

JAPAN

POLICIES TO
GROW *CREDIBLE*
TRANSITION
FINANCE

GX: a solid foundation that now needs sharpening and tightening to fully meet 1.5°C objectives

Japan has committed to delivering on the Paris climate agreement and as part of the G20, 'resolve(s) to pursue efforts to limit the temperature increase to 1.5°C'.¹

Japan's government has demonstrated political leadership, particularly on transition, through the publication of the Climate Transition Finance Guidelines, accompanying industry technology roadmaps, and a pioneering Green Transformation (GX) Plan.

Transition finance is intended to support the rapid decarbonisation of hard-to-abate sectors required to shift the whole economy onto a 1.5°C decarbonisation pathway.² This requires strong and consistent policy guidance, innovative and bold investment approaches and ambitious leadership from stakeholders across the public and private sectors.

The Climate Bonds Initiative welcomes the GX Plan as a solid foundation on which to build the transition needed to deliver on national commitments to cut Greenhouse Gas (GHG) emissions.

The GX Plan will drive forward investment in renewables, grid flexibility, energy efficiency and circular economy, supported by an upcoming sovereign bond to stimulate private sector investment.

However, some components of the GX Plan need further examination; where GHG emission-heavy fuel sources and technologies are inconsistent with global models of how to achieve 1.5°C outcomes. These components risk undermining the credibility of the transition label, attracting accusations of greenwashing.³ Key elements require strengthening to ensure alignment with science-based 1.5°C scenarios so that government targets can be met.

About the Climate Bonds Initiative

The Climate Bonds Initiative (Climate Bonds) is an international organisation working to mobilise global capital for climate action. It promotes investment in projects and assets needed for a rapid transition to a low-carbon and climate-resilient economy.

Climate Bonds promotes investor demand for climate-related financial instruments; advises governments and regulators; conducts market analysis and policy research; and administers a global Standard and Certification scheme for entities and green instruments.

Recommendations

Ensure a 1.5°C-aligned energy transition and aligned private sector action



Deep emissions cuts are required by 2030 to avoid the worst impacts of climate change; to ensure confidence and credibility, the GX Plan should be aligned with global models of how to achieve a 1.5°C pathway. Aligned private sector action will be key to its delivery.

To further strengthen investor confidence and accelerate the transition in Japan and beyond, Climate Bonds recommends the following:

1. Prioritise mature technologies

To deliver decarbonisation, the priority will be to rapidly grow mature and proven technologies: energy efficiency, grid flexibility, demand management and renewable energy. Grid limitations and curtailment regulations for dispatch need to be swiftly addressed to accelerate deployment of solar PV and wind.



2. Set a phase-out year for unabated coal

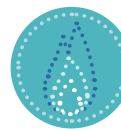
All developed countries must completely decarbonise their power sector by 2035 to achieve net zero. Clear timelines for unabated coal phase-out with full GHG decarbonisation trajectories will provide market clarity. Ammonia co-firing investments must manage NOx emissions, be restricted to using low-carbon hydrogen, and meet the coal phase-out timeline.



3. Put in place clear boundaries for any investment in gas

The role of gas in the energy transition needs to be strictly limited to those consistent with climate objectives and must address methane leakage.

The phase-out of unabated fossil fuels, including gas, must be accelerated. A full life-cycle approach to the measurement (not estimation) of emissions will be needed.



4. Strengthen requirements for hydrogen and ammonia to ensure they are low-carbon

Upfront operationalisation of clear guidance and criteria to ensure hydrogen production is sustainable from an energy, emissions, water, and supply chain perspective will be essential to developing a credible hydrogen market.



5. Ensure a strong and appropriate carbon price

A strong carbon price will need to be supported by a mandatory ETS with a clear deadline for the elimination of free allowances to drive faster decarbonisation.



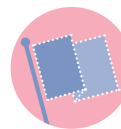
6. Enhance and expand transition plan requirements to the private sector

Delivering on government commitments will be dependent on private sector action. Requirements and guidance for comprehensive, science-based transition plans for corporates and financial institutions, will provide clarity for the market. METI's industry roadmaps accompanying the Climate Transition Finance Guidelines should be strengthened to strictly align with science-based 1.5°C pathways.



7. Build investor confidence with a bold and strictly 1.5°C aligned sovereign GX bond

A strictly 1.5°C aligned sovereign transition bond is critical to build investor confidence and to mobilise private capital for transition.



Introduction

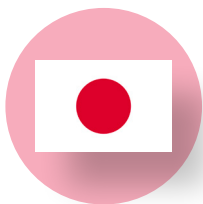
The Japanese government has set ambitious targets for decarbonisation and transformation of the country. To support this, sustainable finance is needed to facilitate investments across all sectors of the economy.

The required transformation is dependent on the work of industry and corporate entities. To meet the need for rapid transition, companies will need to develop their own science-based, coherent, and transparent plans to guide the process.

This report presents an overview of Japan's climate change and transition policy landscape, with particular attention given to the recently cabinet-approved GX Plan.⁴ The report then highlights priority areas that should be strengthened while focusing on guidance to the private sector and on transition finance.

Japan's climate policy

In October 2020, Japan's former Prime Minister, Yoshihide Suga, announced a national commitment to achieving net zero by 2050, and in April 2021, a 46% emissions reduction by 2030 from 2013 levels.^{5,6} Whilst the commitment was a considerable improvement from the previous target of 26% reductions, it still falls short of the estimated 60% reductions needed to meet the Paris Agreement.⁷ As climate change begins to impact, pressure to increase targets will most certainly grow.



In 2021, to support this more ambitious Nationally Determined Contribution (NDC), Japan published several key documents to provide the foundation for its transition. These policies, importantly, framed transition as an economic opportunity and provided guidance on stakeholder action.

The Green Growth Strategy Through Achieving Carbon Neutrality in 2050 outlined the government's commitment to rapidly reaching net-zero.⁸ This document was aimed at industry, highlighting the hard-to-abate sectors that are essential to continue economic growth but require substantial efforts to decarbonise.

A cross-ministry effort including the Ministry of Economy, Trade, and Industry (METI) launched the Basic Guidelines on Climate Transition Finance to boost investment in the low-carbon economy.⁹ The guidelines suggest investors should not only reflect on project-level emissions but also at entity level decarbonisation strategies.

The Long-Term Strategy under the Paris Agreement was developed and submitted to the UNFCCC in October 2021.¹⁰ Through this document, the Japanese government reinforced its message that economic growth and GHG emissions reductions would happen in parallel and that the transition would be science-based and fair.

The Green Transformation (GX) Plan

In February 2023, the Japanese cabinet approved the Green Transformation (GX) Plan and related legislation.¹¹



Green Transformation (GX) refers to the transformation of the entire economic and social system from an economy, society, and industrial structure dependent on fossil fuels to “structures driven by clean energy” – the aim of the initiative is to drive economic growth and development through emissions mitigation.¹²

The GX Plan aims to provide a 10-year road map for the economy-wide changes needed to cut emissions by 46% by 2030 and outline Japan's pioneering efforts in transition finance.

The GX Plan identifies and supports a range of investment opportunities, including renewable energy, improvements in energy efficiency, and circular economy measures. The policy framework also sets out the basis for an ETS from 2026 as well as a carbon levy for fossil fuel imports linked to the carbon tax. There are four core initiatives included in the GX Plan:¹³

1. Integrated regulatory/assistance promotion measures to leverage government funding and secure private investment.
2. New financing methods including transition financing and public-private investment.
3. An international development strategy, including a regional Asia Zero Emissions Community.
4. Growth-oriented carbon pricing (including GX transition bonds) to achieve USD1tn of public-private GX investment by 2033.

These initiatives cover energy, transport, industry, and finance providing targets for ambition and guidelines for action and investment. The clear policy messaging and financial support from the Japanese government, including the commitment to issue USD144bn of sovereign GX bonds to incentivise private sector investment, is extremely welcome and demonstrates global leadership.

The GX Plan aims to support corporate entities to identify and invest in the transformational changes needed to deliver on net zero. These changes need to be codified in credible transition plans that disclose the targets, the timelines, and the process of transition. The plans should also be linked to any transition finance raised to enable these investments.

The GX Plan is an excellent example of a supportive policy framework for transition, providing guidance and financial policy support

to encourage the required investments. However, certain fundamental elements need to be strengthened.

The energy transition components of the GX Plan are based on the 6th Strategic Energy Plan. The expected role of hydrogen and ammonia (produced from hydrogen) co-firing in coal-fired power plants have particularly received attention among both domestic and international stakeholders.

Hydrogen and Ammonia

In 2017, Japan launched the Basic Hydrogen Strategy, becoming the first country to develop a strategy anchored on deploying hydrogen and ammonia as alternative fuels, supported by subsidies of JPY40–70bn (USD305–534m).¹⁴

In June 2023, the strategy was updated with plans to generate JPY15tn (USD107bn) of public and private investment in hydrogen over the next 15 years.¹⁵

Low-carbon hydrogen and ammonia development is essential for climate action; but there are largely two issues that need to be addressed to ensure that they are both produced in low-carbon manners and that they contribute to climate goals:

– Thresholds for what qualifies as low-carbon:

The updated Basic Hydrogen Strategy introduced emissions intensity thresholds for what would qualify as low-carbon hydrogen on a well-to-gate basis of 3.4kg-CO₂/kg-H₂. However, this threshold is higher than emerging international requirements for low-carbon hydrogen, for example, the 1.5kg-CO₂/kg-H₂ (well-to-gate plus transportation emissions) by 2030 threshold applied by Climate Bonds.¹⁶

Using fossil fuels to generate electricity to produce hydrogen and ammonia will increase emissions compared to using fossil fuels directly.¹⁷ Hydrogen generation and ammonia production are very energy intensive, with energy losses at each stage of production and distribution. Burning ammonia can produce nitrogen dioxide (NO_x), which is a GHG 310 times more potent than CO₂, and will need to be appropriately managed.¹⁸

While the generation of hydrogen can be, if using renewable energies, low-carbon, hydrogen is still a potent indirect GHG, with up to eight times the warming potential of CO₂.¹⁹ Leakage measurement and control, throughout transportation and distribution, are essential to any hydrogen usage.



Japan's hydrogen initiatives to date have not been strictly for low-carbon hydrogen. Japan's pilot hydrogen shipments from Australia in 2022 shipped coal-generated hydrogen, while recent commitments through the Green Innovation Fund support blue hydrogen supply chain development.^{20,21}

A tougher eligibility threshold is critical to support the deep decarbonisation Japan needs.

- Timing:

The Basic Hydrogen Strategy's thresholds will only be put into operation after 2030, yet the largest emission reductions Japan needs to achieve are by 2030. As a result, there remains great uncertainty as to whether low-carbon hydrogen and ammonia can be widely deployed in the timeframe needed to achieve climate goals.

For example, current projections aim for the commercial operation of 50%+ ammonia combustion by the early 2030s and ammonia single-fuel firing (and thus the full replacement of coal-fired power) by 2050.²²

While recognising such plans are bold, the ambition is insufficient for 1.5°C alignment, as the IEA clearly states that all developed countries, including Japan, need to completely decarbonise its power sector by 2035.²³

The focus on inefficient fossil fuel-based production also raises concerns around stranded investments and high upfront emissions — exactly when Japan needs to quickly reduce emissions.²⁴

GX funding for research and development needs to have a fast transition as a necessary objective along with certainty around emissions reduction.

The goal of the GX is to make Japan a leader in low-carbon technology; until the above issues are successfully addressed through research and development, there must be caution in an approach that creates dependence on ammonia and hydrogen as energy carriers.

As deep emissions cuts are needed to meet Japan's 2030 commitments, options that can deliver quick reductions need the highest priority, in particular, faster growth of renewables.

Carbon Levy and Emission Trading Schemes (ETS)

Globally, ETS have not achieved the intended impact due to over allocation of free allowances and low carbon prices.³⁰

Early, mandatory carbon pricing with the IMF recommended minimum of USD75 per ton and a clear deadline to eliminate free allowances will be essential to drive decarbonisation at the required speed.³¹



Opportunities

The greatest opportunity for impact from the GX Plan comes from the political and financial support for energy efficiency, renewable energy, and grid improvements which offer mature, low-cost, and technologically viable options.



According to a report published by Berkley Lab in 2023, Japan can generate 70% of its power needs by 2035 with a combination of renewables, battery storage, interregional transmission systems, and energy efficiency.²⁵

Estimates by the Ministry of the Environment indicate Japan's renewable capacity is double that of generated electric energy.²⁶

These studies have also indicated the cost of renewables is comparable to the existing fuel mix.

A constant deployment of at least 10GW of renewable energy per year from 2020 to 2035 would reduce average wholesale electricity costs by 6% in 2035. If the social cost of carbon were included, the reduction might reach 36% in comparison to 2020 levels.

Most importantly, the decarbonisation of the power sector, which is the most economically feasible and straightforward, will facilitate decarbonisation of other sectors, from heating/cooling to transportation.

Transition Finance

Japan estimates that JPY150tn (USD1tn) will need to be mobilised to achieve the transition outlined in the GX Plan. To support and signal private capital, Japan intends to issue a GX Economic Transition Bond (GX Bond), on the scale of JPY20tn (USD144bn).³²

Japan's GX Bond is expected to be the first sovereign transition bond, most likely in a Use of Proceeds (UoP) format. Ensuring global investor confidence in its alignment to net zero will be critical for its success, and if robust and credible, it will demonstrate an approach that can be adopted globally.

The UoP of the GX Bond will indicate the Japanese government's definition of transition finance. As mentioned above, METI launched sectoral technology roadmaps specifically for carbon-intensive activities following the publication of the Climate Transition Finance Guidelines. The sectors covered by these roadmaps are iron and steel, chemicals, power, gas, oil, pulp and paper, and cement.³³



Gas

In past decades fossil gas has been thought of as a "transition" fuel for energy generation because direct emissions from combustion were thought to be lower than for coal-fired power generation.



However, there is growing evidence that the leakage of potent GHG methane along the supply chain creates gas power generation emissions on par with coal.^{27,28}

Because of this, investments in liquefied natural gas (LNG), unless specifically addressing emissions from existing assets, cannot qualify as transition investments without undermining the credibility of the label.

Methane emissions and leakage from the energy sector are 70% higher than official figures.^{28,29}

Short-term investments to implement full value chain leak detection and reduction technology, alongside full lifecycle assessments of carbon intensity, are critical while existing gas-related assets are slowly being phased out.

If leakage issues can be addressed, CCS could potentially offer a way to reduce emissions in the short and medium term, but in the long term, gas needs to be phased out as an energy source.

As intended, the sectoral roadmaps have been referenced in the majority of transition-labeled issuances from Japanese entities.³⁴ However, certain elements, including the lack of quantitative emissions reduction trajectories, have raised doubts regarding the robustness of the roadmaps.³⁵

It is unavoidable that elements of a transition plan remain uncertain, especially if it entails innovation and technological breakthroughs.

However, the extremely urgent need for rapid and deep cuts in emissions demands early and strong investment signals in proven technologies that can deliver without increasing emissions in the short term.

Opportunity exists to adjust and expand the transition framework as more assurance develops in technological developments and forecasts.

The proceeds of Japan's GX Bond will be earmarked for subsidies to support the transition, and the bond will be repaid with the proceeds of the Emissions Trading System (ETS), starting on a voluntary basis until at least 2026. In this way, slow movers and laggards will pay a tax to fund the transition.

Seven recommendations

Climate Bonds welcomes the pioneering initiative taken by Japan to provide clear guidance on transition finance, including the publication of the Climate Transition Finance Guidelines and accompanying industry technology roadmaps. The GX Plan presented by the government is a comprehensive policy package addressing energy efficiency, carbon pricing, auctions and decarbonisation, all of which will drive the deployment of renewable energy and reduce costs.



Private sector action is crucial to deliver on the GX plans. However, it requires further measures such as implementing economy-wide requirements and/or guidance for science-based and 1.5°C degree aligned transition plans. Both corporate and financial sector actors have a vital role to play in developing and implementing credible transition plans. To further strengthen and accelerate the transition in a direction that would build investor confidence in Japan and beyond, we recommend:

1. Prioritise mature technologies

To deliver decarbonisation, the priority will be to rapidly grow mature and proven technologies: energy efficiency, grid flexibility, demand management and renewable energy.



Systematic bottlenecks that have slowed the deployment of solar PV and wind, including grid limitations and curtailment regulations for dispatch need to be addressed swiftly and with adequate budget and support. For example, REpowerEU and the US Inflation Reduction Act both prioritise renewable scale-up to build energy security and drive front-loaded emissions cuts.³⁶

2. Set a phase-out year for unabated coal

According to the IEA, to achieve net zero, the power sector in advanced economies must be completely decarbonised by 2035.³⁷ Current projections and plans for ammonia co-firing are bold but either the timeline will need to be accelerated to meet the ambition needed, and/or further assurance in the delivery of CCUS needs to be established to ensure emissions are captured. Further assurance in the delivery of CCUS also needs to be established to ensure emissions are captured.^{38,39} Ammonia co-firing investments need to show they can be built with the technology and processes needed to minimise emissions of NOx and be restricted to using low-carbon hydrogen to avoid a catastrophic spike in methane emissions from fossil-fuel-generated hydrogen. Clear timelines for unabated coal phase-out with full GHG decarbonisation will provide market clarity and spur investments in alternatives.



3. Put in place clear boundaries for any investment in gas

The role of gas in the energy transition needs to be strictly limited to those consistent with climate objectives and must address methane leakage. The phase-out of unabated fossil fuels, including gas, must be accelerated. This will necessitate a full life-cycle approach to the measurement (not estimation) of emissions.



Support for and participation in such initiatives, as Japan has recently done, are welcome, and encouraged.⁴⁰

4. Strengthen requirements for hydrogen & ammonia to ensure they are low-carbon

The GX Plans and the recently updated Basic Hydrogen Strategy commendably indicate the need to address life-cycle emissions on hydrogen. However, pilot projects to date have delivered highly polluting fossil fuel-based hydrogen with long supply chains and high financial costs. An upfront operationalisation of clear guidance and/or criteria to ensure hydrogen production is sustainable from an energy, emissions, water and supply chain perspective will be essential to developing a credible hydrogen market for Japan and beyond.



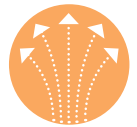
5. Ensure a strong carbon price

A strong and appropriate carbon price will need to be supported by a mandatory ETS with a clear deadline for the elimination of free allowances to drive faster decarbonisation. Early, mandatory carbon pricing with the IMF recommended minimum of USD75 per ton and a clear deadline to eliminate free allowances will be important to drive decarbonisation at the required speed.



6. Enhance and expand transition plan requirements to the private sector

Delivering on government commitments will be dependent on private sector action. Establishing requirements or guidance for comprehensive, science-based transition plans for corporates, investors and financial institutions, will deliver a clear market signal for investors and spur green investment.



METI's industry roadmaps accompanying the Climate Transition Finance Guidelines play a key role in the transition planning of corporates; the robustness and credibility of the roadmaps are thus critical. Industry roadmaps should align with science-based pathways that will deliver on Japan's 2030 legal commitments for decarbonisation and meet the G20 goal of limiting global warming to 1.5°C.⁴¹

7. Build investor confidence with a bold and strictly 1.5°C aligned sovereign GX bond

The upcoming GX Bond will have implications for the future of the transition finance market in Japan and beyond. A strictly 1.5°C aligned sovereign transition bond is critical to build investor confidence and to mobilise private capital for the transition. The transition framework can and should be adjusted as assurance matures in technological developments and forecasts.



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