

MEETING ELECTRICITY DEMAND GROWTH IN JAPAN WITH CLEAN ENERGY

Artificial intelligence (AI) is transforming electricity demand in Japan. The Organization for Cross-regional Coordination of Transmission Operators (OCCTO) in Japan now forecasts peak demand from data centers and semiconductor facilities will grow from 560 megawatts (MW) in 2025 to 7,150 MW in 2034, and nationwide peak demand is expected grow 0.4% annually. This marks a dramatic shift for Japan, where electricity demand has been flat or declining for the past 20 years. Meeting this demand — and the clean energy needs of the industries driving it — requires innovative and proactive engagement and solutions from energy policymakers, grid operators, and clean energy buyers.

Electricity demand growth is an economic and energy transition opportunity for Japan that aligns with the country's [Green Transformation \(GX\) Vision](#) and [Seventh Strategic Energy Plan](#), which targets 60–70% clean power generation by 2040. Access to abundant and low-cost clean electricity is essential to effectively compete for AI and semiconductor investment and the reshoring of advanced manufacturing jobs. Japan plans to invest [JPY 10 trillion](#) (USD \$65 billion) by 2030 to increase its semiconductor and AI-related technology sector. To transition to a carbon emissions-free energy economy, Japan plans to mobilize JPY 150 trillion (USD \$1 trillion) in public-private investment through the [GX Promotion Act](#).

Public-private collaborative efforts with initiatives led by Japan's government, such as the [Watt-Bit Collaboration](#), encourage geographical diversification of new investments to places where the grid is less constrained. Japan's GX Bonds mobilize public-private investment to finance the energy transition and could further help accelerate clean energy integration in the near term by prioritizing funding for grid reinforcement and renewable resource projects, including solar plus storage, onshore wind, and geothermal.

Energy buyers, including those that contribute to the digital economy, can help accelerate Japan's carbon emissions-free energy transition. However, [supply of cost-effective clean energy](#) for those buyers in Japan is limited by [high installation costs](#), grid congestion, and constrained siting and permitting. With the expected surge in electricity demand in the years ahead, CEBA's members are bringing innovative solutions to meet the challenges of planning for AI-related demand growth and corporate clean energy commitments.

Building on [recommendations](#) CEBA published last year, we offer these solutions for consideration in meeting Japan's electricity load growth with carbon emissions-free energy:

Effectively integrate corporate clean energy commitments and electricity demand growth into transmission planning to enhance load forecasting and grid reliability.

- The Agency for Natural Resources and Energy (ANRE) should require OCCTO to collect comprehensive data on commitments that reflect current and future corporate clean energy procurement plans. This can be supported by:
 - Collaborating with CEBA and/or business coalitions in Japan on a corporate demand study or purchasing data on corporate clean energy targets and historic procurement from entities such as Wood Mackenzie, BloombergNEF, or the Japan Energy Hub.
 - Collaborating across ANRE and the GX Policy Group to create a voluntary data collection template and develop a stakeholder input process for all large-load projects. To address company confidentiality concerns, creating a non-disclosure agreement and secure data-sharing protocols would help.
- ANRE should establish clear guidelines for OCCTO and transmission system operators to improve accuracy and standardization of assumptions and criteria of regional and national load forecasting. The guidelines should ensure consistent forecasting to enable accurate short- and long-term planning horizons and facilitate flexible, efficient, cost-effective interregional and intraregional transmission development.

Ensure coordinated infrastructure buildout and transparent standardized interconnection queue processes for streamlined industrial and clean energy expansion.

- With increased data center interconnection queue requests, Japan's Ministry of Economy, Trade, and Industry (METI) and OCCTO should work with regional transmission system operators and large electricity buyers to develop a standardized and transparent interconnection process that tracks the status of requests with financial commitments and ensures consistent treatment across projects, to enable customers with firm commitments to bring power online in a timely manner.
- Optimize Japan's infrastructure buildout by coordinating transmission network upgrades with fiber optic buildout to support Japan's digitization and industrial goals; decentralize data center growth; and reduce siting, permitting, and deployment costs.

Enable new procurement pathways for hyperscalers to connect accelerated power demand with clean energy.

- METI should consider publishing guidance on long-term corporate power purchase agreements for all carbon emissions-free energy sources to minimize market uncertainty and support clean firm energy growth.
- Under current grid constraints, colocation can be an interim pathway to facilitate accelerated access to power. To ensure other customers' reliability and electricity costs are not harmed, ANRE in consultation with electric power utilities and larger energy buyers should develop a transparent, just, and reasonable tariff that fairly assigns network costs to colocated loads.

Unlock the potential of AI in clean energy by encouraging public-private partnership and innovation to create a competitive, prosperous, and sustainable future for Japan.

- AI can improve grid planning and interconnection queue processes as well as support the integration of distributed energy resources, manage network congestion, and enable demand response programs. Japan has made considerable progress in the digitalization of its energy systems, and further leveraging and scaling the use of AI tools could [mitigate 5–10% of global greenhouse gas](#) emissions by 2030 as new [partnership models](#) are developed and implemented globally.