

Japan and the electrotech revolution

Japan builds the technologies of the electric age but runs on the fuels of the past. Electrification and renewables can cut its $161 billion annual fuel import bill by three-quarters and secure its industrial future.

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EMBER

Summary

1 A global energy revolution is well under way, and Asia is at its centre.

At Ember, we call it the electrotech revolution: the transformation in how the world makes, connects and uses electricity. Solar and wind unlock cheap and home-grown power. Batteries and AI make it flexible and smart. Electric cars and heat pumps put electricity to work in new areas. Like coal and oil before it, today's energy revolution will redraw markets, industrial power and geopolitics. So, how well placed is Japan?

2 Japan has great potential to flourish in the electric age.

Japan is the world's fifth-largest electrotech exporter, home to global leaders in heat pumps, electric motors, batteries and grid equipment. Its homes and factories are more electric than those of the EU, the United States or China. And domestic sun and wind could meet its electricity demand 13 times over.

3 But it has clung to the fossil system for too long.

Public money has gone into maintaining the status quo with expensive legacy technologies like LNG, hydrogen, ammonia and CCS, while its carmakers have sold hybrids rather than electric vehicles. Since 2022, Japan has spent at least ¥13 trillion (about $86 billion) holding down fuel prices. Meanwhile, Japan has deployed little wind power, struggles with high electricity prices and has electrified more slowly than the rest of Asia.

4 Japan's exports are now at risk from its bet on fossil technology.

Global trade in fossil fuels and equipment has peaked and faces terminal decline. In 2024, Japan exported $161 billion of fossil-fuel-linked products and technologies – the same as its fossil fuel import bill. As Asia and the world rapidly electrify their transport systems and reduce LNG for electricity generation, Ember estimates these exports could fall by about $90 billion by 2035. China has leapfrogged Japan in electric vehicles and is about to overtake it in industrial electrification. As a result, Japan will see falling sales of its fossil equipment (such as petrol cars) and stranded LNG assets.

5 Japan needs to pivot fast.

If Japan wishes to remain competitive in this new era, it must make a radical shift to an electrotech strategy. That means setting electrification targets, increasing battery and flexibility deployment, moving public money and industrial policy from molecules like hydrogen and ammonia to electrotech, and building a home market for EVs so Japan's carmakers don't cede the industry to China.

6 The prize is energy security, cheaper power and stronger industry.

By deploying electrotech in transport, electricity and low-temperature heat, Japan can reduce its fossil import dependence from 86% to about 20%, cut its fossil imports from $161 billion to below $40 billion, and reduce its electricity prices. It can increase its exposure to the electrotech industries and jobs of the future, reduce the risks of stranded fossil assets and give its electrotech exports the base of a strong home market.

The global electrotech revolution

Falling electrotech costs, from solar and wind to batteries and electric vehicles, are driving electrotech's rapid global spread and ushering in the Age of Power, in which electricity becomes the main form of energy and of national strength.

The electrotech revolution is a technology revolution – the rapid rise of a cluster of superior, cheaper technologies that is rendering the old system uncompetitive. Solar panels, wind turbines, batteries, electric vehicles and heat pumps are manufactured technologies that get cheaper as they scale: each doubling of production has cut the cost of solar modules and batteries by a fifth or more. Fossil fuels, by contrast, are extracted commodities with the opposite economics. The easy reserves go first, and each new barrel costs more to reach.

The revolution is changing all three parts of the energy system. On the supply side, solar and wind are taking over the growth in electricity – offering cheaper, more secure and more plentiful power. On the demand side, electric vehicles, heat pumps and electric industrial equipment are new ways to use it. In between, batteries, digitalisation and AI connect the two, smoothing a variable supply and flexing a once-fixed demand.

Electrotech is growing fast across supply, connections and demand

Global deployment of six electric technologies, 2010–2025



Note: HVDC lines to 2022.
Sources: Ember; Energy Institute; IEA; JRAIA; Thunder Said Energy; Ember analysis

All three are growing in volume, and falling in cost, faster than the industry expected. Since 2010, global solar capacity has risen more than 50-fold, and grid batteries have gone from almost nothing to more than 200 GW. Electric cars now make up a quarter of new car sales worldwide, with sales up more than 100-fold since 2012. Over the same period, the cost of solar power and batteries has fallen by around 90% and onshore wind by over 70%.

As a result, the shift is further along than most people realise. In 2007, electricity overtook oil as the world's largest source of useful energy (a measure that strips out energy losses). It now supplies nearly two-fifths of it. In 2025, solar and wind met almost all the growth in global electricity demand, and fossil-fuelled power stopped growing. The rise of EVs has now brought road oil demand to a plateau too.

A global revolution, not just a Chinese one

China may dominate the headlines, but solar, grid batteries and electric cars are taking off worldwide. South Asia had 143 GW of solar by 2025, and Southeast Asia now has 3.4 million electric motorbikes, scooters and three-wheelers. Many emerging economies are skipping the fossil detour that Europe and the United States took and going straight to electric, much as they skipped landlines for mobile phones. More than three-quarters of Asia is now ahead of the United States, whether measured by electrification, solar share or electric car sales.

Solar, batteries and electric cars are taking off in every region

Solar and battery capacity (GW) and electric-car fleet (million) by region, 2010–2025



Note: each cell has its own scale. Developed Asia = Japan, South Korea, Singapore, Taiwan (China).
Sources: IRENA; Energy Institute; IEA; BNEF; Ember; Ember analysis

In this new world, *power* has two meanings. As we set out in *The Age of Power* (September 2026), electricity is becoming a key source of national strength. Countries that generate their own power and use it across their economies gain energy sovereignty. Countries that make electrotech capture the industries of the future. And the digital revolution only raises the stakes: AI, robots and drones are built from the same electric tech stack and need lots of electricity, so the ability to make electrotech and power is becoming central to economic strength and national security.

Asia is poor in fossil fuels but rich in electrotech

Nowhere is the contrast between the limits of the old world and the opportunities of the new starker than in Asia: it has half the world's people, 4% of its oil and gas, and three-quarters of its electrotech factories. As Ember's *Electric Asia* (June 2026) sets out, the way forward is to deploy what it already makes to replace what it lacks. In this brief, we apply this perspective to Japan to ask where it stands in the electrotech race and what opportunities and risks it faces.

Japan and the electrotech revolution

Japan's energy system is running in hybrid mode. Its homes and factories run on electricity more than those of the EU, the United States or China, but its power stations and cars still run on fossil fuels. Oil, gas and coal generate 67% of its power and meet 83% of all the energy it uses. Almost all of these fossil fuels (99%) are imported. Japan is the world's fifth-largest electrotech exporter, but the most fossil fuel import-dependent economy in the G20. It makes many of the technologies of the future, but runs on the fuels of the past.

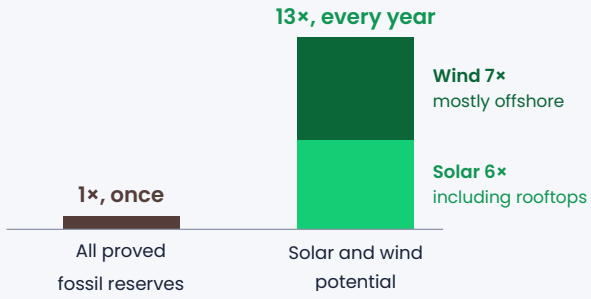
Energy resources: Japan has almost no fossil fuels, but plenty of sun and wind

Japan has almost no fossil fuels of its own. Its remaining oil, gas and coal would cover about one year of its electricity demand. Nearly all the fuel it burns is imported.

Its sun and wind are a different matter. Counting offshore wind and rooftops, solar and wind could generate 13 times Japan's electricity demand every year. Japan is more land-constrained than most countries, so it will rely more on offshore wind and rooftops. But even so, its sun and wind far outweigh its fossil fuels.

Japan's sun and wind could supply 13 times its electricity demand, every year

Domestic energy resources, multiple of annual electricity demand



Note: proved coal, oil and gas reserves, burnt for power at 40% efficiency

Sources: Energy Institute, World Bank/ESMAP and Solargis, NREL, Jacobson et al., Ember; Ember analysis

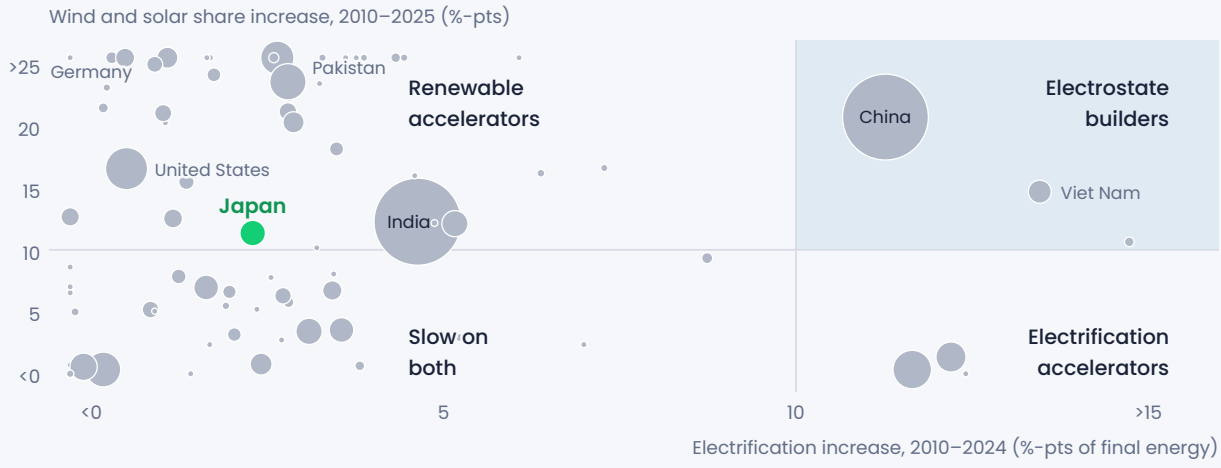
Change: Japan electrified early, then lost momentum

The electrotech revolution runs two races at once. One switches power generation to renewables. The other switches energy use to electricity. Japan has made steady progress on the first. On the second, it started well ahead of its peers, then slowed.

Wind and solar rose from 1% of generation in 2010 to 12% in 2025, fifth of 21 Asian economies. Electricity already supplies 31% of Japan's final energy, well above the EU (22%), the United States (22%) and the world as a whole (22%). But the share rose 3.5 points in the 2000s and under 2.5 points since 2010. China added 11 points over the same period and, at 29%, has almost caught up.

Japan has added wind and solar but has barely electrified since 2010

Change in electricity share of final energy against change in wind and solar share of generation, percentage points



Note: bubble size = population; values cut off at 0–25 and 0–15 points

Sources: IEA, Ember, World Bank; Ember analysis

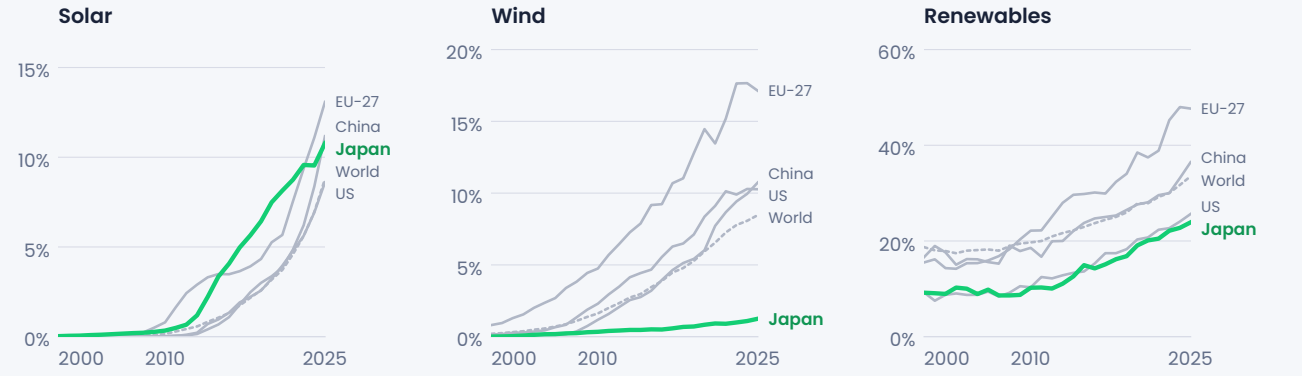
Renewables: Japan built solar at pace but has hardly begun on wind

Solar is Japan's renewable success. A feed-in tariff introduced in 2012 helped build 92 GW, and solar now supplies 11% of generation, level with China and the United States. Clean power, including nuclear, collapsed to 12% in 2012, after the Fukushima disaster of 2011. It has since recovered to 33%, but remains below the global average.

Wind lags far behind. At 1% of generation from wind, Japan trails every comparator, and offshore wind, its largest domestic resource, has stalled since Mitsubishi Corporation pulled out of three projects in 2025. Grid rules hold battery storage back: 41 GW of battery projects have applied to connect, but only about 1 GW is connected. Public money still flows the other way. A "decarbonisation" auction has guaranteed 20 years of payments to about 7 GW of new gas plants, and the first awards from Japan's ¥3 trillion (about $20 billion) hydrogen fund pay for imported ammonia to be burnt in coal plants. This is an extremely expensive energy form.

Japan built solar quickly, but progress on wind has been slow

Share of electricity generation, 2000–2025 (%)



Note: 'Renewables' includes solar, wind, hydro, bioenergy and other renewables.
Source: Ember Yearly Electricity Data; Ember analysis

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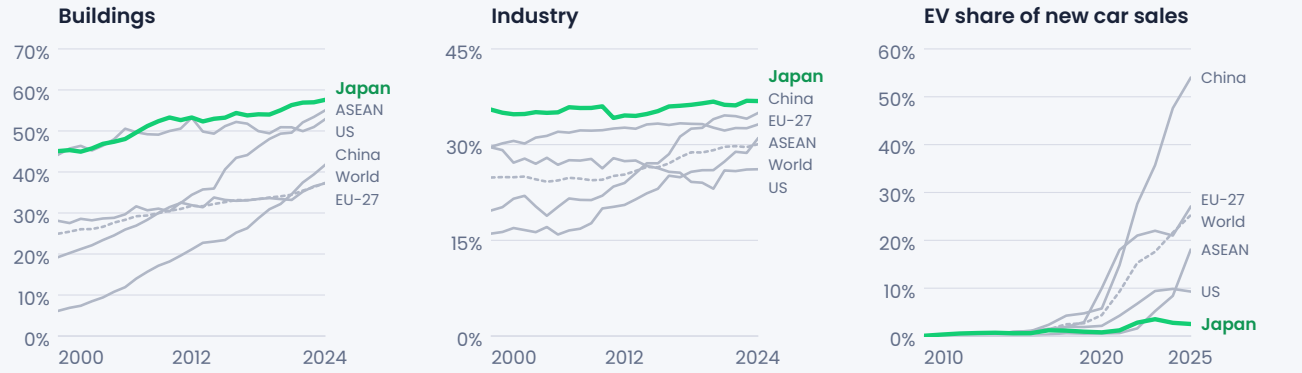
Electrification: Japan's homes and factories run on electricity, its cars on petrol

Japan's buildings and industry are impressively electric, more so than those of the EU, the United States or China. Electricity supplies 58% of the energy used in buildings and 37% in industry.

Cars are the exception. EVs (battery-electric and plug-in hybrid cars, not conventional hybrids) were 3% of new car sales in 2025, against 54% in China, 27% in the EU and 18% in Southeast Asia.

Japan's homes and factories are highly electric; its car market lags

Electricity share of final energy in buildings and industry, 2000–2024; EV share of new car sales, 2010–2025



Note: buildings = residential plus services. EVs = battery-electric plus plug-in hybrid cars.
Sources: IEA; Ember; Ember analysis

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Buildings

Heat pumps – the technology inside every air conditioner and EcoCute water heater – can finish the job of electrifying buildings. Japanese companies such as Daikin, Mitsubishi Electric and Panasonic make some of the best in the world, and they stand to gain as the rest of Asia electrifies.

Industry

Electrification, while relatively high, has hardly changed in two decades. Gas and oil still supply much of the low- and medium-temperature heat that heat pumps and electric boilers could provide.

Cars

Japan's carmakers, led by Toyota, bet on hybrids, which save fuel but still run on petrol. Hybrids took 60% of new car registrations in 2025, up from 37% in 2020, and make up 28% of its car exports by value. Meanwhile, the EV share has stayed near 3% since 2022. For the sake of its oil bill and its export markets, Japan needs to pivot quickly to all-electric cars.

Manufacturing: strong in electrotech, but exporting more than three times as much fossil fuel equipment

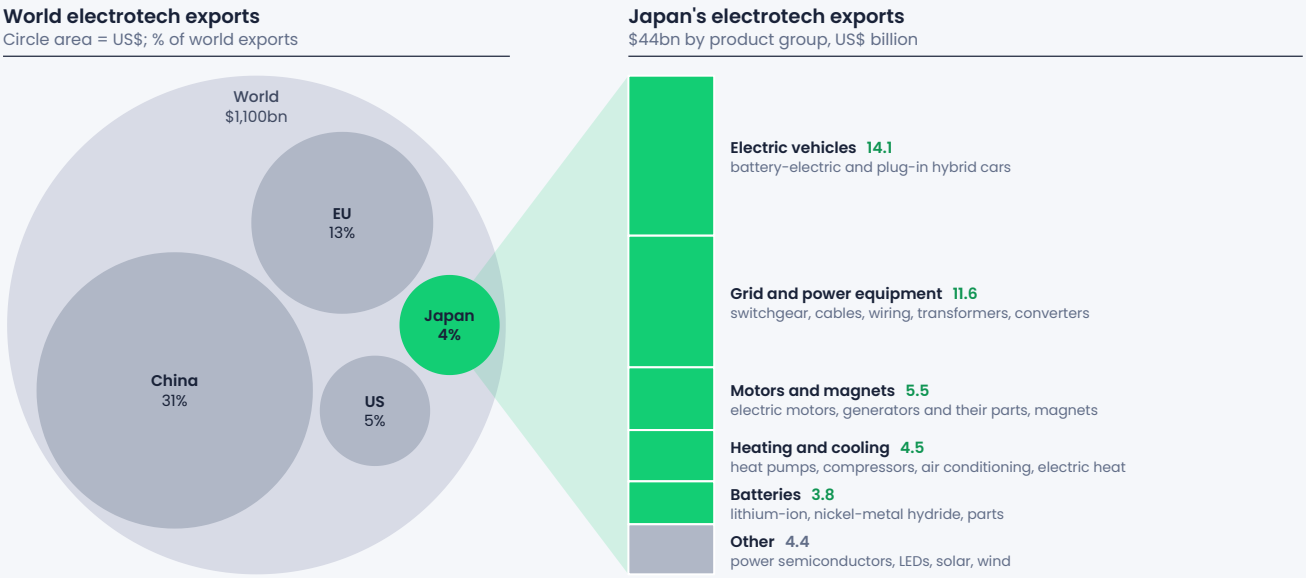
Japan is, of course, a world leader in advanced manufacturing. In 2024, it exported $44 billion of electrotech, led by electric vehicles ($14 billion) and grid equipment ($12 billion) – the fifth-largest total in the world, behind China, Germany, the United States and Mexico. It is also a top-ten exporter of IT and electronics, chips and refined minerals. Measured by how close its exports sit to each layer of the electric stack, it ranks sixth of 157 economies for electrotech and seventh for components.

Its companies lead in many areas. Murata makes about 40% of the tiny capacitors inside every phone and car, Fanuc and Yaskawa are global leaders in industrial robots, Hitachi and Mitsubishi Electric are major grid suppliers, and Daikin sells heat pumps around the world. Japan also pioneered perovskite, a thin, flexible solar cell, and is targeting 20 GW by 2040. But leadership is uneven. Panasonic's share of EV batteries has slipped to about 4% as Chinese and Korean makers scaled up, and Nidec is pulling out of EV drivetrains after heavy losses. Japan's carmakers are on the same slide. Since 2019 their share of global car sales has fallen from 31% to 26%, and their sales in China have dropped by a third. Even in Southeast Asia, long their stronghold, they are rapidly losing ground to Chinese EVs.

More widely, Japan's electrotech strength is still overshadowed by its fossil fuel equipment makers. In 2024, Japan exported $161 billion of fossil fuel kit, including $64 billion of engine cars, $30 billion of hybrids and $24 billion of engines and parts. This is the core business of Japanese carmakers Toyota, Nissan, Honda, Suzuki and their suppliers. Japan sells a quarter of the world's exported hybrids, but only 7% of its electric cars. On Ember's rapid-change scenario, in which electrotech keeps winning market share quickly, these exports could fall by about $90 billion by 2035, even if Japan holds its share of world markets. Electrotech is the other side of the ledger. If Japan holds its market share, its electrotech exports could more than double by 2035 – and grow further still if industrial policy helps it win share rather than lose it.

Japan is the fifth-largest electrotech exporter in the world

World electrotech exports by economy, and Japan's by product group, 2024 (US$)



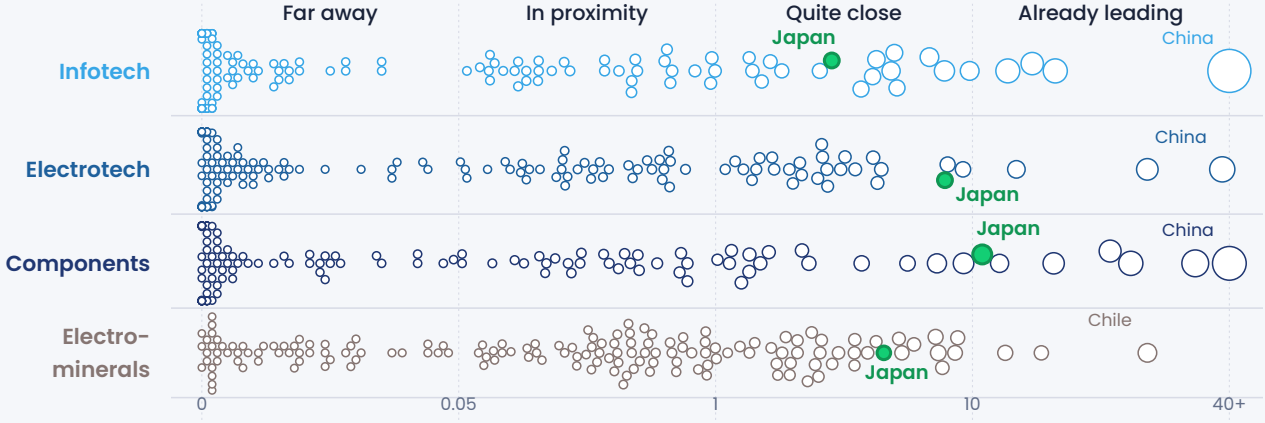
Note: exports less re-exports. EU: exports outside the EU. Product group descriptions are not exhaustive. Motors include all motor and generator parts.

Source: UN Comtrade; Ember analysis

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Japan's exports already sit close to the electric stack

Proximity of each economy's exports to each layer (index, average economy = 1); bubble size = exports in that layer



Note: 2022–24 average; layers as defined in *The Age of Power*.

Sources: Harvard Growth Lab; Ember, *The Age of Power*; Ember analysis

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Fossil dependency: Hormuz shows the cost of imported fuel

More than 90% of Japan's crude comes from the Middle East, so the closure of the Strait of Hormuz in February 2026 has hit it hard. Electrotech is the way to reduce that dependence.

The closure of the Strait of Hormuz is the world's, and Japan's, second twin fossil shock. In the 1970s, two oil crises pushed Japan into nuclear power, LNG and a national drive for efficiency. As Ember's *The New Twin Fossil Shock* (April 2026) sets out, the 2020s have brought another twin oil shock: Russia's invasion of Ukraine in 2022, and the closure of Hormuz, which removed more than 10 million barrels a day of supply, twice the loss of either 1970s shock. Yet Japan's reflex in both crises was the old playbook. In FY2022, for example, its supplementary budgets and reserve fund set aside ¥5.8 trillion (about $39 billion) to hold down petrol prices, and in FY2023 another ¥740 billion (about $4.9 billion) to subsidise power and gas bills. The all-important difference between now and the 1970s is that a suite of cheaper, mature technologies is already here, and that suite is electrotech.

A $161 billion bill, three-quarters of it replaceable today

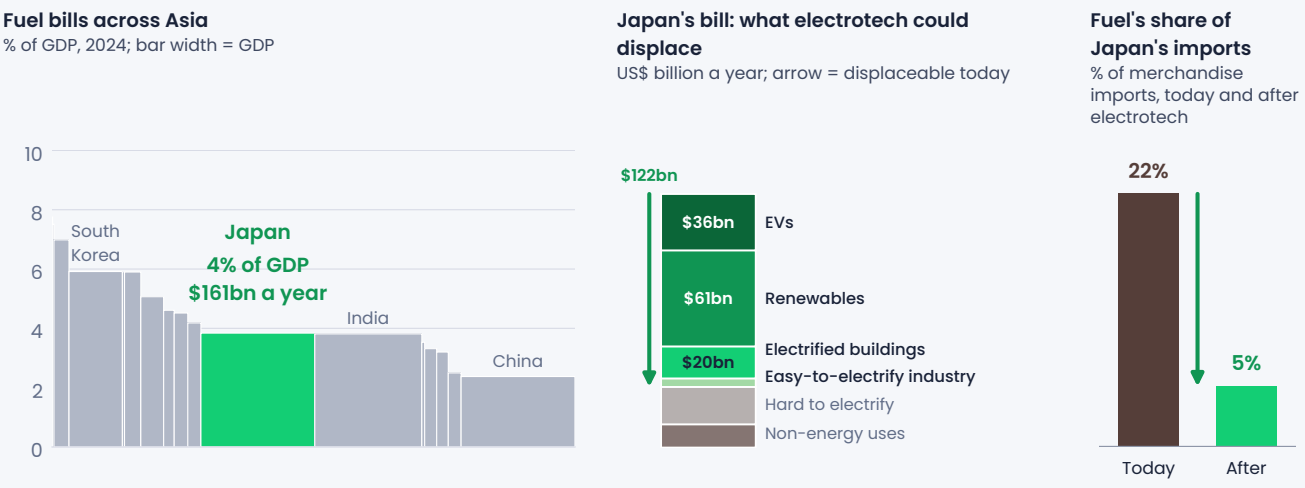
Japan's net fossil fuel imports cost about $161 billion in 2024, nearly 4% of GDP. That is about $1,300 for every person in Japan, and nearly three times what the country spends on defence. Oil and oil products cost $90 billion, LNG $41 billion and coal $30 billion.

LNG deserves particular scrutiny. After the 1970s oil shocks, Japan turned to LNG to diversify away from oil. Today, it is a $41 billion bill of its own and one of the most expensive ways to generate power: at 2026 prices, LNG-fired electricity costs more than $160/MWh, against a global average of under $60/MWh for new solar plus batteries in 2025. Yet Japan keeps signing up for more: three weeks before Hormuz closed, JERA agreed a 27-year contract for Qatari LNG that must pass through the strait. Locking in more LNG now would apply a 1970s answer to a 2020s problem – an expensive mistake when a home-grown alternative is already cheaper.

Fortunately, electrotech now makes this dependence a choice rather than a necessity. Ember calculates that around $122 billion (76%) of the import bill pays for uses that electrotech on the market today could replace. Most of it comes from three switches: renewables instead of fuel in power stations ($61 billion), EVs instead of petrol and diesel cars ($36 billion), and electric heating and cooking in buildings ($20 billion).

Electrotech could replace $122 billion of Japan's $161 billion fuel import bill

Net fossil fuel imports in 2024, and what switching to electrotech would save Japan



Note: net imports allocated to end uses in proportion to fuel demand. China's width capped for legibility. Right: net imports of coal, oil, gas and LPG over total merchandise imports, 2024.

Sources: UN Comtrade; World Bank; IMF; IEA; Ember, *Electric Asia*; Ember analysis

Importing less fuel would steady the trade balance and the yen

Fuel is a fifth of everything Japan imports – 22% of its merchandise imports in 2024. So every jump in oil or LNG prices widens the trade deficit, weakens the yen and raises prices at home. Japan may not be at risk of running out of foreign currency – a year's fuel bill equals 13% of its foreign-exchange reserves – but with today's electrotech deployed, fuel would fall to 5% of imports, steadying the trade balance and reducing inflation.

The deeper gain is macroeconomic. Money spent on imported fuel leaves the domestic economy for good, much of it flowing to producers in the Gulf. More of the money spent on electrotech stays at home, paying installers, grid builders and manufacturers, and the assets keep producing for decades. Electrotech turns a recurring wealth transfer to fuel exporters into investment in Japan's own productivity.

Even imported electrotech carries far less risk than imported fuel. Fuel is rented: it is burnt once and must be bought again every year, through choke points such as Hormuz. Electrotech is owned: a solar panel installed today keeps generating for decades, even if the next shipment never comes. One container ship of solar panels, costing about $45 million, generates as much electricity over 20 years as the gas from 19 LNG tankers costing $850 million in all – so solar costs about a twentieth as much in imports, paid only once.

Japan can buy its power once, or pay for fuel every year

Ships needed to generate 10 TWh of electricity in Japan – about 1% of a year's demand – and what the cargo costs



Note: a 4,500-container ship carries about 447 MW of panels (Japan's 2025 average panel), working at a 12% capacity factor for 20 years. LNG: 72,000-tonne tankers, gas plants at 54% efficiency. Coal: 80,000-tonne bulk carriers, plants at 39%. 2025 average prices: Chinese panels shipped to Japan $0.095/W, Asian LNG $12.1/MMBtu, Australian coal $112/t. Each banknote = US$50 million. LNG import bill at 2026 prices so far would amount to $1.3bn.

Sources: Ember, IEA, IMF; Ember analysis

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A SWOT: how well placed is Japan to capture the electrotech opportunity?

S Strengths

An electric industrial base

The fifth-largest electrotech exporter, a top-ten chip exporter, and world-class in heat pumps, motors and grid equipment.

Electric homes and factories

Electricity supplies 58% of building energy and 37% of industrial energy, more than in the EU, the United States or China.

No fuel of its own to protect

Japan has almost no fossil fuels: 99% of the oil, gas and coal it burns is imported, at $161 billion a year.

Cheap capital and a big budget

Among the world's lowest borrowing costs, and a ¥150 trillion (about $1 trillion) green transformation (GX) programme to spend.

W Weaknesses

A major maker of fossil fuel equipment

Japan exports $161 billion of fossil fuel equipment, more than three times its electrotech, and the companies that make it are a powerful voice against faster change.

Limited land for renewables

On restricted onshore sites, Japan's solar and wind could supply nearly seven times its current electricity demand, a smaller margin than most countries have, making offshore wind and rooftops essential.

Backing the old system

At least ¥13 trillion (about $86 billion) of fuel and energy-bill subsidies since 2022 and 20 years of payments to new gas plants, while 41 GW of batteries have applied to connect, with about 1 GW connected.

A car market stuck in hybrid mode

Hybrids take 60% of registrations; EVs are only 3%.

O Opportunities

Cut the fuel import bill by three-quarters

Today's technology could replace $122 billion of imports a year, cutting fuel from 22% of imports to 5%.

Power that is cheaper to own than to burn

At 2026 prices, power costs less than $60/MWh for new solar plus batteries; LNG power costs more than $160/MWh.

Sell to a fast-electrifying Asia

Most of Asia is now ahead of the United States, whether measured by electrification, solar or EVs. Holding its market share, Japan could more than double its electrotech exports by 2035.

Power the AI and chip boom

Data centres and chip plants need fast, clean power, and Japan already has a central role in the chip supply chain.

T Threats

Shrinking markets for fossil equipment

Japan's $161 billion of fossil fuel equipment exports could fall by about $90 billion by 2035 on Ember's rapid-change scenario.

Leapfrogged by China

China leads in batteries and EVs; Panasonic's share of EV batteries has slipped to about 4%.

Asia moves on without Japan

EVs are 54% of new car sales in China and 18% in Southeast Asia, markets Japan's carmakers depend on.

Contracts that outlast the system

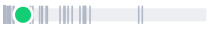
LNG is contracted to 2055, and new gas plants are paid until about 2050, costs that could be stranded as electrotech gets cheaper.

The electrotech manifesto for Japan

Electrotech lets every nation build an energy system that is abundant, affordable and local. Eight principles to make it happen – and what each means for Japan.

The playbook	Applied to Japan
1 Build the whole electric system Advance all three parts of the electrotech revolution together: supply (solar and wind), connections (grids, storage and digitalisation) and demand (electric transport, buildings and industry). Each increases the value of the others.	**Target electrification, not just renewables** Japan sets targets for its power supply but none for how much of its energy should be electric. Set an electrification target, and plan solar, wind, grids and batteries as one system to meet it.
2 Rewrite the rules for the electric age Today's energy rules were built for large power stations, passive consumers and fossil fuels. Electrotech is modular, distributed and fast-moving: permitting, grids, market design, utility incentives and taxes need rebuilding around it.	**Rewrite the grid rules** 41 GW of batteries have applied to connect and about 1 GW is connected. Connect the projects that are ready first, reward grid companies for fast connections rather than for spending, and let batteries compete in every market.
3 Put power in people's hands Electrotech changes who produces and controls energy. Make rooftop solar, batteries, heat pumps and EV chargers simple to install, and let households and businesses sell their flexibility to the grid, so the savings reach their bills.	**Let households run on their own power** Japan has a smart meter in almost every home, yet far too few households are on time-of-use tariffs, and plug-in solar is effectively illegal. Price power by the hour, make plug-in solar legal and let households sell the flexibility of their batteries and EVs.
4 Make electricity the cheap energy source Electrification accelerates when power is abundant and cheap. Shift taxes from electrons to molecules, cut the cost of capital, build grids ahead of demand, and use batteries and flexibility to lower system costs. Cheap power is both energy and industrial policy.	**Make electricity cheaper than fuel** Japan has moved the other way: it raised the surcharge on electricity, cut petrol tax and spent ¥13 trillion (about $86 billion) on fuel subsidies. Shift taxes from electrons to molecules, and move public GX money from hydrogen, ammonia and CCS to electrotech.
5 Unite the electric and digital revolutions Use AI and digital control to coordinate the electric system, and abundant electricity to power AI, robotics and automation.	**Power AI with electrotech, not gas** Japan expects about 7 GW of new data-centre and chip demand within a decade and is leaning on gas to meet it. Connect them where clean power is in surplus, on flexible terms, and use their digital capability to run a smart grid.
6 Build the industries of the future Use industrial policy to win an edge in the electro-industrial economy, from batteries and motors to power electronics, solar, grids and robots. Focus on learning-curve technologies, where scale drives costs down and capabilities up.	**Build the home market for the electric stack** Japanese firms make batteries, heat pumps and grid equipment but sell few at home: electric cars are about 3% of sales. A rising electric share of car sales, charging everywhere and electric public fleets would give them a home base to export from.
7 Exit old industries in decline Fossil fuels and the engines, turbines and boilers that burn them are shrinking markets. Plan the exit early: move capital, skills and workers into the industries of the future before the old ones strand them.	**Set the end dates** Japan's 2035 car target counts hybrids, new gas plants get 20-year contracts and LNG deals run to 2055. Set real end dates for petrol cars and coal, cap fossil contract terms, and help suppliers and regions switch before their markets shrink.
8 Navigate the new geopolitics of the electric age Strengthen security with home-grown power, electrification, electrotech manufacturing and supply chains diversified with allies. Harness the overlap with national security: the same batteries drive EVs and drones and keep grids resilient.	**Answer Hormuz with electrotech** Japan's response to the Strait's closure leads with fuel subsidies, new oil routes and nuclear. Instead, build home-grown power and electric vehicles fast to cut dependence, batteries to harden the grid, and allied supply chains for the electrotech they need.

Japan by the numbers

Metric	Unit, year	Japan among all countries (each country ● Japan ● world)	Japan	OECD	China
Economy and system					
GDP per person	$ per person, 2025		**35,951**	51,734	13,862
Energy used per dollar of GDP	megajoules per $, 2024		**2.6**	2.9	5.2
Electricity demand	TWh, 2025		**1,027**	11,410	10,486
Per person	MWh per person, 2025		**8.4**	8.1	7.5
Growth since 2010	% a year, 2010–25		**-0.8**	+0.4	+6.3
Electricity generation					
Clean power	% of generation, 2025		**33**	52	41
Solar	% of generation, 2025		**11**	9.5	11
Wind	% of generation, 2025		**1.2**	11	11
Change in wind and solar share	percentage points, 2020–25		**+3.7**	+7.3	+13
Nuclear	% of generation, 2025		**9.2**	16	4.6
Fossil power	% of generation, 2025		**67**	48	59
Electrification					
Electricity share of final energy	% of final energy, 2024		**31**	23	29
Change since 2010	percentage points, 2010–24		**+2.3**	+1.3	+11
Buildings	% of buildings' energy, 2024		**58**	47	42
Industry	% of industry's energy, 2024		**37**	33	35
Transport	% of transport's energy, 2024		**2.2**	1.1	5.2
EV share of new car sales	% of new car sales, 2025		**2.5**	16	54
Fossil fuel use					
Fossil fuels' share of primary energy	% of primary energy, 2024		**83**	77	86
Fossil fuel subsidies	% of GDP, 2024, provisional		**1.1**	0.4	0.5
Fossil exposure					
Net fossil fuel imports	% of primary energy, 2024		**86**	10	24
Fossil fuel import bill	$ billion, 2024		**161**	375	445
Share of GDP	% of GDP, 2024		**3.8**	0.5	2.4
Per person	$ per person, 2024		**1,298**	269	316
Resources					
Solar and wind potential	times annual demand, 2025		**13**	136	40
Fossil fuel reserves	years of annual demand, 2020		**1.0**	132	43
Fossil fuel production	exajoules, 2024		**0.1**	150	115
Industry and readiness					
Electrotech exports	% of world, 2024		**4.0**	56	31
Fossil fuel kit exports	% of world, 2024		**10**	79	11
Chip exports	% of world, 2024		**4.0**	29	20
Export proximity to electrotech	rank of 157, 2022–24		**6**	–	1

– = not applicable; n/a = not available. Net fossil fuel imports include fuel for international shipping and aviation. Sources: Ember (yearly data, Monthly EV sales data, *Electric Asia*, *The Age of Power*); IEA; World Bank; IMF; OECD–IISD subsidy tracker; Energy Institute; World Bank/ESMAP and Solargis; NREL; Jacobson et al.; UN Comtrade; Harvard Growth Lab. Policy and company details: Ember desk research (July–October 2026).

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About Ember

Ember is an independent energy think tank that aims to accelerate the clean energy transition with data and policy. It creates targeted data insights to advance policies that urgently shift the world to a clean, electrified energy future.

ember-energy.org

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Cover image

Mount Fuji behind power lines and transmission towers.

Credit: Railgun Breaker / Pexels.

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