INVESTOR BULLETIN

OPTIMISING TRANSITION FINANCE IN THE JAPANESE STEEL VALUE CHAIN

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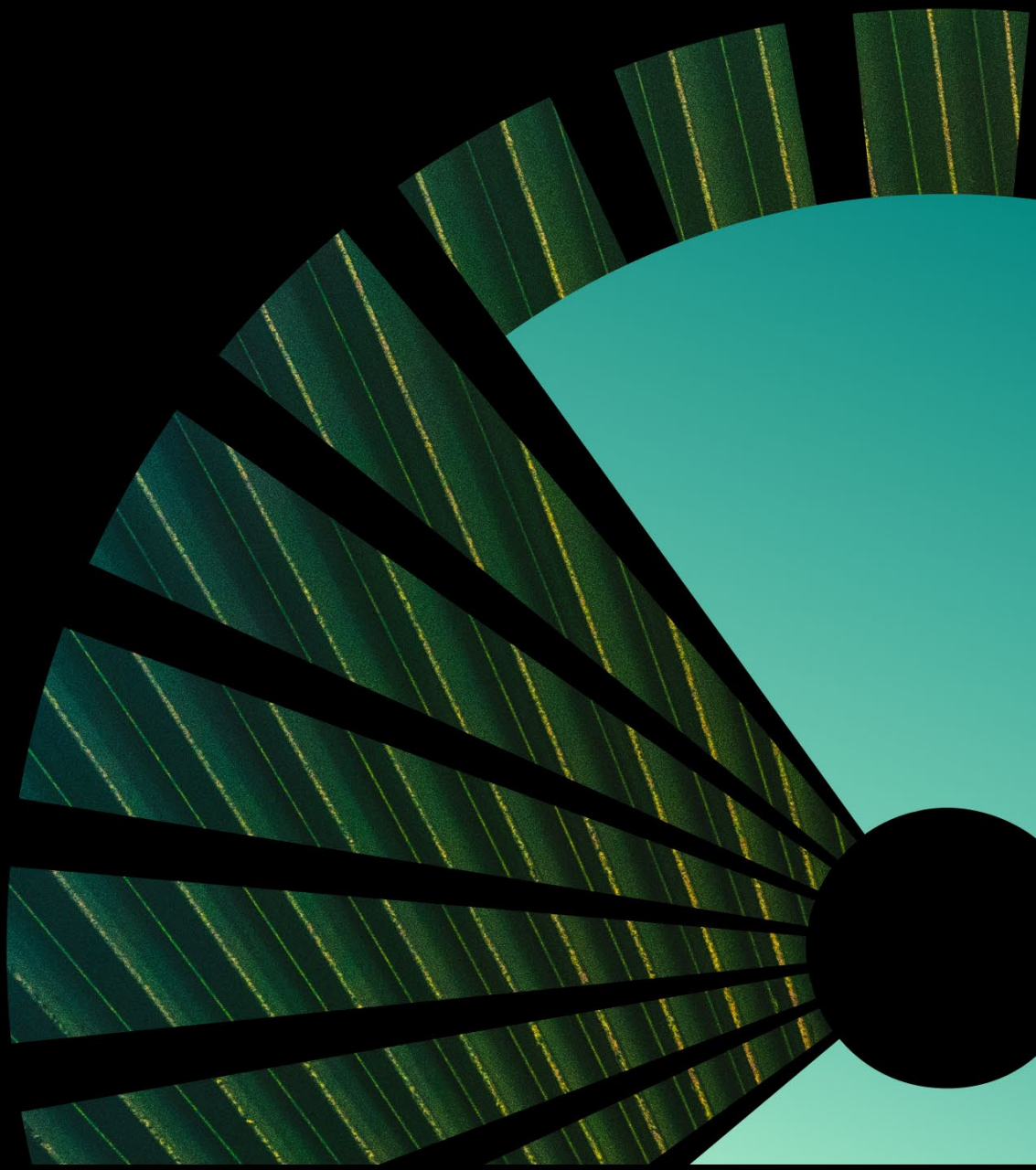

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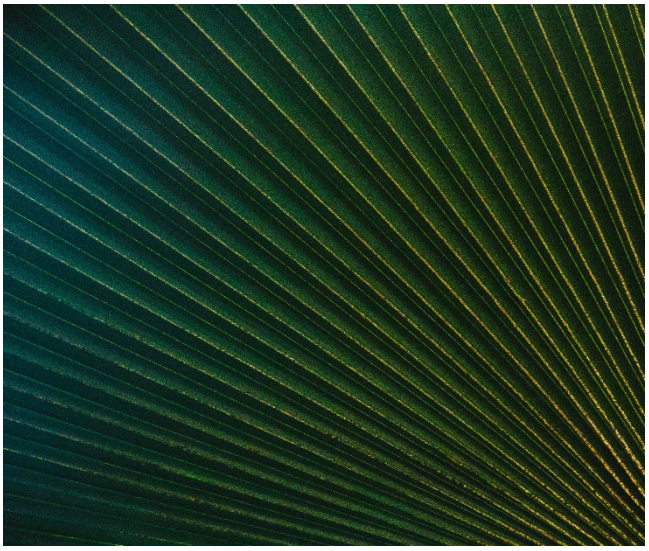

OPTIMISING TRANSITION FINANCE IN THE JAPANESE STEEL VALUE CHAIN

Japan's Green Transformation (GX) transition finance initiative is among the largest in the world, with funding as a percentage of GDP greater than the US Inflation Reduction Act at its peak.[1] While GX and other sources of Japanese transition finance are enabling some promising decarbonisation investments, they also risk entrenching fossil fuel use and inhibiting future competitiveness by financing technologies with limited decarbonisation and commercial potential.

Investors have an important role to play in shaping policy settings to support greater, greener value creation across the Japanese economy. This bulletin spotlights opportunities for investor stewardship in the steel value chain, where policy signals set before 2030 will be highly impactful.

Key points

- Funding for steel industry decarbonisation in Japan is incentivising technology pathways that risk entrenching fossil fuel use. While CAPEX subsidies and OPEX tax credits are enabling conversions of steel blast furnaces to lower-emissions electric arc furnaces (EAFs), R&D subsidies have favoured blast furnace technologies, despite their limited decarbonisation potential.
- The Japanese steel industry is mainly relying on lowering production to meet its 2030 emissions reduction goal. Achieving the industry's 2050 net zero goal while also creating value will require investment in technologies with strong decarbonisation and commercial potential.
- With 13 blast furnaces, owned by Japan's three biggest steelmakers and representing approximately 61% of Japan's steel production capacity needing reinvestment, conversion, or closure by 2035, it is critical that policy supports technology transition pathways with the most potential for long-term value accretion and decarbonisation.
- Investors have an opportunity to enable this along the steel value chain by:
    - Seeking more robust technology planning from steelmakers: Investors can encourage steelmakers to develop more detailed transition plans for beyond 2030, which evaluate the cost, risk, and decarbonisation potential of different technologies. Detailed company transition plans are critical to inform policy roadmaps and funding programs that policymakers will update and develop before 2030.
    - Engaging companies along the value chain on policy reforms to help foster a green steel market: Automakers can be encouraged to advocate for steel emissions accounting methodologies to align more closely with international best practice. These methodologies underlie Japan's steel subsidies for the automotive sector and wider public procurement rules. The power sector can be encouraged to advocate for reforms to drive renewables development, which in turn would enhance the supply of clean energy for steelmaking.
    - Engaging policymakers to support technology with high decarbonisation and commercial potential: Investors can help ensure that transition finance programs, public procurement frameworks, and technology investment roadmaps are strengthened ahead of 2030. This work can enable more conversions of blast furnaces to EAFs, strengthen demand signals for low-emissions steel, and support a policy environment that enables secure green iron supply in the future. Investors can engage both directly and via investor partnerships.

[1] Jefferies, Japan's GX Plan: Is the World's Most Ambitious Energy Transition Being Overlooked?, 29 January 2025.

TRANSITION FINANCE IN JAPAN RISKS ENTRENCHING FOSSIL FUEL USE

The GX initiative is Japan's flagship strategy for reaching carbon neutrality by 2050. It provides ¥20 trillion in transition finance from FY2023-33. These funds are being raised through dedicated bond issuances and are additional to other non-GX sources of climate and energy funding.

In Japan, transition finance is enabling research and development (R&D) and investment in high-potential decarbonisation technologies, such as EAFs, renewables generation and battery electric vehicles.

However, it is also incentivising investment in technologies which risk entrenching fossil fuel use, such as ammonia-coal cofired power generation, hydrogen-injection and carbon capture and storage (CCS) for steel blast furnaces, and plug-in hybrid vehicles.[2] Subsidies for such technologies can obscure their lack of long-term competitiveness, unnecessarily extend fossil fuel use and divert resources away from technologies with higher decarbonisation and value-creation potential.

The approach to transition finance in the steel industry shows how industry advocacy can influence policy priorities and underscores the opportunities for investors to shift investment away from technologies with low decarbonisation potential.

[2] See sector plans in: METI, Transition Finance, 8 April 2026; ClientEarth, GX bonds and lingering concerns about carbon lock-in, 5 March 2025.

POLICY SHOULD PROMOTE INVESTMENT BASED ON COMMERCIAL AND DECARBONISATION POTENTIAL

The steel industry is Japan's highest emitting industrial sector and one of 16 sectors targeted by Japanese transition finance.[3] Because decreasing production volumes are the primary driver of the emissions reductions needed to reach the industry's 2030 emissions reduction target,[4] decarbonisation technology will be increasingly important for delivering sustainable decarbonisation beyond 2030. With 13 blast furnaces, owned by Japan's three biggest steelmakers and representing approximately 61% of Japan's steel production due for relining, conversion, or closure before 2035,[5] it is critical that policy settings adapt to enable companies to invest in technologies with the greatest commercial and decarbonisation potential.

So far, transition funding has enabled Final Investment Decisions (FIDs) on multiple blast furnace to EAF conversions – an important step towards the full decarbonisation of steelmaking. However, R&D funding is disproportionately incentivising development of blast furnace technologies, which target 50% or more emissions reductions rather than near-zero emissions.[6]

Current transition funding and impact

Under the current transition funding framework, Japanese steelmakers can access funding for R&D, CAPEX and OPEX.[7] Table 1 outlines the impact that each category of funding is currently having.

Table 1: Current transition finance directly available for Japanese steelmakers

Funding type	Current size and allocation of funding	Material impact of funding
R&D funding *Green Innovation Fund (2021-2030)*	• Green Innovation Fund R&D is funded through a combination of company investment and public subsidies. • ¥439.16 billion (bn) in subsidies is allocated to R&D across blast furnace and non-blast furnace technologies,[8] with around 64% earmarked for blast furnace technologies.[9] • Steelmaking subsidies account for nearly 80% of total R&D spending under the Green Innovation Fund.[10]	• Company R&D expenditure mirrors subsidy allocation (around 65% for blast furnace technology), suggesting subsidies have a significant influence on the allocation of private R&D spending.
CAPEX funding *2025-2029 Energy and Manufacturing Process Transformation*	• Subsidies of up to one-third of CAPEX for converting blast furnaces to EAFs which reduce	• Nippon Steel and JFE Steel state that this

[3] METI, Revision of Sector-Specific Investment Strategies as Effort for Specifying Investment Promotion Measures for the Realization of GX, 27 December 2024.
[4] JISF, Report of "JISF's Carbon Neutrality Action Plan", February 2025, pp. 11-12.
[5] ACCR calculation based on: World Steel, World Steel in Figures 2025, accessed 10 April 2026 and Steelmakers face crunch-time on coal: critical risks in blast furnace relining decisions, 19 May 2025.
[6] NEDO, Hydrogen Utilization in Iron and Steelmaking Processes, accessed 30 March 2026.
[7] The Green Innovation Fund is largely funded from the Special Account for Energy Measures but has been supplemented by GX funds. CAPEX subsidies and OPEX tax credits are funded by GX. A ¥174.3 bn subsidy program for efficiency upgrades is not included in Table 1 because it does not support fundamental process transformation. JFE has received ¥6 bn from this program: JFE, Environmental Management Strategy, 29 May 2024, p. 14; Table 2 in Renewable Energy Institute, Remaining Challenges for Mass Balance Products, 23 October 2025.
[8] NEDO, Hydrogen Utilization in Iron and Steelmaking Processes, accessed 30 March 2026.
[9] Percentage is an ACCR calculation based on: NEDO, Appendix 2-1, 10 March 2026.
[10] Note that the Japanese steel industry plans to spend around another ¥238 bn on R&D and implementation of decarbonisation technologies, around double its spending in the GI Fund, however the industry has not clearer disclosed how and when this money will be spent: NEDO, Business Strategy Vision, April 2025, p. 10.

Support Business (Business I (Steel)	emissions by at least 50% and produce high grade steel.[11] • JFE Steel will receive up to ¥104.5 bn for construction of one EAF and Nippon Steel will receive up to ¥251.4 bn for three EAF investments (new conversion, expansion and restart).[12]	funding enabled their EAF FIDs.[13] • ¥355.9 bn in subsidies prompted ¥842.2 bn in company investment.
OPEX funding *Strategic Field Domestic Production Promotion Tax System*	• 10 years of tax credits for the production and sale of steel from EAFs converted from blast furnaces. • ¥20,000 per tonne in years one-to-seven, declining by ¥5,000 each year thereafter. Steel must match blast furnace steel quality and deliver 10% added value by the end of the 10-year period.[14]	• This tax credit makes EAF conversions substantially more cost competitive.[15]

Blast furnace technology continues to receive outsized R&D funding

Despite its low decarbonisation potential and high implementation risks, blast furnace technology continues to receive significant levels of R&D funding. As noted, over 60% of steel R&D spending via the Green Innovation Fund is earmarked for blast furnace technologies: COURSE50 and carbon recycling.[16]

These technologies face significant technical and commercial challenges. The Japanese steel industry developed COURSE50 to meet the 2007 government goal of a 50% reduction in national emissions by 2050.[17] COURSE50 aims to reduce blast furnace emissions by 30% with CCS (20%) and the injection of hydrogen off-gases (10%). SuperCOURSE50, a newer version of the technology, aims to achieve at least a 50% reduction by injecting additional hydrogen. However, injecting the same amount of hydrogen into direct reduced iron (DRI) furnaces would likely achieve around 2.5 times more emissions abatement than when injected into blast furnaces, and CCS costs remain stubbornly high. COURSE50 also risks increasing overall emissions by extending blast furnace use.[18] After 15 years of significant R&D on COURSE50,[19] its prospects for commercial application remain unclear, with the best test performance to date being a 44.5% emissions reduction in an experimental 12m^3 furnace hundreds of times smaller than commercial furnaces.[20] The costs and hydrogen emissions profile of COURSE50 tests have not been disclosed.

[11] For eligibility criteria, see: METI, Support Program for Energy and Manufacturing Process Transformation in Hard-to-Abate Industries Project I (Steel Industry), October 2024.
[12] JFE Steel, JFE Steel to introduce advanced, high-efficiency, large-scale electric arc furnace in Japan, 10 April 2025; Nippon Steel, Decision is Made to Invest in the Conversion from the Blast Furnace Steelmaking Process to the Electric Arc Furnace Steelmaking Process, 30 May 2025; JFE will also receive debt guarantees to help derisk its EAF conversion investment: Nikkei Asia, Japan to support 'green' steelworks with up to $1.1bn in debt guarantees, 20 March 2026; GX Acceleration Agency, Decision on Debt Guarantee for JFE Holdings, Incorporated, 23 March 2026.
[13] Ibid.
[14] Also capped at 40% of corporate tax liability for projects with at least 50% reduction in emissions, ¥12 bn CAPEX, and a range of quality requirements. See: METI, Application Methods and Key Review Points for the Energy Utilization Environmental Impact Reduction Project Adaptation Plan (Strategic Sector Domestic Production Promotion Tax System), December 2025, pp. 4,12-13 and 37; METI, Tax incentives to promote domestic production in strategic sectors, accessed 13 April 2026.
[15] Transition Asia, JFE Takes a Decisive Step Towards Green Steel with New EAF, 15 April 2025.
[16] METI, 2025 WG report for Green Innovation Fund Project / Hydrogen Utilization in Iron and Steelmaking Processes, pp. 4-5 and 15, 16 April 2026; JISF, Long-term vision for climate change mitigation, March 2025, p. 16.
[17] This goal was known as 'Cool Earth 50'. 'COURSE50' stands for 'CO_2 Ultimate Reduction System for Cool Earth 50': Greins, Technology, accessed 30 March 2026.
[18] SteelWatch, Nippon Steel and hydrogen, October 2024, pp. 7-8.
[19] R&D on COURSE50 and SuperCOURSE50 has been running since 2008, but the amount of money spent through to 2020 is unclear: Green Innovation in Steelmaking, Message, accessed 10 April 2026. More than ¥350 bn in R&D on COURSE50 and other blast furnace technologies is planned for 2021-2030 within the GI Fund. More will likely be spent outside the GI Fund, as noted in Footnote 10. A breakdown of funding between 'COURSE50' and other blast furnace technologies is not available: NEDO, Appendix 2-1, 10 March 2026.
[20] Nippon Steel, Status of Nippon Steel's GX Initiative, 24 March 2026, p. 38. All Japanese blast furnaces are larger than 2000m^3 and most are larger than 4000m^3: JISF, Equipment and Technology. H_2 injection into larger scale blast furnaces have resulted in much smaller emissions reductions: Transition Asia, Hydrogen in Iron Making, 1 September 2025, pp. 1-2.

Carbon recycling faces similar decarbonisation and cost issues. Carbon recycling involves converting furnace CO_2 into methane using hydrogen and then reusing that methane as a reducing agent.[21] It aims for 50% emissions reduction (likely with 20% from CCS) but remains unproven at scale.[22]

The steel industry has historically focused heavily on blast furnace technology in its policy advocacy. Japan's largest steelmakers, Nippon Steel[23] and JFE Steel[24], both claim their advocacy shaped current CAPEX subsidies, OPEX tax credits, procurement standards, automotive incentives and R&D support for the steel industry. Much of this advocacy has been conducted through the Japan Iron and Steel Federation (JISF), where Nippon Steel and JFE Steel have long held key roles.[25]

The Japanese steel industry aims to deploy COURSE50 in blast furnaces from 2030,[26] but has not made clear how extensively it will do so, and how extensively it will deploy SuperCOURSE50 or carbon recycling. The policy support these technologies may need for them to be commercial is also unclear.

[21] JFE Steel, 2025 Group Report, November 2025, pp. 41-42.
[22] Transition Asia, JFE AGM 2025 Information Pack, June 2025, p. 2 and 4.
[23] Nippon Steel Corporation, Nippon Steel's Green Transformation (GX) Initiatives,13 March 2025, p. 68; Nippon Steel Corporation, Status of Nippon Steel's GX initiatives, 24 March 2026, pp. 70-71.
[24] JFE Steel, 'Public Policy Engagement and Outcomes' in Policy Engagement, accessed 30 March 2026.
[25] See Internet Archive, Wayback Machine search of JISF 'officers' page. Until 2018, JISF only planned decarbonisation to 2030 and prioritised COURSE50. JISF, Long-term vision for climate change, p. 1 and 7, accessed 10 April 2026.
[26] NEDO, H_2 Utilization in Iron and Steelmaking Processes, accessed 30 March 2026.

INVESTOR ENGAGEMENT COULD IMPROVE JAPANESE STEEL TRANSITION POLICY

Investors have an opportunity to improve transition finance in Japan by engaging companies along the steel value chain and with policymakers. To ensure more efficient allocation of transition finance in the future, investors should discuss with policymakers how support can prioritise technologies which are competitive on both a commercial and emissions reduction basis.

Engagement with steelmakers and their representatives

One of the most impactful ways that investors can influence transition finance is engaging key companies in the steel industry. As discussed, these companies have had significant influence on policy. Current policy settings provide a disproportionate amount of R&D funding to blast furnace technologies with low decarbonisation potential, do not use steel emissions accounting methodologies that clearly align with international best practice,[27] and are yet to provide significant support to help secure green energy and iron supply.

The Japanese steel industry is yet to produce sufficiently detailed plans for technology development and investment for beyond 2030.[28] It is critical that such plans are developed soon and provide a transparent set of detailed assumptions. They should include different technology investment scenarios which outline changes in competitive conditions, technical progress and external shocks – as recommended by an independent advisory group to Japan's Ministry of Economy, Trade and Industry (METI) on steelmaking innovation.[29] Detailed plans will provide clarity on how the industry intends to align with Japan's new 2035 and 2040 NDCs, and send important signals to policymakers on the policy support needed.

Investors can engage with steelmaking companies and JISF on their post-2030 transition planning and advocacy across four key policy areas: R&D subsidies and technology pathways, CAPEX and OPEX incentives for EAF conversion, demand signals and emissions accounting, and security of clean energy and green iron supply.

Table 2: Key policy areas for engagement with the steelmaking industry in Japan

Policy area	Concern	Engagement approaches
R&D subsidies and technology pathways	• Blast furnace technologies with limited decarbonisation potential receive a disproportionately high amount of R&D funding. These technologies remain unproven at commercial scale despite significant development efforts and spending. • Decreased production volumes are the primary driver of emissions reductions until 2030.[30]	➢ Request disclosure of expected investment and policy support for commercial use of steelmaking technologies beyond 2030. ➢ Request that transition plans and advocacy be rebalanced to favour technologies with the highest commercial and decarbonisation potential, supported by transparent modelling that is responsive to

[27] Including the GHG Protocol, SBTi Corporate Net-Zero Standard and consistent use of ISO standards. For an outline of key methodology concerns and improvements: Climate Group SteelZero, SteelZero Commitment and Procurement Framework, 17 October 2025.
[28] The industry is currently focused on carrying out JISF's Carbon Neutrality Action Plan to 2030 because, it argues, there are too many uncertainties in "the super long-term future beyond 2030": JISF, Long-term vision for climate change mitigation, March 2025, p. 18. The Carbon Neutrality Action Plan provides only limited detail beyond 2030: JISF, Carbon Neutrality Action Plan, February 2025.
[29] Energy Structure Transformation Field Working Group for Green Innovation Project Subcommittee of Industrial Structure Council, Opinion on the "Hydrogen Utilization in Steelmaking Processes" Project, 7 August 2025.
[30] JISF, Report of "JISF's Carbon Neutrality Action Plan", February 2025, pp. 11-12.

	• To continue to meet decarbonisation targets and build long-term value, industry will have to implement technologies with high decarbonisation potential.	technological and market developments.
CAPEX and OPEX incentives for EAF conversion	• The current CAPEX funding round (2025-29) is closed, and it is unclear how much funding will be available from 2030. • Lack of policy certainty and support could hinder timely furnace conversions. ACCR analysis of company disclosures indicates Nippon Steel and JFE alone have around nine furnaces likely to reach relining or conversion age before 2035. The current GX budget for steel is unlikely to be sufficient to support this number of conversions.[31]	➢ Encourage advocacy outlining CAPEX funding requirements for future EAF conversions. ➢ Request that JISF stop advocating for a permanent exemption for metallurgical coal from fossil fuel tax.[32]
Demand signals and emissions accounting methodologies	• Following industry advocacy, some subsidies and public procurement policies have been introduced to support demand for 'GX Steel'.[33] GX Steel uses 'mass balance' and 'allocation method' pooling of emissions reductions from improved processes, rather than necessarily reflecting lower embodied emissions in products. These methodologies are not clearly aligned with international accounting best practice.[34] • Private sector customers lack clarity on the added value of GX Steel and its alignment with international carbon accounting standards.[35]	➢ Encourage advocacy for demand-side support to align with international best-practice emissions accounting standards by ensuring additionality, integrity and transparency of emissions reduction.[36] ➢ Encourage disclosure on the level of demand support needed to meet 10% value-add requirement for OPEX tax credits.
Security of clean energy and green iron supply	• Policy measures to secure clean energy or green iron imports remain at an early and uncertain stage.[37]	➢ Encourage company disclosure of policy support needed to secure adequate green energy and green iron supply.

[31] ACCR calculations indicate the steel industry received 73% of manufacturing CAPEX funding (steel, chemicals, paper and cement) for 2025-2029, when ¥484.4 bn of the ¥1.3 tr in GX manufacturing CAPEX budget was allocated. If steel receives the same percentage of the remaining budget, it would receive around ¥600 bn, but this percentage is not set: METI, Pathways to Japan's Green Transformation (GX), 16 August 2022, p. 20; METI, Support Program for Hard to Abate Processes, accessed 30 March 2026.
[32] JISF, Opinions on the Tax Reform for Fiscal Year Reiwa 8, September 2025, p. 2.
[33] The most significant support measure is an automotive subsidy (up to ¥50,000 per 'clean energy vehicle', which includes BEVs, PHEVs and FCVs). GX Steel also qualifies for public procurement which prioritises environmental impact. GX Steel procurement is being piloted and expanded in public works until 2030, when it will become standard: Nippon Steel, Nippon Steel's Green Transformation (GX) Initiatives, 13 March 2025, pp. 59-60. Nippon Steel, Nippon Steel's Green Transformation (GX) Initiatives, 24 March 2026, pp. 52-56.
[34] Including the GHG Protocol, SBTi Corporate Net-Zero Standard and consistent use of ISO standards. For an outline of key methodology concerns and improvements: Climate Group SteelZero, SteelZero Commitment and Procurement Framework, 17 October 2025.
[35] Renewable Energy Institute, 'Remaining Challenges for Mass Balance Products', 23 October 2025, Section 3; Accenture Development Partnerships for WWF-Australia, Green steel demand in Japan, October 2025, p. 56.
[36] Climate Group SteelZero, SteelZero Commitment and Procurement Framework, 17 October 2025, p. 9.
[37] There is one contract-for-difference scheme supporting hydrogen procurement for the steel industry, however this is for heating furnaces, not fundamental process transformation: Toyota Tsusho, Media Release, 30 September 2025. METI is considering further hydrogen price-gap support for steel, but details have not been disclosed: METI, Sector-Based Investment Strategy (ver. 3), 26 December 2025, p.18.

Engagement along the value chain

Investors can elevate their potential for impact by pursuing policy engagement in related value chain sectors.

For example, investors in the automotive sector could encourage the industry – as important potential green steel purchasers – to advocate for GX Steel definitions that better align with international emissions accounting standards. Investors in the power sector could encourage advocacy for stable policy supporting renewable energy development, power market reforms and grid flexibility, while discouraging advocacy for costly, high-emissions ammonia cofiring and indefinite coal use.

Engagement with policymakers

Investors also have an opportunity to engage directly with policymakers, such as various GX authorities, the R&D agency NEDO, divisions of METI focused on technology pathways and transition finance,[38] the Ministry of the Environment, and agencies which could play an important role in enabling green iron trade in future.[39]

These engagements should focus on updating transition finance programs, public procurement frameworks, and technology investment roadmaps before 2030. These policy areas are particularly important for incentivising the conversion of blast furnaces to EAFs, strengthening the nascent market for reduced emissions steel, and providing greater certainty on how policy can support green iron procurement.

Beyond the steel sector, investors can also seek more clarity from policymakers on:

- Carbon pricing design: Over the next two years, investors can provide feedback on the effectiveness of Japan's carbon pricing – both at sector and economy-wide levels – as Japan's mandatory GX Emissions Trading Scheme (GX-ETS) and GX Surcharge launch in FY2026 (i.e. from April) and FY2028, respectively.
- Expanding GX funding: Investors seeking long-term policy clarity can engage policymakers on the size of future GX funding. Mitsubishi Research Institute estimates that GX funding to 2050 will need to be 3.5 times greater than current funding to enable carbon neutrality by 2050. Increases to GX funding could result in higher carbon pricing under GX-ETS and GX Surcharge.[40]

[38] For example, GX Implementation Council, GX Investment Promotion Division, GX Policy Group, and divisions of the Manufacturing Industries Bureau and the Agency for Natural Resources and Energy.
[39] For example, Japan Bank for International Cooperation (JBIC), Japan Organization for Metals and Energy Security (JOGMEC) and Nippon Export and Investment Insurance (NEXI).
[40] Mitsubishi Research Institute, Carbon Pricing in Japan: A policy perspective, 26 July 2023; METI, Transition Finance, 8 April 2026.