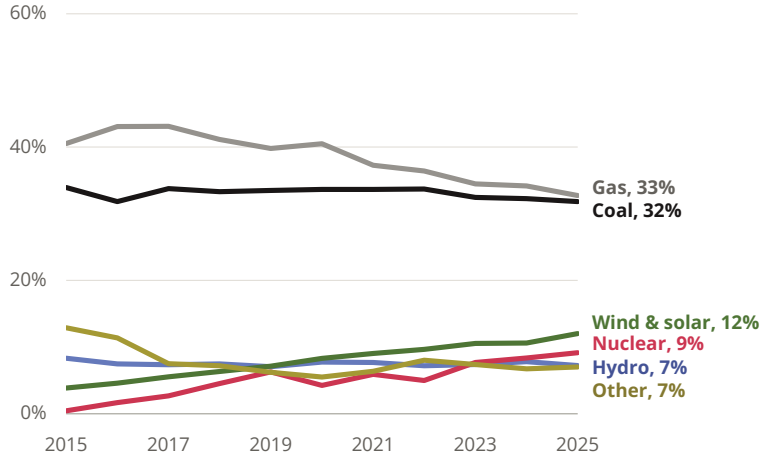
Japan at a glance

Japan's industry-led, security-driven transition puts resilience and competitiveness before rapid decarbonisation: policy backs nuclear and fossil-adjacent options, while wind and solar face grid and permitting barriers.

Key transition conditions: Import dependence gives renewables a strong security case, backed by business demand, but policy favours diversified fossil supply, and grid and permitting barriers persist.

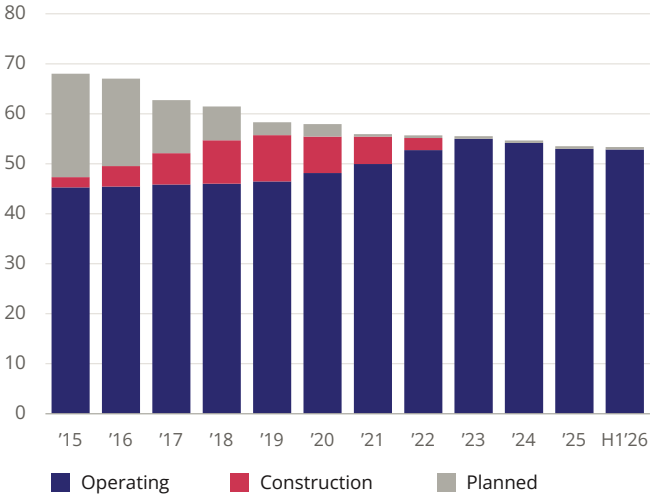
Electricity generation by source

2015–2025

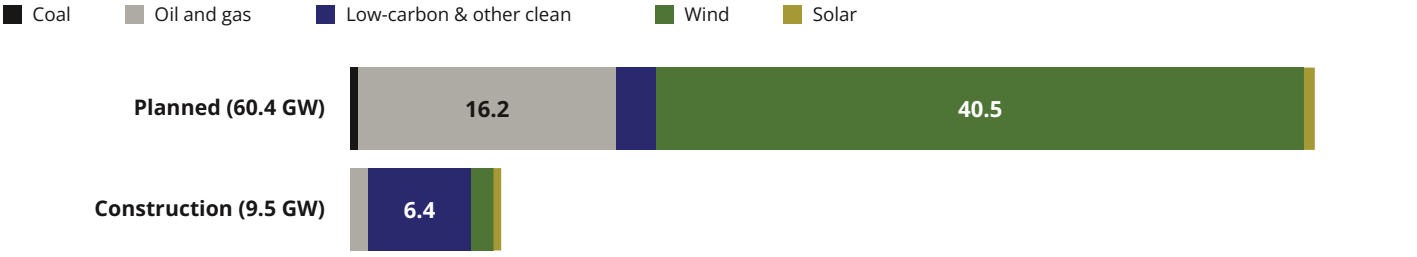


Coal capacity by status

GW, 2015–H1 2026



Capacity under development by source



Coal 0.5, Low-carbon & other clean 2.5, Solar 0.7 GW (planned) · Oil and gas 1.2, Wind 1.4, Solar 0.5 GW (construction)

Power system landscape

Over two-thirds of electricity comes from fossil fuels: about a third each from coal and gas, almost all imported. Net imports were **87.4%** of energy supply in 2024. Japan is the only G7 country without a coal phase-out date.

Clean transition trends

Target of **60–70%** non-fossil power by 2040, without the policies yet in place to reach it. Wind is just over 1% of the mix, and support for large-scale solar has ended. Almost 18 GW of new gas capacity is being built.

Enablers and bottlenecks

63% of businesses say renewables would improve energy security, and Japan has the largest national group of RE100 companies. Yet thermal plants are exempt from curtailment below 30–50% of output, and land-use rules raise costs.

Opportunities for international cooperation with *Japan*

- **The renewables shift can be framed as Indo-Pacific security** through strategic dialogues, critical mineral diversification and credible supply chain standards.
- **Energy system and cybersecurity cooperation is an opening:** technical exchanges on regulatory design and smart-grid protection can make renewables a source of resilience.
- **Regional support can align security with decarbonisation:** AZEC could move closer to other initiatives, with partnerships on grids, storage and offshore wind.

Sources: *Ember annual electricity data; Global Energy Monitor annual capacity charge data and coal plant tracker data*

E3G

This country profile was produced as part of the report *Powering Across Divides – Clean energy cooperation in a fragmented world*, published November 2026. The full report is available from **https://www.e3g.org/publications/powering-across-divides-clean-energy-cooperation-fragmented-world/**

Japan's profile

Outline and domestic political economy context

Over two-thirds of Japan's electricity mix is powered by fossil fuels: roughly one-third from coal and one-third from gas – almost all of which is imported.[1] Indeed, Japan is overall very dependent on energy imports which accounted for 86.2% of Japan's total energy supply in 2025.[2] This import dependence means Japan has the lowest energy self-sufficiency rate among the G7, and supply security underpins the country's strategic energy plan. The remaining third of electricity comes from clean energy resources. Japan is targeting 60–70% non-fossil power by 2040, but the policy and regulatory environment is not yet in place to achieve it.

Japan's heavy dependence on imported coal, oil and gas is costly, especially given that it is one of the most vulnerable countries in the world to disruptions at maritime chokepoints. Between 2010 and 2022, Japan spent 3% of its GDP annually on fossil fuel imports.[3] This is eating into export revenue: in 2023, roughly ¥26 trillion (US$185 billion) – a substantial share of earnings from exports, such as automobiles and semiconductor equipment – went towards importing crude oil and gas.[4] It is also feeding inflation: rising energy costs have weakened the yen, which hit a 40-year low in July 2026,[5] widening the trade deficit[6] and making imports still costlier as the currency falls. Meanwhile, 95% of crude oil imports flow through both the Strait of Hormuz and the Strait of Malacca.[7] Japan's overall chokepoint exposure is assessed as medium to high – on a par with the EU but higher than South Korea, China and Singapore, placing it among the countries most acutely exposed to disruptions at key maritime routes.[8] Faced with disruption at the Strait of Hormuz, Japan's response has been to draw on its extensive

[1] Ember, **Electricity Data Explorer** (webpage, accessed 06 August 2026)
[2] IEA, **Japan** (webpage, accessed 06 August 2026)
[3] The Climate Group, June 2024, **Japan's energy security opportunity**
[4] Government of Japan, February 2025, **Strategic Energy Plan**
[5] Reuters, August 2026, **Japan's executives call for FX stability as weak yen intensify import-cost pressure**
[6] The Japan Times, July 2026, **Japan's trade deficit widens as yen and Iran war inflate imports**
[7] Energy Institute, June 2026, **2026 Statistical Review of World Energy**; E3G, March 2026, **Chokepoints: A systemic threat to energy security for oil and gas importers**
[8] E3G, June 2026, **Japan's Fossil Fuel Supply Faces Unavoidable Chokepoint Risks: Reducing Fossil Import Dependence Is Central to Japan's Long-Term Energy Security**

stockpiles and diversify crude oil and LNG sourcing – securing physical oil supply through to March 2028,[9] though this does not shield it from international price volatility.

Decarbonisation gains traction when it serves industrial policy and energy security, not when it threatens affordability, reliability and industrial interests. Japanese energy policy is formally guided by the principles of "S+3E" (safety, energy security, economic efficiency, environmental protection); yet geopolitical shocks, a weak yen and rising electricity demand have pushed the first three to the fore. Stimulating growth is a key government priority, with an ambitious target of more than doubling the current growth rate to exceed 1% annual real growth;)[10] this is pursued by investing in supply chain resilience and critical sectors such as AI, advanced semiconductors, defence and space. This push for AI infrastructure and power-intensive semiconductor manufacturing underlies Japan's latest strategic energy plan: it anticipates electricity demand to grow through over the coming years until at least 2035 – reversing the downward trend seen since 2007 due to declining population figures and efficiency gains.[11] The Ministry of Economy, Trade and Industry (METI), favours an orderly transition that protects industry and is centred on nuclear, LNG, hydrogen/ammonia, CCS and next-generation solar; this policy sits alongside efforts to shore up Japanese energy security specifically by diversifying its fossil fuel import sources, building domestic stockpiles and also reviving nuclear power.

These priorities leave little room for conventional renewables in Japan. Prime Minister Sanae Takaichi supports as-yet commercially unviable perovskite cells over conventional solar power;[12] her government has ended financial support for large-scale solar projects, citing risks to Japan's natural environment and considering reliance on Chinese-made solar panels and cleantech supply chains as a critical national security vulnerability.[13] Wind constitutes just over 1% of the power mix,[14] despite vast potential: the IEA estimates technical potential for offshore wind to cover more than nine times of Japan's projected 2050 electricity demand.[15] –Land use restrictions have pushed up construction costs for both solar and wind, making new renewables pricier in Japan than elsewhere in the G7.

Coal remains central to heavy industry and energy security as Japan sees coal-generated thermal power as a reliable baseload to offset renewable variability.[16] Dispatch rules reinforce this: thermal plants are exempted from curtailment below 30–50% of output, giving them priority over renewables when grid capacity is constrained.[17] Japan committed to ending new coal plant construction in 2023 but remains the only G7 country

[9] The Japan Times, July 2026, **Japan's trade deficit widens as yen and Iran war inflate imports**
[10] Reuters, June 2026, **Japan targets more than doubling real growth to over 1% in economic blueprint**
[11] Government of Japan, February 2025, **Strategic Energy Plan**
[12] Reuters, October 2025, **Japan's conventional solar stocks tumble after Takaichi victory**
[13] Reuters, December 2025, **Japan to tighten regulations on mega-solar projects to protect nature, landscape**
[14] Ember, **Electricity Data Explorer** (webpage, accessed 12 August 2026)
[15] IEA, November 2019, **Offshore Wind Outlook 2019**
[16] Ministry of Economy, Trade and Industry, June 2023, **Annual Report on Energy for FY22 (Energy White Paper 2023)**
[17] Institute for Energy Economics and Financial Analysis, August 2025, **Grid governance, utility obligation reform, and local engagement can reignite Japan's renewable energy growth**

without a fixed coal phase-out date. One pre-permit project, GENESIS Matsushima[18] – awaiting a further environmental impact assessment, would entail constructing a new 500 MW coal facility within an existing 40-year-old plant in Nagasaki. Japan is also pursuing ammonia co-firing in coal plants, targeting 20% by 2030 and 100% by 2050, despite high costs,[19] technical limitations and uncertain emissions benefits. In fact, studies suggest this could prolong coal use, raise lifecycle emissions and heighten energy security risks by depending on ammonia imports via vulnerable sea routes[20] – a concern echoed by South Korea's recent rejection of similar co-firing plans.[21]

Despite declining gas demand, Japan is building almost 18 GW of new gas capacity,[22] with METI proposing in June 2026 to build or replace 39–55 GW of LNG-fired capacity by 2040.[23] Its Long-Term Decarbonised Power Source Auction – a capacity market scheme designed to make large, capital-intensive power investments financially viable – risks locking in excessive LNG capacity based on uncertain future demand from data centres, semiconductor plants and electrification. Although demand projections for financial year 2040 range widely (0.9–1.1 trillion kWh), METI uses the upper end to justify further gas investment; this is despite LNG originally being framed as time-limited. The fourth auction (January 2027) proposes 6 GW of LNG-only capacity,[24] which is more than the 5 GW allocated to all other "decarbonised" sources combined. This risks entrenching fossil dependence and creating stranded-asset risks, rather than prioritising the flexibility and renewables a resilient transition needs.

Japan aims to position itself as a key regional energy infrastructure provider through the Asia Zero Emission Community (AZEC), launched in 2022, extending its domestic transition approach to Asia. Though framed around growth, security and emissions reductions, AZEC's emphasis on Japanese technology and exports has driven fossil fuel-related investments, raising concerns about misalignment with the region's clean energy goals.[25] These concerns have sharpened with AZEC 2.0, launched in 2026 in response to energy market turbulence: its US$10 billion POWERR Asia initiative has so far focused mainly on alternative fuel procurement and regional fossil fuel stockpiles, with clean technology not central to Japan's offer.[26]

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[18] Global Energy Monitor, July 2026, **Matsushima power station**

[19] EEFA, July 2026, **Japan's ammonia co-firing strategy constrained by cost, supply, and timing**

[20] E3G, April 2023, **Challenging Japan's Promotion of Ammonia Co-firing for Coal Power Generation**

[21] Nikkei Asia, August 2026, **South Korea to reconsider plan for ammonia use in coal plants: energy minister**

[22] Global Energy Monitor, January 2026 release, **Global Oil and Gas Plant Tracker**

[23] Agency for Natural Resources and Energy, METI, 5 June 2026, p. 6, **Long-Term Decarbonized Power Source Auction** (資料4). This proposes targeting 39–55 GW of new or replacement LNG-only generation by 2040 and notes that thermal power plants generally require around seven years of construction.

[24] METI, Agency for Natural Resources and Energy, 5 June 2026, presentation to the Electricity Stable Supply Working Group, Material 4, pp. 1–18, **Long-Term Decarbonised Power Source Auction [「長期脱炭素電源オークションについて」]**

[25] E3G, October 2025, **Getting the Asia Zero Emission Community right**

[26] The Japan Institute of International Affairs, April 2026, **Japan's Bold Moves for Energy Resilience in Asia: POWERR Asia and AZEC 2.0 Japan's New Flagship Regional Initiatives**

Summary of key domestic transition factors

- **Japan's import dependence and chokepoint exposure create a strong underlying case for energy security through diversification, which businesses increasingly see renewables as best placed to deliver**: 63% believe a renewables-based system would improve energy security.[27] Japan hosts the world's largest national contingent of RE100 companies, whose growing demand for renewable electricity is pressuring the government to accelerate grid access, land-use reform and renewable capacity growth.[28] Rising electricity demand from AI and semiconductor growth strengthens the case for expanding domestic renewable generation capacity.

- **Japan's challenges are less about the available renewable technologies than about the political and structural conditions needed to deploy them at scale.** The government's response to recent shocks has not included accelerating domestic renewables. Renewable expansion and fossil fuel phase-out are further hindered by a mix of power system bottlenecks (e.g. grid capacity and interregional transmission issues, curtailment), regulatory constraints (e.g. slow permitting processes, land-use regulations) and concerns about securing competitive clean technology supply chains.

Opportunities for international collaboration

1. **Reposition Japan's renewables shift as an Indo-Pacific security strategy.** Existing strategic and security dialogues between Japan and the wider region, can be used to collaborate on a coordinated narrative framing its shift from fossil fuels to renewables as a security priority for the wider Indo-Pacific. Japan has the expertise to coordinate regional finance, and the leadership to strengthen collective resilience against geopolitical and market disruption. Practical partnerships to diversify critical mineral dependencies, and joint work on credible supply-chain standards, could further support more resilient, distributed clean-industrial value chains across the region.

2. **Deepen energy systems and cybersecurity cooperation.** Countries with growing renewables penetration and wider regional peers could pursue technical exchanges with Japan on how robust regulatory design and smart-grid cyber protections can turn renewables into a source of resilience rather than a liability. This constructive, solutions-oriented approach can help counter deeply rooted anti-renewables narratives in Japan that emphasise the risks of dependence on Chinese-sourced clean energy components.

[27] WMBC, E3G, GRA, Public First, June 2026, **Global Business Poll: Powering Up. Business perspectives on electrification across 18 countries**

[28] RE100 is a global corporate renewables initiative, led by Climate Group, bringing together over 400 influential businesses across over 150 markets worldwide. Its members have all committed to using 100% renewable electricity in their operations by 2050 at the latest.

3. **Align international energy transition support with energy security and decarbonisation imperatives.** Japan and the international community should work closely with growing Asian economies to expand finance for the region's clean energy ambitions. Japan can strengthen AZEC alignment with other international decarbonisation initiatives,[29] and – drawing on its technological expertise – can also play a strong role in advancing partnerships in power grids, storage, energy-efficient electrification and offshore wind.

[29] E3G, **Getting the Azia Zero Emission Community right**, October 2025

ABOUT E3G

E3G is an independent think tank working to deliver a safe climate for all.

We drive systemic action on climate by identifying barriers and constructing coalitions to advance the solutions needed. We create spaces for honest dialogue, and help guide governments, businesses and the public on how to deliver change at the pace the planet demands.

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