  
  CSV downloads of Hokkaido-area supply–demand results, updated monthly and daily forecasts; includes wind in “需給実績” datasets. [北海道電力](https://www.hepco.co.jp/network/con_service/public_document/supply_demand_results/index.html?utm_source=chatgpt.com)[denkiyoho.hepco.co.jp](https://denkiyoho.hepco.co.jp/?utm_source=chatgpt.com)
* **Shikoku Electric Power T&D**  
  “でんき予報” portal providing CSVs for current‐day and next‐day forecasts, with a “広域ブロック” view covering wind & solar control outlooks. [四国電力](https://www.yonden.co.jp/nw/denkiyoho/index.html?utm_source=chatgpt.com)

*(Similar ports exist for Tohoku, Chubu, Hokuriku, Kansai, Chugoku, Kyushu, Okinawa.)*

**4. Offshore Wind Developers & Industry Associations**

* **Japan Wind Power Association (JWPA)**  
  Annual reports with cumulative installed capacity by prefecture and by technology (onshore vs. offshore); not real‐time but authoritative project lists. [jwpa.jp](https://jwpa.jp/en/?utm_source=chatgpt.com)
* **Akita Offshore Wind Corporation (AOW)**  
  Developer portal for Noshiro and Akita Port projects; construction records, but no public SCADA feeds. [aow.co.jp](https://aow.co.jp/en/?utm_source=chatgpt.com)
* **Eurus Energy Japan**  
  Press releases on Tokoro-Notoro and Ashikawa farms (turbine specs & capacity), yet no open performance API. [eurus-energy.com](https://www.eurus-energy.com/en/release/press-release/89533/?utm_source=chatgpt.com)
* **JERA**  
  Japan’s largest generator publishes renewable MW capacity and CO₂/emissions metrics (annual CSV/Excel). [JERA](https://www.jera.co.jp/en/sustainability/data/e?utm_source=chatgpt.com)

**5. Research & Demonstration Data**

* **NEDO Offshore Wind Measurement Guidebook**  
  Provides guidelines for measurement campaigns (wind, wave, SCADA parameters) at Japanese offshore sites—key for research collaborations. [nedo.go.jp](https://www.nedo.go.jp/english/ZZFF_00002.html?utm_source=chatgpt.com)
* **J-Stage / JWEA Symposia**  
  Proceedings (e.g. Volume 44) include papers on wake analysis and SCADA-based measurement studies at Tsugaru. [J-STAGE](https://www.jstage.jst.go.jp/browse/jweasympo/44/0/_contents/-char/en?utm_source=chatgpt.com)
* **MDPI: Failure-rate Database (NEDO)**  
  NEDO-collected turbine failure & downtime stats since 2004, useful for availability and performance benchmarking. [MDPI](https://www.mdpi.com/1996-1073/14/12/3528?utm_source=chatgpt.com)

**6. Commercial & Global Databases**

* **4C Offshore**  
  Global offshore wind database with project pipelines, port/cable info—covers Japanese projects but requires subscription. [4C Offshore](https://www.4coffshore.com/windfarms/?utm_source=chatgpt.com)
* **TheWindPower.net**  
  Commercial platform offering raw stats (turbine counts, hub heights, commissioning dates) downloadable by country/region. [thewindpower.net](https://www.thewindpower.net/index_en.php?utm_source=chatgpt.com)
* **Global Energy Monitor**  
  Open dataset (Global Wind Power Tracker) listing Japanese project phases & capacities, not SCADA-level. [4C Offshore](https://www.4coffshore.com/windfarms/japan/noshiro-port-japan-jp30.html?utm_source=chatgpt.com)

**Bottom line:**

* **Publicly**: You can access **area-aggregated** wind output (MW) and curtailment via OCCTO & “でんき予報” CSVs.
* **Project-level**: Developers’ sites (AOW, Eurus, Orsted) give capacity specs and high-level status, but **SCADA currents (amps)** aren’t published openly.
* **Research access**: NEDO and university collaborations are the primary routes to obtain **SCADA-level** sensor streams (voltages, currents, RPMs).

For **ampere-level** data you’ll generally need **direct** data‐sharing agreements (e.g. under NEDO demos or utility R&D partnerships), as Japanese grid operators and developers treat such SCADA feeds as **non-public**.