

Japan's transition bonds

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The International Capital Market Association (ICMA) published new guidelines in November 2025 introducing a standalone Climate Transition Bond (CTB) label with clear definitions, safeguards, and examples to support credible transition projects. As a use-of-proceeds instrument, ICMA aligned-CTBs include safeguards to ensure fossil-related investments align with transition objectives. The new label aims to enhance market transparency, particularly for high-emission sectors undergoing decarbonization. While transition bonds remain limited in Europe and elsewhere, they have been a notable part of Japan's transition finance landscape since 2021.

The Japan transition bond market stands at JPY5.37 trillion (USD35.8 billion) currently[1], mainly comprised of the government's Japan Climate Transition Bonds (JCTBs) (JPY3.9 trillion), with the remainder coming from corporates. There are 97 corporate transition bonds, of which roughly 50% outstanding from the utility/power sector. We conduct an analysis of the JCTB and utility/power transition bonds to show how transition finance proceeds are utilised after issuance. This will improve understanding of the progress of Japan's national green transformation strategy and the potential consequences for bond investors.

Key Takeaways

- **ICMA's new Climate Transition Bond Guidelines shift global attention to transition bond financing where Japan has been a first mover, issuing over USD35 billion of transition bonds to date.**
- **Japan showcases how an economy-wide transition finance framework can connect policy and capital markets to drive energy and industrial transformation.**
- **Japan Climate Transition Bonds are one of the first ICMA-aligned CTBs already trading in the market with proceeds prioritising the battery and nuclear industries.**
- **Power-sector transition bonds where Japan's utilities dominate are broadly aligned with ICMA process standards, but only partially aligned with CTB project criteria.**

[1] Data sourced from Bloomberg Finance L.P. 13 Feb 2026.

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Navigating Market Volatility: JCTBs

In May 2023, the Japanese government launched its Green Transformation (GX) strategy to reduce fossil fuel dependence by promoting decarbonised power. This was to be financed via GX transition bonds, with a goal of attracting over JPY150 trillion of public-private investments over 10 years. The GX2040 Vision, approved by the cabinet in February 2025, is a long-term strategy for achieving this transformation and is integrated with Japan's 7th Strategic Energy Plan (SEP).[2] SEP sets the energy mix while GX policy helps finance and industry execute the transition. The plan will also introduce carbon pricing, including a surcharge on fossil fuel supply from FY28, and a GX-ETS emissions trading system beginning this year.

The Japanese government has been issuing JCTBs, also known as GX transition bonds, since February 2024. The target JCTB issuance is JPY20 trillion over the next 10 years. As of February 20, 2026, seven JCTBs totalling JPY3.9 trillion have been issued. Notably, the JCTB bond issuance framework was recently endorsed by its second opinion provider, JCR, which confirmed its alignment with ICMA's new guidelines. **JCTBs are one of the first ICMA-aligned CTB issues already trading in the market.** We expect the new ICMA guidelines to increase interest in CTBs globally, raise the profile of JCTBs, and help attract a wider international investor base.

Table 1. JCTB bonds issued, FY23-YTD FY2025. Source: Bloomberg Finance L.P., accessed Feb 20, 2026.

ISIN	Issuer Name	Issue Date	Cpn (%)	Amt (USD Bn)	Maturity	Series	Crncy	Bid/ Cover(*)	BOJ owned
JP1480011Q23	Japan Govt 10-Yr Bond	15/2/24	0.7	799.5	20/12/2033	1	JPY	2.90	42.10%
JP1470011Q24	Japan Govt 5-Yr Bond	28/2/24	0.3	799.8	20/12/2028	1	JPY	3.39	40.14%
JP1480021Q54	Japan Govt 10-Yr Bond	29/5/24	1	699.6	20/3/2034	2	JPY	3.31	39.57%
JP1470021Q71	Japan Govt 5-Yr Bond	19/7/24	0.5	699.4	20/6/2029	2	JPY	3.19	39.06%
JP1470031R78	Japan Govt 5-Yr Bond	16/7/25	1	299.8	20/6/2030	3	JPY	3.98	15.44%
JP1480031RA4	Japan Govt 10-Yr Bond	22/10/25	1.6	299.8	20/9/2035	3	JPY	3.56	6.10%
JP1470041S18	Japan Govt 5-Yr Bond	26/1/26	1.6	299.9	20/12/2030	4	JPY	3.49	NA

**Bid/Cover ratio refers to the total value of bids received/total value of securities offered and shows the demand.*

The JGB market has seen heightened volatility since last year, with a sell-off on the super-long end spilling over to the rest of the curve, including the 10 year. The bond market has struggled to find its footing amidst a weakening yen and higher inflation expectations — especially for food and consumer staples — and because of a perceived lack of fiscal discipline under the country's new leadership. On January 20, 2026, the JGB market experienced a seizure, as 30 year and 40 year JGB yields spiked more than 25bps on limited trading volume. It was noted by market participants that only USD170 million of 30 year bonds and USD110 million of 40 year bonds changed hands on the day.[3] On February 8, Prime Minister Takaichi secured a decisive two-thirds victory in the lower house of the legislature following snap elections. More volatility is expected as markets assess Takaichi's policies. The new administration is signalling that it will be market friendly by

[2] 7th Strategic Energy Plan is the national energy strategy which sets Japan's energy mix and policy direction for FY2040.

[3] "Japan Bond Wipeout Was Triggered by Just $280 Million of Trading", Bloomberg.com, 22 Jan 2026.

introducing a temporary food tax cut, focusing on refundable tax credits, and holding off on new deficit financing bonds. However, the key risk is renewed fiscal policy looseness. The Bank of Japan (BOJ) is expected to continue with rate hikes this year, which will raise JGBs yields in the short and medium segments of the curve.

Amidst this heightened volatility, the government has to continue funding the climate transition bonds to realise its decarbonisation and energy transformation objectives. Bid/cover ratios of the JCTBs from FY25 onwards have ranged between 3.2 and 4 times subscribed. Importantly, the 5 year JCTB issued on Jan 26 received a decent bid/cover ratio of 3.49 times, even after the chaotic market moves in the JGB market the week prior.

Figure 1. JCTB spreads relative to regular JGBs. Source: Bloomberg Finance L.P. accessed 20 Feb 2026.

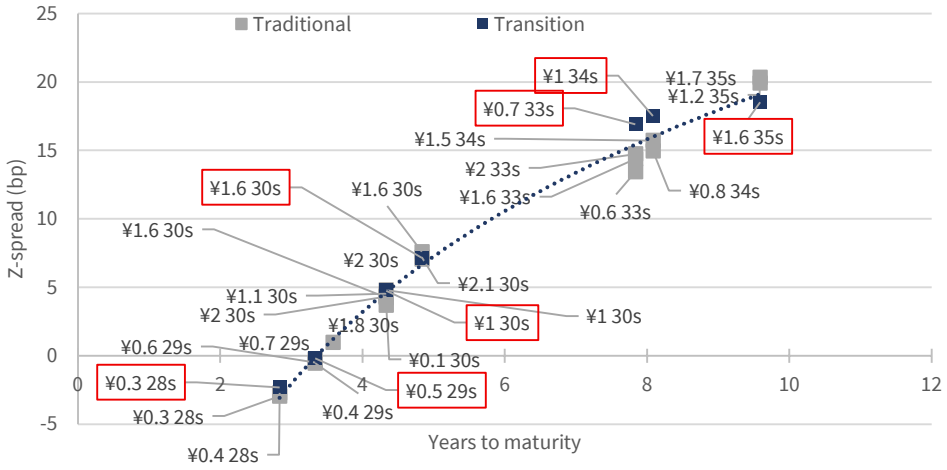


Figure 2. Greeniums of JCTBs since issuance. Source: AFII, Bloomberg Finance L.P., accessed 20 Feb 2026.

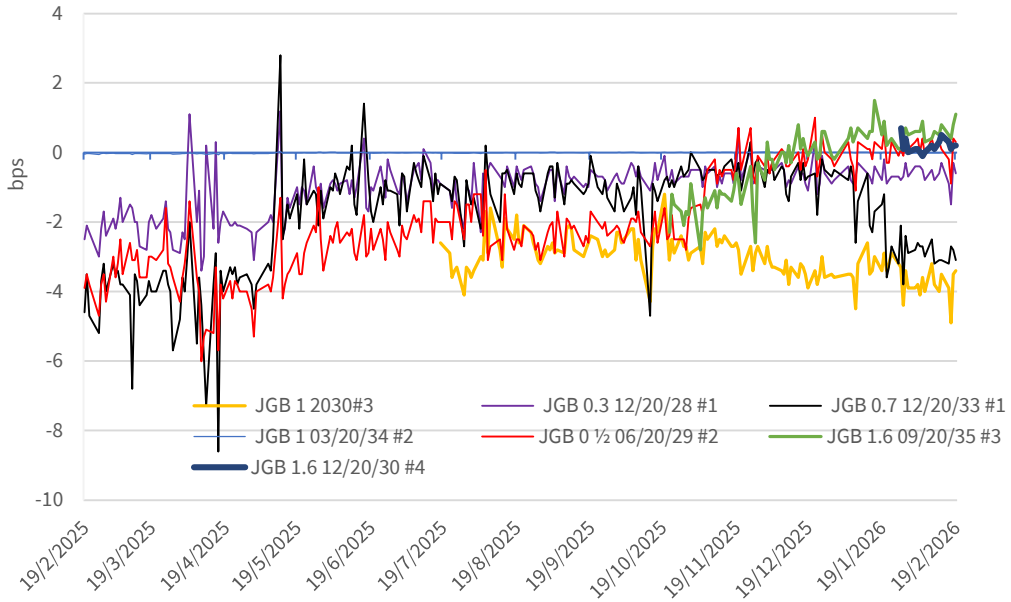


Figure 1 above shows that JCTBs mostly trade in-line with their JGB counterparts. Currently, the 0.7% 2033 and 1% 2034 are outliers, trading 1-2bps wider than the regular JGBs of equivalent tenor. The greeniums for the JCTBs have varied over time and have been different depending on the bond (See Figure 2). In a past paper we provided observations on JCTBs' trading patterns

relative to regular JGBs, attributing some of the challenges of trading liquidity in the former market to smaller issue size and substantial BOJ holdings.[4]

JCTB planned use of proceeds

Allocation (and planned allocation) of proceeds from JCTBs so far have prioritised projects focused on materials and product supply chains and GX technologies such as batteries and nuclear technologies. Japan's strategy is focused on building an industrial base to foster new growth businesses while pursuing decarbonisation as a secondary objective, giving lower priority to areas like clean transportation and clean energy.

Table 2 below summarises the country's key transition projects. Figures reflect allocations of bond proceeds from the FY2023 Allocation Report and budgeted allocations from the JCR evaluations for FY2023–FY2025. Budgeted allocations often exceed actual bond proceeds and are revised annually. Due to disclosure limits, budgeted data for FY2024–2025 and actual data for FY2022–2023 are used. This provides insight into intended spending categories, benchmarked against the Ministry of Economy Trade and Industry's (METI) projected investment measures outlined in its June 2025 policy report.[5]

Table 2. FY22-25 Estimated use of proceeds for JCTBs issued, compared with METI's targeted 10yr public/private investments. Source: Allocation Report for FY2023 Japan Climate Transition Bond, JCR evaluation results, METI June 2025 Reference Materials for the 4th Report of the Committee on New Direction of Economic and Industrial Policies.

	Fiscal Year						
(JPY bn)	2022	2023	2024	2025	22-25 Total	Targeted 10yr Public/Private Investment	% of targeted
Semiconductor/AI	227.3	308.7	157.6	179.7	873.3	~12,000.0	7%
Storage Battery	331.6	318.0	682.1	15.0	1,346.7	~7,000.0	**19%**
Clean energy	17.5	9.5	60.8	81.0	168.8	~31,000.0	1%
Nuclear		12.4	56.3	88.9	157.6	~1,000.0	**16%**
Clean transportation	101.6	177.8	187.0	46.1	512.5	~42,000.0	1%
of which autos (subsidies)	69.0	177.8	150.0		396.8	~34,000.0	1%
Manufacturing decarbonisation	336.4	107.2	41.2	151.6	636.4	~8,000.0	**8%**
Hydrogen	16.0		8.9	41.4	66.3	~7,000.0	1%
Buildings/housing	90.1	204.1	243.0	24.4	561.6	~14,000.0	4%
GXAA			120.0	70.0	190.0		
Startups	49.6		41.0	30.0	120.6		
Others		3.3	5.0	5.0	13.3		
Total	1,170.1	1,141.0	1,602.9	733.1	4,647.1		

Storage batteries, nuclear, and manufacturing decarbonisation stand out in terms of allocation of proceeds relative to targeted investments. In September 2024, METI approved a fund of up to JPY348 billion for electric vehicle (EV) battery production, to build out 150Gwh/yr of domestic output capacity by 2030. This strategy is designed to reduce dependence on foreign battery supply chains. METI provided a list of 12 projects to be subsidised, including a lithium-ion (Li-ion) battery cell production led by a consortium of battery producers, Panasonic, and auto manufacturer Subaru.[6] This Panasonic/Subaru initiative is slated to receive the largest portion — JPY156.4 billion — which would cover about 34% of its total project cost. It is expected to start

[4] "Latest 5yr JCTB auction receives warm reception despite market volatility", AFII, 18 Jul 2025.
[5] "Reference Materials for the Fourth Report of the Committee on New Direction of Economic and Industrial Policies", Ministry of Economy, Trade and Industry, Jun 2025.
[6] "Japan approves $2.4bn for EV battery projects", Argus Media, 6 Sep 2024.

supplying components by August 28. The support for the battery industry underpins the country's EV industry and power system, both are which are essential to meeting its net zero targets.

Manufacturing decarbonisation includes using hydrogen in iron and steelmaking, where it partially replaces coking coal in the production process. It also involves hydrogen and ammonia co-firing with gas in industrial furnaces — a set of technologies now attracting investment. These projects are expected to reduce peak power consumption by 30% or more by FY2031.[7] These types of technologies are listed as approved projects under ICMA's new guidelines for CTB use of proceeds, under "Circular economy adapted products, production technologies and processes".

For climate transition projects involving fossil fuel assets, safeguards are needed to ensure the credibility of associated transition bonds. These include: 1) asset-level transition plans; 2) timebound phase-out or fuel switching; 3) forward-looking reporting; 4) supportive low-carbon investments; 5) limits on capacity expansion or life extension; and 6) commitments to deploy Carbon Capture, Utilisation, and Storage (CCUS). The 2023 Allocation Report provides some details on long-term emissions reductions, with measurable impacts beginning in the early 2030s. Please refer to Table 4 in the Appendix, which summarises these impacts.

As the GX2040 vision is closely linked to the 7th Strategic Energy Plan, the 2040 power mix targets are key: 40-50% renewables, 20% nuclear, and 30-40% thermal (fossil fuels). This is compared to the 2024 power mix of 68.5% thermal (fossil fuels), 32% renewables, and 8.3% nuclear.[8] This shift implies a stronger focus on nuclear power, hydrogen/ammonia, and CCUS technologies. Renewables would still need to grow, although less urgently given the interim target of 38% renewables by 2030. Therefore, it is no surprise that the initial spending outlays would be concentrated in nuclear projects and manufacturing decarbonisation projects.

Power sector issuance

Overview and instruments type

Japan's power and gas utility sector has been the most active corporate segment in the domestic transition bond market since 2021. The companies we analysed have issued more than 40 transition-labelled bonds across 11 issuers, with cumulative issuance of approximately JPY821 billion, representing around half of domestic corporate transition bond volumes. This reflects the central role of the power sector in Japan's transition finance framework and its close alignment with METI's sector-specific roadmaps.

Transition-labelled issuance from Japan's utility sector falls into two distinct structures. Transition bonds (use-of-proceeds) allocate capital to defined eligible projects and require allocation reporting. In contrast, Transition-Linked Bonds (TLBs) link bond characteristics to issuer-level decarbonisation targets without ring-fencing the proceeds. Both structures are recognised under Japan's transition finance guidance and are used in parallel to support different dimensions of the power-sector transition.

[7] "Japan Climate Transition Bond Framework- Affirmation", JCR Sustainable Evaluation, 19 Jan 2026.
[8] "Ember: Japan", Ember, accessed 11 Feb 2026.

Alignment to ICMA Climate Bond Transition Guidelines

Most Japanese utility transition bonds were structured before ICMA published the Climate Transition Bond Guidelines (CTBG) in November 2025.[9] They instead reference the ICMA Green Bond Principles (GBP) and the Climate Transition Finance Handbook (CTFH) at the framework level. The Climate Transition Finance Handbook[10] provides issuer-level guidance focused on transition strategy, governance, targets, and disclosure, whereas the CTBG details issuance-level expectations for use-of-proceeds bonds financing Climate Transition Projects, including safeguards and treatment of carbon lock-in risk.

Table 3 shows that process alignment with ICMA standards is generally strong across issuers. Frameworks consistently reference GBP and CTFH, and allocation reporting is in place across the sample. The CTBG, however, was not explicitly incorporated at issuance for most of the bonds reviewed. CTBG alignment is therefore assessed retrospectively, using a principles-based evaluation of whether disclosed use-of-proceeds categories align with credible sectoral transition pathways and whether safeguards are conceptually addressed.

Table 3. Japanese Power and Gas Utilities: Transition Bonds, ICMA Framework Alignment and CTBG Mapping. Source: ICMA, Issuers' reports, AFII analysis.

Issuer	Notional amount issued (JPY bn)	Framework alignment with ICMA	Use of proceeds (as disclosed)	Use of proceeds alignment with ICMA CTBG
Kansai Electric Power	45	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Nuclear restart and safety; T&D; zero-carbon thermal	Likely aligned, subject to pathway consistency and safeguards disclosure.
Hokkaido Electric Power	20	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Nuclear restart and safety; grid reinforcement	Likely aligned, if nuclear and grid investments are demonstrably linked to credible transition pathways.
Kyushu Electric Power	85	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	High-efficiency LNG; thermal suspension or decommissioning; nuclear refinancing	Likely aligned, with strongest alignment for retirement; LNG and nuclear dependent on safeguards evidence.
Chugoku Electric Power	30	ICMA process standards applied	Renewables; grid reinforcement for renewables expansion	Likely aligned, primarily through green projects and transition-enabling infrastructure.
Hokuriku Electric Power	44	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Biomass co-combustion; T&D projects	Likely aligned, subject to lock-in mitigation and emissions-intensity justification.
Tohoku Electric Power	15	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Interconnection; thermal construction; retirement of older thermal units	Likely aligned, particularly where retirement is evidenced; other categories dependent on pathway alignment.
JERA	20	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Ammonia and hydrogen co-firing; retirement of inefficient thermal plants	Likely aligned, with strongest basis for retirement; co-firing alignment subject to safeguards.
Osaka Gas	72	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Wind and solar; gas and CHP; gas power plant	Likely aligned, with renewables clearly green and gas assets dependent on transition justification.
Tokyo Gas	20	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Electrolysis; methanation; onshore wind; biomass	Likely aligned, subject to credible transition pathway and safeguards.
Saibu Gas Holdings	15	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Gas power asset; solar PV portfolio	Likely aligned, particularly for solar; gas alignment dependent on pathway evidence.
Toho Gas	10	ICMA GBP; Climate Transition Finance Handbook (pre-CTBG)	Methanation; hydrogen; battery; offshore wind	Likely aligned, with renewables clearly green and hydrogen transition-directional.

[9] "Climate Transition Bond Guidelines", ICMA, Nov 2025.
[10] "Climate Transition Finance Handbook", ICMA, Nov 2025.

Overall allocation categories are likely aligned with CTBG principles when assessed through a pathway and safeguards lens. Thermal coal plant retirement and decommissioning are the clearest examples, as they directly reduce emissions and support system-wide decarbonisation. Nuclear restart and safety-related investments may qualify as contributing to low-carbon capacity within clean energy transition pathways, subject to consistency with national roadmaps and adequate safeguards disclosure. Co-firing, hydrogen, methanation, LNG switching, and high-efficiency thermal projects are transition-directional, in that they clearly lower emissions intensity and minimise lock-in risk. Grid reinforcement and interconnection investments act as system enablers for higher non-fossil penetration and flexibility and may be considered pathway-aligned where clearly linked to transition objectives (see the Appendix for more details of Transition bonds: use of proceeds allocation and pathway alignment). Three issuer case studies in the Appendix provide further details on the use of transition bonds within corporate decarbonisation strategies and their alignment with Japanese government transition frameworks including Kansai Electric, Hokkaido Electric, and Tokyo Gas.

Looking at ICMA alignment as defined by Bloomberg, 17 out of the 52 issues in the sample are currently classified as aligned with the relevant ICMA principles.[11] A higher proportion of more recent bond issues fall into this category, suggesting that alignment with ICMA standards has strengthened over time, as seen in Figure 3.

Figure 3. Number of Japan utilities bond issues that are ICMA aligned. Source: Bloomberg Finance L.P. Accessed 16 Feb 2026.



Demand and pricing of utility transition bonds in the domestic market

The BOJ's 2025 Market Functioning Survey indicates that issuance of climate-related ESG bonds, including transition bonds, is ongoing, although supply-demand dynamics have changed as investor base expansion has moderated and pricing advantages have become less consistent. For issuers, ESG bond issuance is primarily driven by strategic and reputational considerations rather than clear funding cost benefits. For investors, demand reflects environmental objectives, stakeholder accountability, and in some cases return considerations, although information sufficiency remains a concern.[12]

[11] ICMA alignment as classified from Bloomberg supports all of ICMA's guidelines, including the Transition Bond Guidelines, if the instrument fulfils all the required pillars of each of ICMA's principles, sourced 16 Feb 2026.

[12] "Results of the Fourth Market Functioning Survey concerning Climate Change", Bank of Japan, Jul 2025.

The corporate JPY bond market predominantly comprises a buy-and-hold investor base with limited secondary turnover. The amount of over-the-counter trading is extremely limited for corporate bonds, with volumes amounting to just 0.1% of the total overall trading bond volumes in 2024. Corporate bonds accounted for about 7.2% of total bond issuance in the market in 2024.[13]

Below are some of the electric utility bond curves for traditional and transition bonds in the domestic market.

Figure 4. Kansai Electric JPY bond curve. Source: Bloomberg Finance L.P. Accessed 20 Feb 2026.

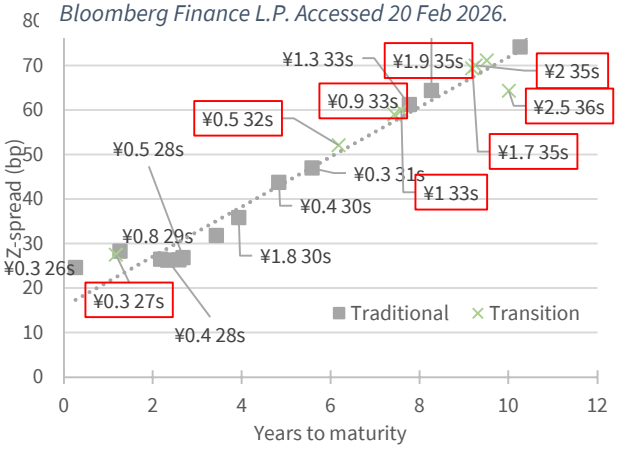


Figure 5. Hokkaido Electric JPY Bond curve Source: Bloomberg Finance L.P. Accessed 20 Feb 2026.

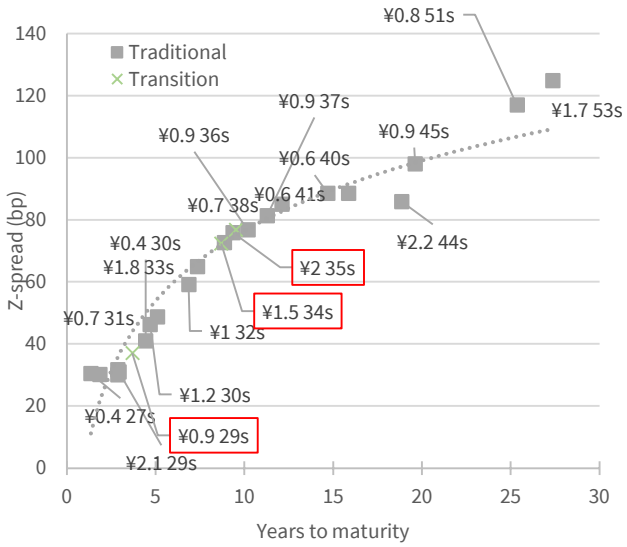
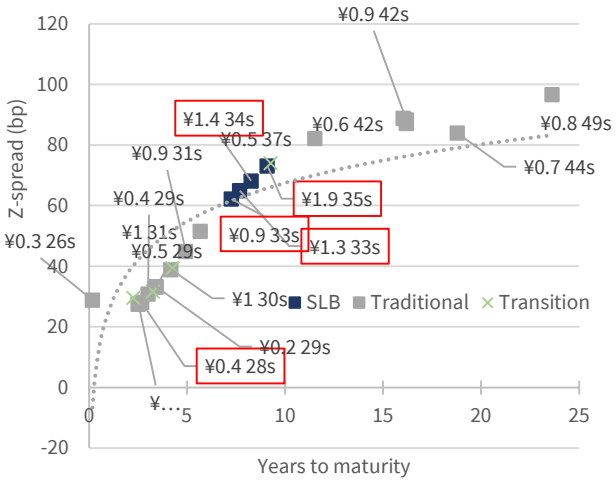


Figure 6. Chugoku Electric JPY Bond Curve. Source: Bloomberg Finance L.P. Accessed 20 Feb 2026



Across Figure 4, Figure 5, and Figure 6, the utility bond curves of Kansai Electric, Hokkaido Electric, and Chugoku Electric do not exhibit any observable greenium for transition bonds, which price broadly in line with their interpolated conventional bond curves at comparable tenors. There may be an exception with recently priced KANSEL 2.571% 2036, which seems to have priced relatively tighter versus the existing curve.

Transition-linked bonds: targets and visibility

Transition-Linked Bonds remain a small, but growing component of the utility transition finance landscape.[14] In the sample analysed, TLB issuance comes to around JPY180 billion across Chugoku Electric Power JERA and Osaka Gas. Chugoku's TLBs are linked to an absolute target to halve retail

[13] "Results of the Fourth Market Functioning Survey concerning Climate Change", Bank of Japan, Jul 2025.
[14] "Japanese SLBs: 2025 update", AFII, 28 Oct 2025.

electricity CO_2 emissions by FY2030 versus FY2013, with provisional FY2024 disclosures indicating progress beyond this 50% threshold. JERA's TLBs are linked to a domestic Scope 1 CO_2 emissions intensity target of 0.477kgCO_2/kWh by FY2030. While the KPI and target level are clearly defined, baseline and interim KPI values have not yet been disclosed, limiting independent assessment of near-term trajectory. Osaka Gas's transition-linked bonds are tied to an absolute reduction target for domestic supply chain CO_2 emissions, covering Scope 1, 2 and 3, with a commitment to reduce emissions by 5 million tonnes by FY2031 versus a FY2018 baseline, with recent disclosures indicating emissions already below the implied target level.

The new GX-ETS (emissions trading system) beginning in April 2026 should make emissions reporting more transparent. Regulated trading depends on standardised, verified data, making clear reporting a core requirement of the system. This is to be based on the GX-league guidelines, complete with monitoring rules, reporting templates, and third-party verification requirements. Japan will start a phasing-in of emissions assurance, with limited assurance from FY26 to FY29 by registered verifiers, moving to "reasonable assurance" from FY29 onwards.[15]Having robust and verified emissions will further strengthen the credibility of TLBs by connecting the issuers' KPIs with their targets and making performance measurable and comparable. This will have a positive impact on investor confidence and demand for these bonds.

Increased issuance in the USD bond market

Japanese electric utilities have increased their use of the USD bond market as part of a broader funding diversification strategy to rising capital expenditures (much of which is front-loaded) and a less accommodative domestic funding backdrop (see Figure 7 and Figure 8). Utilities have ongoing investment needs linked to grid reinforcement, generation asset renewal, decarbonisation initiatives, and nuclear restart and safety upgrades. At the same time, the domestic JPY bond market has become less predictable due to gradually rising long-term rates and structural constraints on incremental issuance capacity. In parallel, the planned abolition of the ippan tanpo (statutory preferential unsecured bond) framework for new issuances has reduced the flexibility and relative attractiveness of traditional domestic bond funding for electric power companies, removing a

Figure 7. Japanese Utilities USD bond issuance by issuance year. Source: Bloomberg Finance L.P., accessed 10 Feb 2026.

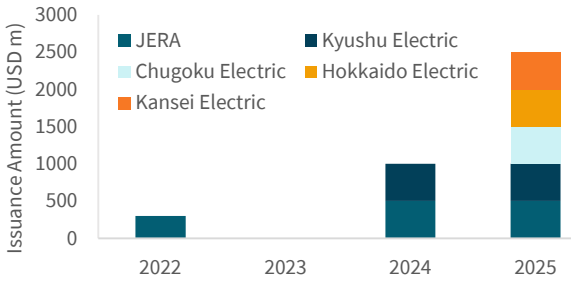
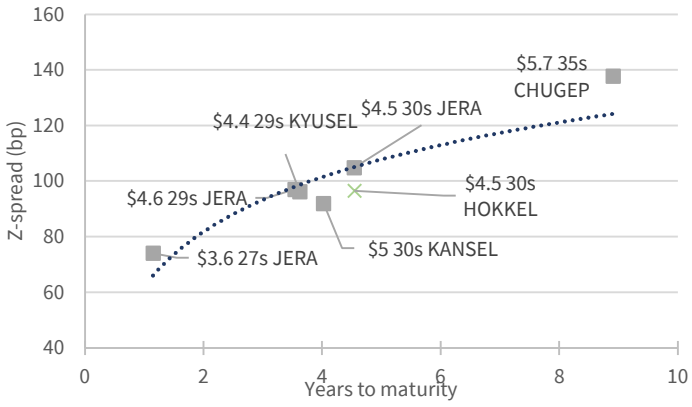


Figure 8. Japanese Utilities USD bond curves. Source: Bloomberg Finance L.P., accessed 20 Feb 2026.



[15] METI begins detailed design of emissions trading scheme; focus on allocation framework, The Energy Conservation Centre, Japan, Aug 2025.

quasi-secured feature that historically supported large-scale JPY issuance.[16] Against this backdrop, offshore USD markets offer deeper liquidity and a broader global institutional investor base, enabling Japanese utilities to execute benchmark-size transactions, while diversifying funding sources and spreading refinancing risk across currencies and markets.

Japan as a leader in transition bonds

The new guidelines from ICMA offer an opportunity for Japan to increase global interest in their transition bond market. Annual global issuance of transition bonds is expected to reach USD40 billion[17] this year as investors and companies seek solutions to fund specific decarbonisation projects in hard-to-abate sectors.

Japan has demonstrated how a system-wide transition finance framework can connect policy and capital markets to drive energy and industrial transformation using fixed income instruments. The government issued JCTBs in 2024 to mobilise capital for this transformation. While corporates started issuing transition bonds in 2022, issuance volumes increased markedly from 2024 onwards. The country is now working to spur more private financing for the transition.

Within the corporate sector, high-emitting issuers will need to exhibit credible transition plans with science-based targets and show a clear roadmap to phasing out fossil assets if they are to attract global investors. The government's planned ETS programme has the potential to strengthen corporates' emissions reporting, which in turn should bring more credibility and transparency to their transition bonds. Moreover, the issuer base could expand to encompass industrial sectors such as steel and cement.

Transition reporting standards can be further strengthened through timely updates on how proceeds are allocated, with detailed project breakdowns and focused impact reports. Best practices allow greater transparency and easier access to data, which can better attract global investors.

Japan's current energy policy is increasingly structured around a pro-nuclear core, with Prime Minister Takaichi advocating for accelerated reactor restarts, support for next-generation nuclear technologies including fusion, and a strategic repositioning of nuclear as central to energy security and price stability.[18] At the same time, Tokyo is deprioritising large-scale "mega-solar" projects, tightening regulations, and stepping back from policy support for utility-scale developments that rely heavily on imported panels, reflecting a preference for technologies with stronger domestic industrial linkages.[19] In line with this initiative, Takaichi has promoted perovskite solar cells as a differentiated technology, which Japan could champion as an export industry rather than competing with commoditised mass solar manufacturing.

It is worth noting, however, that the nuclear tilt is not without risk: Chubu Electric's Hamaoka restart review was halted after the utility acknowledged submitting flawed seismic data, underscoring how governance and regulatory credibility remain critical constraints on the pace and durability of Japan's nuclear revival.[20]

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[16] "Funding opportunities post ippan tanpo: Kansai Electric", AFII, 7 Mar 2025.
[17] "Global sustainable finance outlook 2026 executive summary", 21 Jan 2026.
[18] "Nuclear power at heart of new Japan prime minister's energy policy", Reuters, 22 Oct 2025.
[19] "Japan to tighten regulations on mega-solar projects to protect nature, landscape", Reuters, 25 Dec 2025.
[20] "Japan regulator says it may start Chubu Electric nuclear review from scratch | Reuters", 7 Jan 2026.

Conclusions

The transition bond market in Japan is poised for expansion, with the government leading via the issuance of climate transition bonds and the utility sector following. The initial wave of transition financing has mostly been focused on the domestic market. However, with ICMA's new CTB guidelines and the global focus on financing hard-to-abate sector transitions, Japan will be able to harness global investment interest. This is a critical time for Japan to accelerate transition financing given its focus on energy security and energy independence, and the fact that nuclear restarts are a priority of the new government.

Japan has a clear transition policy, coordinated through various policy mandates — including the GX policy. The JGB market is currently undergoing unprecedented volatility, especially at the long end. At the shorter end, bond yields are likely to have an upward bias as the BoJ is expected to continue to hike rates. However, demand for JCTBs with a 5 year tenor has continued to be firm. Bond investors looking to participate in economy-wide transitions may consider JCTBs, especially in the 3-5 year range, as they provide an increasingly attractive short-dated yield and notably less volatility than the long-end.

For those looking to support sector-specific transitions, such as in the energy and utility sectors, Japan has a host of corporate issuers tied to the nuclear ramp up. These companies will likely have to tap the global bond markets to finance their transition.

Appendix

Table 4. JCTB funded projects and expected or actual impact. Source: Japan Climate Transition Bonds Allocation Report for FY23

JCTB proceeds	ICMA green category for allocation/impact	Project	Expected (or Actual) impact
Hydrogen steelmaking	Circular economy adapted products, production technologies and processes	Commercialise hydrogen-based reduction for steel by 2030.	Expected reduction of about 2 million tCO2/year.
Thermal processes (manufacturing)	Energy efficiency	Establish ammonia and hydrogen combustion industrial furnace technology and electric furnace technology. Install 1300 units/yr that will achieve 50% reduction rate of CO2 emissions from FY32-40. 100% reduction from FY41-50.	Expected reduction of 2.6 million tCO2/yr additionally from FY32-40; Reduction of 5.2 million tCO2/yr additionally from FY41-50.
Battery supply chain	Energy efficiency (battery industry sub-criterion)	EVs battery supply and storage: 15 supply plans, 120GWh production base with 150GWh production by 2030.	Expected 13.5milion tCO2 of avoided emissions over lifecycle of vehicles with the batteries.
Semiconductor supply chain	Clean transportation and Renewable energy	Power semiconductors for EV to improve vehicle efficiency. Expand production in power semiconductors (SiC and Si) and SiC wafers. Provide subsidies for 3 implementors (companies). No timeline provided.	Expected 1.799 million tCO2/yr of avoided emissions.
Residential insulation	Energy efficiency (houses and buildings)	Subsidies for households to install window insulation to reduce air-con usage. FY22-23: covered 203,365 single family homes and 40,301 multi-family units.	Actual impact for FY22-23: 126,000 tCO2/yr of avoided emissions.

Transition bonds: use of proceeds allocation and pathway alignment

Across the utility transition bonds analysed, use of proceeds is concentrated in a small number of system-level categories. As shown in Figure 9, on an aggregate basis approximately 26% to high-efficiency gas and CHP, 23% of proceeds are allocated to transmission and distribution (T&D) and grid reinforcement, 22% to thermal decarbonisation retrofits such as biomass, ammonia, or hydrogen co-firing, 17% to nuclear restart- and safety-related expenditure. Direct allocations to renewables, storage, offshore wind, and early-stage hydrogen or methanation projects together account for less than 12% of total volumes.

Figure 9. Breakdown of use of proceeds (%). Source: Issuers' reports, AFII calculations.

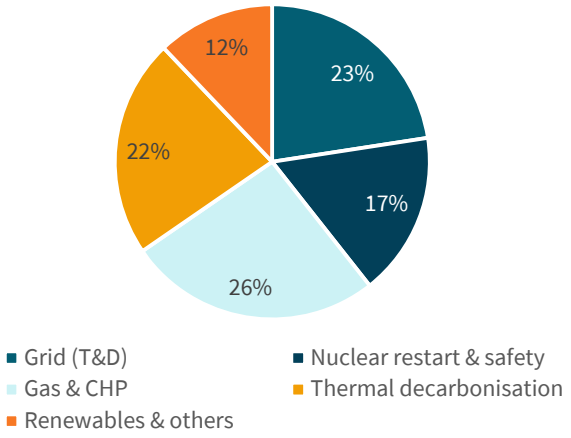


Figure 10. Use of proceeds by allocation. Source: Issuers' reports

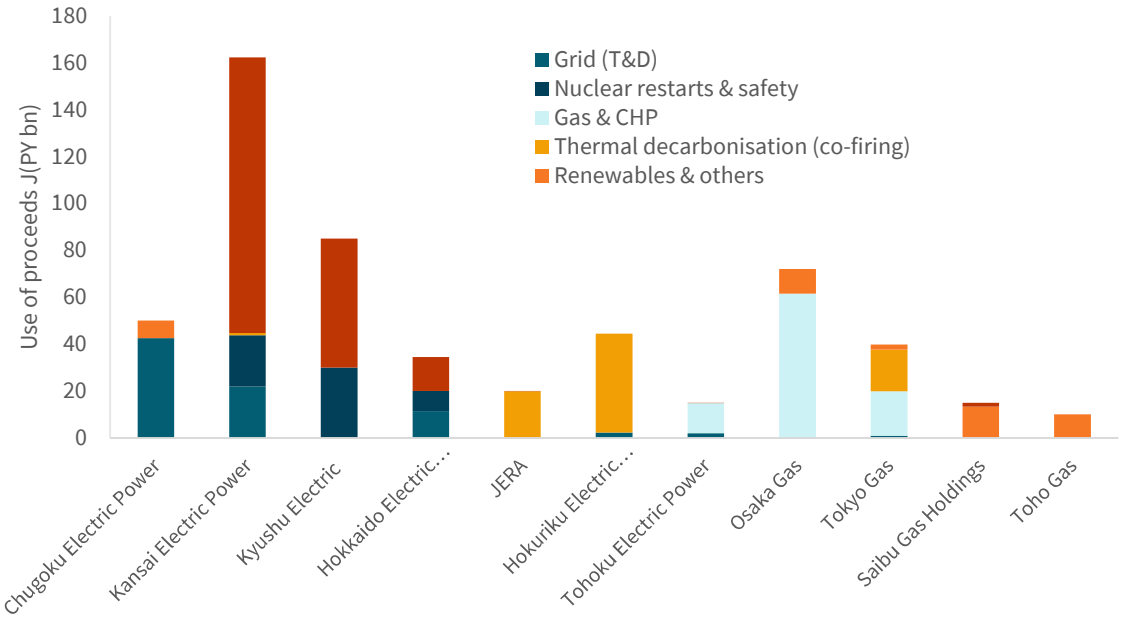
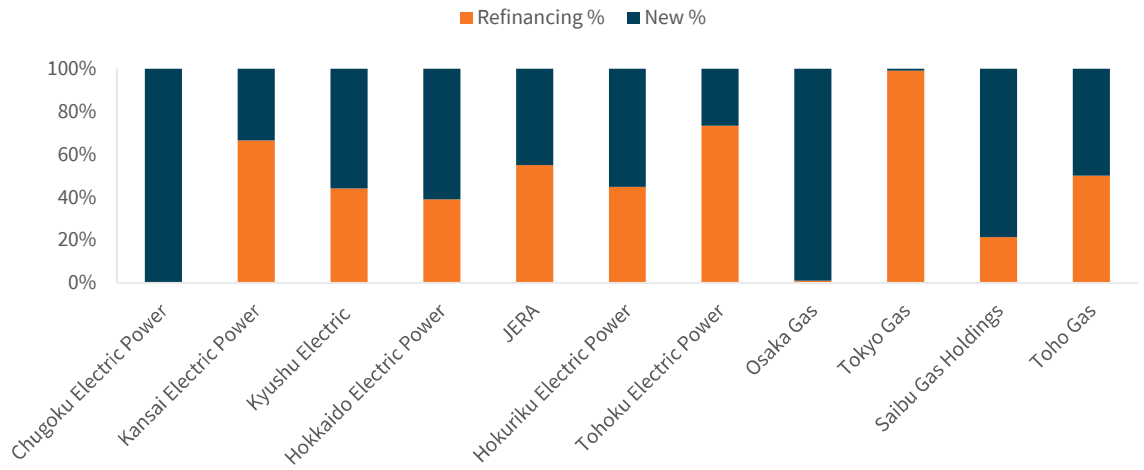


Figure 10 shows each issuers' use of proceeds allocations. T&D-related allocations are led by Chugoku Electric, Kansai Electric, Hokkaido Electric, Hokuriku Electric, and Tohoku Electric, where grid spending is typically the single largest use-of-proceeds category. Based on issuer frameworks and post-issuance reports, T&D proceeds are used for a combination of renewables integration and system reinforcement, including (i) expansion and strengthening of transmission lines in renewable-rich regions, (ii) inter-regional interconnection projects and congestion relief, (iii) reinforcement of substations and distribution networks to accommodate variable power flows, and (iv) digitalisation and operational upgrades such as advanced grid control, forecasting, and resilience enhancements. Issuers generally do not disclose a quantitative split between

renewables-enabling investment and routine asset renewal; as such, T&D allocations are best interpreted as system enablers that support higher non-fossil penetration and system flexibility rather than direct emissions-reduction projects.

Nuclear-related allocations are concentrated among Kansai Electric and Hokkaido Electric, where nuclear restarts and safety-related expenditure represent a core transition pathway and account for a material 30–35% share of total utility transition bond volumes. These proceeds are directed toward safety upgrades, restart readiness, and compliance with post-Fukushima regulatory requirements, and are treated as transition-aligned under the METI power-sector roadmap due to their potential to displace fossil generation with firm, low-carbon capacity. Thermal decarbonisation through co-firing is driven primarily by Hokuriku Electric and JERA, while high-efficiency gas and CHP allocations are most prominent at Tohoku Electric, Osaka Gas, Tokyo Gas, and Saibu Gas.

Figure 11. Use of proceeds by financing type. Source: Issuers' reports.



Refinancing is a common structural feature of utility transition bonds. For issuers that disclose refinancing explicitly, around 50–55% of total proceeds are used for refinancing, with higher shares typically associated with large-scale nuclear and grid programmes, as seen in Figure 11. In these cases, the transition relevance of the instruments is determined less by the incremental nature of individual expenditures and more by their alignment with forward-looking system transition pathways, particularly grid readiness, firm low-carbon capacity, and reductions in emissions intensity across the power system.

Case study: Kansai Electric – top transition bond issuer

Kansai Electric Power is Japan's second-largest integrated power and utility company, with activities spanning electricity generation, transmission, and distribution. It is also Japan's largest nuclear power producer, accounting for close to 50% of Japan's operating nuclear capacity as of December 2024. In recent years, the company's generation profile has increasingly emphasised nuclear power, consistent with the government's GX policy framework, which recognises both renewable energy and nuclear utilisation as core pathways for power-sector decarbonisation.

Evolution of labelled bond issuance

Kansai Electric's SDGs finance disclosures show a clear progression from green bond issuance in 2022–2023 to transition bond issuance from 2024 onwards (see Table 5).[21] In March 2024, the company established its Green and Transition Finance Framework. This was revised in June 2024 to broaden eligible use-of-proceeds categories and diversify funding channels, ahead of issuing its first transition bonds in July 2024.[22]

The revised framework expanded use-of-proceeds scope beyond renewable-only green eligibility to include nuclear restart and safety expenditure, zero-carbon thermal initiatives such as hydrogen, ammonia, and CCUS-related studies, and transmission and distribution renewal, resilience, and digitalisation. This marked a shift toward system-level transition financing.

Transition issuance subsequently scaled up, with JPY109.8 billion raised in 2025 and JPY 7.6 billion in 2026. Allocation reports for these tranches are not yet available, although categories remain consistent with the transition framework. Separately, the company issued an unlabelled USD500 million bond in February 2025 for general corporate purposes.

Table 5. Kansai Electric labelled bond issuance by issuance year. Source: Company reports.

Year	Type	Amount raised (gross)	Use of proceeds breakdown
2022	Green	JPY55bn	Development, construction, operation, and refurbishment of renewable energy projects (hydroelectric-, wind, and solar power) Hydrogen-related R&D, demonstration and study
2023	Green	JPY40bn	Projects related to the promotion of energy creation and storage
2024	Transition	JPY45bn	Nuclear 48.9% - Safety measures for new regulatory standards (restart-related works), inspections and repairs for safe and stable operation, and equipment renewal to enhance safety. T&D 48.9% - Renewal of aging facilities, resilience strengthening, decentralisation, and digitalisation. Zero-carbon thermal 2.2%.
2025	Transition	JPY109.8bn	2025 allocation report not available yet.
2026	Transition	JPY7.6bn	2026 allocation report not available yet.

[21] "Kansai Electric Power Group Integrated Report 2025", Value Creation, 2025.
[22] "Kansai Electric Green/Transition Finance Framework", 10 Jun 2024.

Energy mix and structural transition

Looking at the company's current energy mix, capital expenditure priorities, and decarbonisation roadmap, the transition bond framework aligns closely with Kansai Electric's stated Zero Carbon Vision and Roadmap. The company emphasises maximising the use of existing nuclear capacity on a safety-first basis, expanding renewable energy, reinforcing transmission and distribution networks to support system stability and renewable integration, and pursuing technological pathways to decarbonise thermal generation. Kansai Electric has disclosed a quantified **renewables ambition of 5 GW of new renewable energy development** and 9 GW of cumulative domestic renewable capacity by 2040.

Table 6. Kansai Electric Energy Mix - Current and estimates. Source: Company's reports and AFII.

Source	2024 Installed Capacity (MW)	2024 Generation Mix (%)	2024 Implied Utilisation (%)	Capacity Adds / (Reductions) to 2040 (MW)	2040E Installed Capacity (MW)	Modelled Utilisation (%)	2040E Projected Generation Mix (%)
Nuclear	6,578	48%	85%	0*	6,578	85%	41%
Thermal	13,001	38%	34%	- 1,800	11,201	35%	29%
of which coal	*1,800*						
Hydro	8,259	13%	18%	-	8,259	18%	11%
Renewables (ex-hydro)	*4,125*	–	-	*5,000*	*9,125*	*30%*	*20%*
Total	31,963	100%	–	3,200	–	–	100%

Note: FY2024 capacity reflects company disclosures; projected changes assume ~1.8 GW coal retirements, ~5 GW renewable additions, flat nuclear capacity (~6.6 GW), and modelled utilisation rates (nuclear 85%, thermal 35%, hydro 18%, renewables 30%); projected mix is analytical and not company guidance.

As shown in Table 6, Kansai Electric's projected capacity trajectory reflects portfolio reallocation rather than material fleet expansion. AFII estimates assume a ~1.8 GW reduction in coal capacity and a ~5 GW increase in renewables by 2040, while nuclear capacity remains broadly stable at ~6.6 GW. The resulting energy mix shift is driven more by higher renewable penetration and sustained nuclear utilisation than by aggregate capacity growth.

Case study: Hokkaido Electric – grid-anchored transition financing

Hokkaido Electric Power (HEPCO) is a regional integrated utility serving Japan's northernmost power system, with activities spanning electricity generation, transmission, and distribution. The Hokkaido grid is structurally distinct from other regions due to its limited interconnection capacity with Honshu, high exposure to thermal generation, and a growing need for grid reinforcement to accommodate both renewable energy integration and new industrial demand.

Evolution of labelled bond issuance

HEPCO entered the labelled market in 2024 with a domestic green bond, followed by transition bonds under a framework aligned with Japan's transition finance guidelines. The transition label enables financing of nuclear safety capex and transmission and distribution upgrades that fall outside conventional green eligibility.

Scope under transition framework

Eligible categories include nuclear safety, inspections and equipment renewal for Tomari Nuclear Power Station restart and continued operation; transmission and distribution reinforcement to

improve system stability and integrate renewables; and thermal decarbonisation initiatives including efficiency upgrades and preparatory work for hydrogen and ammonia co-firing.

Issuance profile

In October 2024, HEPCO issued JPY60 billion of transition bonds across two tranches, with proceeds allocated to nuclear safety and restart-related capex at Tomari and to grid reinforcement. In 2025, it issued a USD500 million labelled bond in international markets, identifying nuclear safety and continued operation of existing nuclear facilities as core eligible uses.

Transmission investment and industrial demand linkage

A distinguishing feature of Hokkaido Electric's transition strategy is the **explicit linkage between grid investment and industrial demand growth**. The company has disclosed plans for **approximately 300 MW of transmission and system expansion by FY2028**, aimed at strengthening the Hokkaido power network.

This grid expansion is closely linked to **new large-scale electricity demand from semiconductor manufacturing**, including facilities under development in Hokkaido. These projects materially increase base-load demand and require corresponding reinforcement of transmission capacity and system reliability. As such, transmission investment serves a dual role: enabling economic development while supporting longer-term decarbonisation through improved system flexibility and renewable integration.

Installed capacity and generation mix

As shown in Table 7, the projected generation mix shift is driven by nuclear restart and coal decommissioning. Higher nuclear utilisation materially increases low-carbon output without new nameplate additions, while thermal capacity reductions compress the emissions-intensive share of

Table 7: Hokkaido Electric current and projected installed capacity and output mix. Table 8. Hokkaido Electric current and projected installed capacity and output mix. Source: Hokkaido Electric and AFII.

Type	FY2024 Installed capacity (MW)	FY2024 Generation mix (%)	FY2024 Implied utilisation (%)	Capacity change to FY2030 (MW, AFII)	FY2030E Installed capacity (MW)	Modelled Utilisation (%)	FY2030E Projected generation mix (%, AFII)
Thermal	4,891	84%	38%	-1,300	3,591	38%	40%
Nuclear	2,071	0%	0%	-	2,071	80%	48%
Renewables (hydro + geothermal)	1,732	16%	20%	400	2,132	20%	12%
Total	8,702	100%	-	-900	7,802	-	100%

Note: FY2024 installed capacity and generation mix are based on Hokkaido Electric company disclosures. FY2030 projections reflect AFII analytical assumptions, including thermal capacity reductions (–1.3 GW), renewable additions (+0.4 GW), flat nuclear capacity, and modelled utilisation rates; projected mix is not company guidance.

Case study: Tokyo Gas – a gas-anchored transition

Tokyo Gas was one of the first issuers of transition bonds in March 2022, raising about USD325 million of transition bonds in the domestic market. Proceeds were primarily used for the Niihama LNG receiving terminal and related infrastructure, which helped the company to switch from coal and oil to natural gas. Secondly. the company developed some smart energy networks and

conducted an early-stage hydrogen demonstration project in Harumi, Tokyo. These early projects helped to decarbonise its existing gas network. The three projects contribute to the reduction of about 310k tCO2 annually by 2030.

The company has plans to reduce emissions by 20% vs FY2022, and 60% by FY2040, before reaching net zero by FY2050. **Rather than decreasing gas capacity and transitioning to renewables, Tokyo Gas is expanding its gas assets and plans to decarbonise over time with CCUS, hydrogen, and e-methane.** Although this pathway is aligned to Japan's SEP, it is increasingly tilted towards upstream gas assets and gas trading operations (based on its recent activities) and further away from renewables.[23]

Japan's SEP calls for securing fossil interests overseas and stabilising LNG supply. While GX policy does not aim at increasing fossil interests, it is predominantly focused on technologies that decarbonise thermal power. However, technologies such as hydrogen co-firing or e-methane are still unproven, inefficient, or hard to scale.

Tokyo Gas states that its transition roadmap is aligned with METI's gas sector roadmap. METI has even featured Tokyo Gas as part of a case study on transition finance, using the company's transition bond issuance as a model case. **However, the roadmap's reliance on future abatement technologies means that alignment is policy-based rather than outcome-based, with emissions reductions contingent on technologies that remain commercially and operationally uncertain at scale.**

Upstream investments

Between 2023-2025, Tokyo Gas has acquired US shale assets in Rockliff (USD2.7 billion) in Haynesville[24] and Chevron East Texas assets (USD525 million) via its US subsidiary TG Natural Resources. The rationale was to secure long-term gas supply and capture margins on the value chain. This increases the company's exposure to the US gas market and makes gas lock-in more likely. Tokyo Gas also acquired a stake in ARM Energy Trading, a gas marketing and trading platform in North America. This is an effort to maximise profits from trading the gas markets. Additionally, Tokyo Gas sold its Mexican renewables platform of about 900 MW of solar and wind assets.

On October 24, 2025, Tokyo Gas signed a Letter of Intent to offtake 1million mt/year of LNG from the Glenfarne Alaska LNG project, alongside a similar commitment by JERA. This contributes to Japan's USD550 billion investment pledge to the US, as part of negotiations with the Trump administration. Tokyo Gas is also considering participating in a US Gulf Coast liquefaction project or further LNG purchases. Recently, the company signed a long-term purchase agreement with Venture Global for 1 million metric tons/year of LNG for 20 years from 2030 onwards. The company has allocated JPY350 billion for overseas investments in its FY26-29 plan.

[23] Please see AFII research "Japan Gas Utilities – LNG exposure creates risks for bondholders", 27 Feb 2025 on Japan gas utilities' forays into LNG value chain.

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