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TECHNICAL NOTE ON FINANCIAL SUPERVISION AND REGULATION OF CLIMATE-RELATED ISSUES

This Technical Note on Financial Supervision and Regulation of Climate-Related Issues for the Japan FSAP was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on April 16, 2024.

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TECHNICAL NOTE

FINANCIAL SUPERVISION AND REGULATION OF CLIMATE-RELATED RISKS

Prepared By
Monetary and Capital Markets Department, IMF

This Technical Note was prepared by Peter Windsor (IMF) in the context of the Financial Sector Assessment Program (FSAP) in Japan, led by Mahvash Qureshi (IMF). It contains the technical analysis and detailed information underpinning the FSAP findings and recommendations. Further information on the FSAP program can be found at http://www.imf.org/external/np/fsap/fssa.aspx.

CONTENTS

Glossary

BCBS	Basel Committee on Banking Supervision's
BOJ	Bank of Japan
CVAR	Climate Value-at-Risk
FSA	Financial Services Agency
FSAP	Financial Sector Assessment Program
GFANZ	Glasgow Financial Alliance for New Zero
GHG	Greenhouse Gas
GX	Green Transformation
IAIG	Internationally Active Insurance Group
IAIS	International Association of Insurance Supervisors
IMF	International Monetary Fund
IPCC	United Nations Intergovernmental Panel on Climate Change
ISSB	International Sustainability Standards Board
JPY	Japanese Yen
METI	Ministry of Economy, Trade, and Industry
MLIT	Ministry of Land, Infrastructure, Transport, and Tourism
MOE	Ministry of the Environment
MSCI	Morgan Stanley Capital International
NGFS	Network for Greening the Financial System
NIES	National Institute for Environmental Studies
NZBA	Net Zero Banking Alliance
ORSA	Own Risk and Solvency Assessment
PCAF	Partnership for Carbon Accounting Financials
SBTi	Science Based Targets Initiative
SDG	United Nations' Sustainable Development Goals
SME	Small to Medium Enterprise
SSBJ	Sustainability Standards Board of Japan
TCFD	Task Force on Climate-related Financial Disclosures
UNEP	United Nations Economic Program
WBCSD	World Business Council for Sustainable Development

EXECUTIVE SUMMARY[1]

The government of Japan has pledged to substantially reduce greenhouse gas (GHG) emissions in the coming decade. Japan is among the largest greenhouse gas emitting economies in the world exposing it to significant transition risk. Although Japan's overall exposure to physical risk is considered as very high due to the changing climate and the impact of the predicted increase in the frequency and severity of natural catastrophes, its overall vulnerability to physical risks is relatively low because of its strong capacity to cope with such risks. In accordance with the United Nations Climate Change Convention, Japan has set an interim target to reduce GHG emissions by 46 percent from 2013 levels until 2030, with an objective of achieving net-zero GHG emissions by 2050. To realize this ambitious goal, Japan enacted the Green Transformation (GX) Promotion Act in May 2023 and laid out, based on the law, a comprehensive strategy to facilitate the transition to a net zero GHG economy.

Japan's transition to a net zero economy requires the decarbonization of high-GHG intensive industrial sectors such as steel. Underpinning the GX policy is the need for JPY 150 trillion of financing over 10 years to achieve decarbonization targets. Of the total amount needed, JPY 130 trillion are expected to come from private financing through financial institutions and the remaining from government's issue of GX Economy Transition Bonds. These developments frame the discussion of supervision and regulation of climate-related risks in the insurance and banking sector contained in this note.

The Japanese authorities have been working on a number of climate-related activities relevant to banks and insurers. For example, the Ministry of Economy, Trade, and Industry (METI) and the Ministry of the Environment (MOE) together with the Financial Services Agency (FSA) formulated "Basic Guidelines on Climate Transition Finance" in May 2021. The METI has developed Sector-Specific Roadmaps for GHG-intensive sectors (steel, chemicals, cement, pulp and paper, electricity, gas, oil, and automobiles). These Roadmaps provide benchmarks for the relevant sectors and for financial institutions to evaluate the efforts of their clients.

The Bank of Japan (BOJ) and the FSA conducted in 2022 a pilot climate-risk scenario analysis involving three major banks and three major non-life insurance groups. The analysis was conducted using scenarios published by the Network for Greening the Financial System (NGFS). The pilot exercise was not intended to provide a reliable assessment of quantitative impacts of climate change on the financial system, but rather to serve as a learning exercise for the supervisory agencies (FSA, BOJ) and the six financial institutions involved. The BOJ and FSA should build on the pilot climate scenario analysis and expand its scope to additional banks and non-life insurers, as well as extend the exercise to life insurers, and publish the detailed results.

Banks and insurers have identified transition and physical risks as potential sources of increasing credit risk, market risk, liquidity risk, operational risk, and reputational risk. Banks and insurers have also identified a range of opportunities related to climate change including new

[1] This Technical Note has been prepared by Peter Windsor (IMF, Monetary and Capital Markets Department, Financial Supervision and Regulation Division). The FSAP thanks the authorities for the constructive dialogue and the many insights that they have shared.

investments, reduction in energy costs, and potential new insurance products. The focus on identifying opportunities alongside and perhaps in front of measuring, managing, and monitoring climate-related risks is informed by the FSA's regulatory and supervisory approach. Such an approach is challenging to assess when compared with international standards that focus on managing risks. The climate risk analysis that has taken place as part of the FSAP systemic risk analysis[2] shows that banks are generally resilient to a transition to net zero GHG emissions by 2050 relative to a "current policies" scenario, but the banking sector's exposure to emission intensive sectors is non-negligible and constitutes, on average, about one-fifth of their assets.

Supervision and regulation of climate-related risk in the banking and insurance sector is anchored on the existing framework of powers at the FSA including Comprehensive Guidelines for supervision of insurers and major banks. The FSA's strategic priorities for July 2023-June 2024 include promoting sustainable finance by enhancing corporate sustainability disclosure and promoting dialogue between industry and financial institutions toward the green transition and impact investment. The BOJ aims to actively support financial institutions in identifying and managing their climate-related financial risks, with a view to maintaining the stability of the financial system and the smooth-functioning of financial intermediation. Notwithstanding its efforts to promote sustainable finance, the FSA needs to pay appropriate attention to effective supervision of climate-related risks to maintain financial stability in line with its policy objectives.

Discussions with FSA supervisory staff revealed that there is yet to be a systematic approach to addressing climate issues in regular supervisory interactions with banks and insurers. Supervisory discussions with senior management of banks and insurers incorporate climate-related issues on an ad hoc basis. Promulgating knowledge about climate-related risks and sustainable finance issues to front line supervisors is also a challenge. The FSA should take action to develop supervisory tools and embed climate-related risk issues in supervisory practices in a systematic way. It should also consider the training needs of supervisory staff as well as consider how best to structure internal resources to facilitate knowledge transfer related to climate issues.

The FSA set out its basic approach for supervision and inspection of financial institutions in the area of climate change as supervisory guidance. The Supervisory Guidance on Climate-related Risk Management and Client Engagement[3] (Climate Guidance) is meant to be applied in the context of the two sets of Comprehensive Supervisory Guidelines for major banks and insurers and frame supervisory discussions. The FSA needs to develop supervisory tools to proceed more effective approach in accordance with its supervisory framework, including the Climate Guidance and other Comprehensive Supervisory Guidelines.

The Climate Guidance sets out the FSA's expectations for financial institutions to support clients' and investees' responses to climate change in order to manage financial institutions' climate-related risks. With the emphasis on client engagement and assessing opportunities for business evolution of clients to assist in their decarbonization process, some of the approaches to managing risks are not elaborated. While it can be argued that risk management requirements are addressed in the comprehensive guidelines for major banks and insurers, these lack specificity for

[2] See the Japan FSAP 2024 Technical Note on Systemic Risk Analysis and Stress Testing.

[3] https://www.fsa.go.jp/news/r4/ginkou/20220712/03.pdf

climate-related risks. The FSA should review its supervisory requirements and guidance on climate-related risk management and client engagement in consideration of international principles and guidance.

Japan is leading the way in the implementation of climate-related disclosures. Companies listed on the Tokyo Stock Exchange Prime Market, which includes banks and insurers, must make disclosures based on or equivalent to Task Force on Climate-related Financial Disclosures (TCFD) requirements.[4] Since the end of fiscal year 2023, all listed companies have been required to submit securities reports including a description of their views and initiatives on sustainability. Sustainability disclosure standards are currently being developed by the Sustainability Standards Board of Japan (SSBJ) which will likely be aligned with the International Sustainability Standards Board (ISSB) Standards S1 and S2.

A review of the TCFD reports of the three major banks, three major life insurers, and three major non-life insurers reveals that disclosures vary in their depth across sectors and even within sectors. The TCFD disclosures reveal significant variability in approaches, scenarios and methodologies used to quantify climate risks. The most significant observation from the TCFD disclosures is that the quantified risks appear to be relevant for profitability in the long-term rather than a risk to solvency for all nine major financial institutions. The FSA should conduct a thematic cross-sector review of TCFD disclosures with a focus on scenario analysis and publication of a report with recommendations for improvement to ensure greater consistency.

[4] Tokyo Stock Exchange defines the Prime Market as the market oriented to companies which center their business on constructive dialogue with global investors. Criteria include market capitalization of at least JPY 25 billion on initial listing.

Table 1. Japan: Recommendations on Climate-related Risk in Supervision and Regulation		
Recommendations	**Timing[1]**	**Authorities**
Build on the pilot climate scenario analysis, and increase the scope of analysis to additional banks and non-life insurers, as well as extend the exercise to life insurers, and publish the detailed results.	MT	BOJ and FSA
Take action to develop supervisory tools and embed climate-related risk issues in supervisory practices in a systematic way.	ST	FSA
Consider training needs of supervision staff in relation to climate-related risks and how to best structure internal resources to facilitate knowledge transfer related to climate issues.	ST	FSA
Review supervisory requirements and guidance on climate-related risks management and client engagement in consideration of international principles and guidance.	MT	FSA
Conduct a thematic cross-sector review of TCFD disclosures with a focus on scenario analysis and publication of a report with recommendations for improvement and greater consistency to assist with the implementation of IFRS S1 and IFRS S2.	ST	FSA

[1] I Immediate (within 1 year); ST Short Term (within 1-2 years); MT Medium Term (within 3−5 years).

INTRODUCTION

1. Supervisory authorities across the world are working towards integrating climate-related risks into their prudential frameworks and Japan is similar in this regard. The Financial Services Agency's (FSA) approach is informed by the overall government policy to ensure economic growth through grasping transition opportunities presented by a transforming global economy, while also managing the risks of a transition to a carbon-neutral economy.

2. This technical note provides a focused review of the approach to supervision and disclosure of climate-related risks for Japanese banks and insurers. International standards and guidance are used as a reference. For banking supervision, the Basel Committee on Banking Supervision's (BCBS) *Principles for the effective management and supervision of climate-related financial risk* guide the review. For insurance oversight, the International Association of Insurance Supervisors' (IAIS) *Application Paper on the Supervision of Climate-related Risks of May 2021* guide the review.

3. [5] The analysis is part of the 2024 Financial Sector Assessment Program (FSAP) and based on the regulatory framework in place and the supervisory practices employed as of January 2024. This note is based on a review of regulations, market analyses, and meetings with the Japanese authorities, in particular the FSA. The FSAP team also met with representatives from the private sector including banks, life insurers, non-life insurers and research institutes. The work has benefited greatly from open discussions and the willingness of the authorities and private sector entities to share information.

4. The rest of the note is divided into four sections. The first section introduces the exposure of Japan to climate-related risks and elaborates on responses by policymakers as well as by private institutions. The second section summarizes the exposure of financial institutions to climate-related risks in detail. The third section reflects regulatory and supervisory responses and suggests further actions. Finally, the fourth section discusses disclosure and data, including their impact on supervision and management on climate-related risks.

CLIMATE CHANGE AND POLICY RESPONSE

A. Exposure of Japan to Climate Change

5. All economies across the world are impacted to varying degrees by the two major transmission channels of climate-related risks: physical risk and transition risk. Physical risk occurs due to the direct impact of changes in climatic patterns on economic activity. There is acute physical risk stemming from extreme short-term catastrophic events that impact the economy.

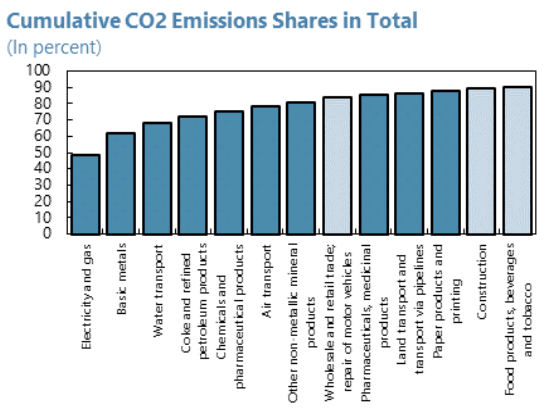
[5] The IAIS application does not cover all Insurance Core Principles which could be relevant for climate risk supervision, e.g., ICPs 14 (Valuation), 17 (Capital Adequacy), and 19 (Business Conduct) are left out. On these, the IAIS published draft application papers for consultation in November 2023.

There is also chronic physical risk where sustained changes in climatic conditions affect some sectors of the economy such as agricultural production.

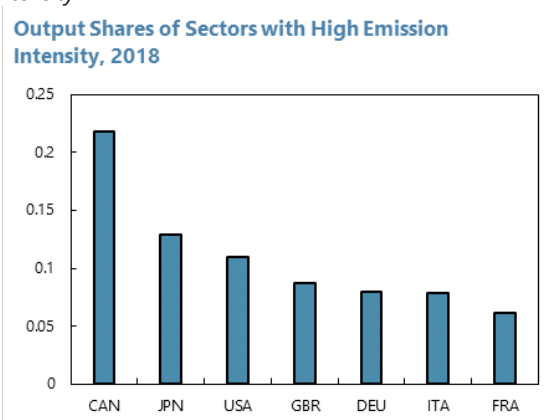
6. Japan is among the largest GHG emitting economies in the world exposing it to significant transition risk. Among the group of seven (G7) countries, Japan had the second highest output share from sectors with high emission intensity in 2018 (Figure 1). These high emission intensity sectors are also considered hard to abate sectors as they face significant technological or economic challenges in achieving decarbonization. Overall, seven emission intensive sectors are responsible for 80 percent of Japanese GHG emissions.

Figure 1. Japan: Climate Transition Risk

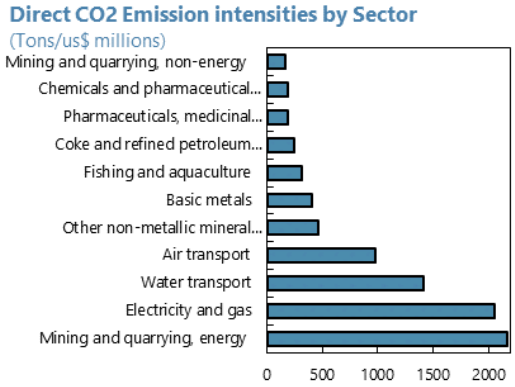
Seven emission intensive sectors account for about 80 percent of total Japanese emissions



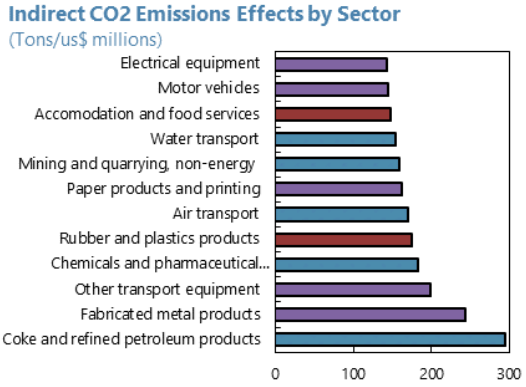
Among G7 countries, Japan stands out with the second-highest output share of sectors with high emission intensity



Direct emission intensive sectors include mining and quarrying, electricity and gas, and water transport



Sectors relying on emission intensive inputs cover a wide spectrum



Sources: Global Carbon Atlas; IMF Climate Change Dashboard (Climate Change Indicators Dashboard (imf.org)); BOJ; and IMF staff calculations.

Notes: In the top left panel, blue-gray bars represent emission intensive sectors, with light blue-gray bars representing less emission intensive sectors. In the top right panel, "Sectors with high emission intensity" refer to sectors with emission intensity that belong to the top quantile among industries in the G7 countries, comprising (45×7) sectors. In the bottom left panel, these sectors' CO_2 emission intensities are displayed in a descending order. In the bottom right panel, indirect emission intensive sectors refer to those that depend on emission-intensive inputs downstream. Blue-gray bars represent sectors that are also classified as a direct emission intensive sector; red bars refer to indirect emission intensive sectors that are distinctly considered in the subsequent analysis.

7. Japan's transition to net zero GHG emissions by 2050 requires the decarbonization of sizable high-GHG intensive industrial sectors such as steel, and as such present significant transition risks to the economy. Large scale enterprises in GHG intensive industrial sectors have underpinned the Japanese economy for decades. Transforming these sectors to meet the promises of the Japanese Government to achieve carbon neutrality by 2050 requires significant transformation. The transformation will require significant investment in the development and implementation of technology to reduce emissions. To achieve this, the Japanese economy will need to mobilize investment through financial institutions in projects and companies that will enable the transition.

8. Japan's overall exposure to physical risk is considered as very high due to the changing climate and the potential impact of the predicted increase in the frequency and severity of natural catastrophes. Based on Moody's 427 dataset, which illustrates the anticipated levels of climate physical risk for each country over the next two decades assuming no global mitigation policies, the overall physical risk score for Japan is categorized as "very high" (Figure 2).[6] When assessing individual hazards, the risks associated with hurricanes and sea level rise are deemed exceedingly high, and flood risk is classified as high. In terms of the occurrence of disasters, flood-related disasters, including storms, floods, and landslides, account for over 70 percent of major natural disasters in Japan. Damages due to floods have been increasing in recent years, indicating Japan's growing vulnerability to these climate-related events. The evolution of climate patterns is also likely to affect the viability of some sectors, such as part of agricultural production. Banks and insurers' asset portfolios are exposed to physical risk. Non-life insurers are exposed to the impact of increasing claims costs. As non-life insurers respond to these increasing costs through increasing premiums or reducing exposure to risks through underwriting decisions, the impact of the increasing cost and decreasing availability of insurance is likely to negatively impact certain geographical areas in Japan.

9. However, Japan's capacity to cope with physical risks is strong. According to the IMF's climate-driven INFORM risk indicators, Japan is recognized for its strong adaptive capabilities in dealing with climate risks. These risks are managed through the maintenance of high-quality manuals pertaining to flood control, regular updates to the "Expected Flood Inundation Area" as stipulated by the Flood Prevention Act, and the implementation of innovative flood prevention measures.[7] Consequently, Japan's overall vulnerability to climate physical risks is relatively low compared to other countries. Nevertheless, the possibility of climate-related disasters persists due to erratic changes in weather patterns, including the increasing frequency of extreme precipitation.

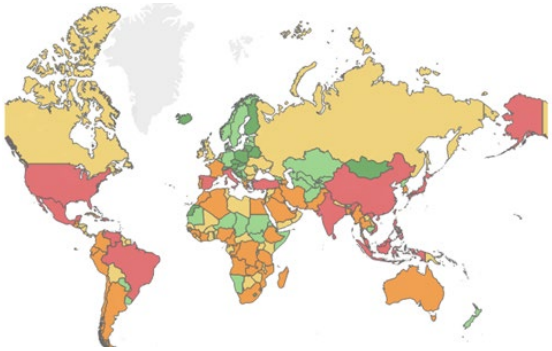
[6] Charts repeated from Japan FSAP 2024 Technical Note on Systemic Risk Analysis and Stress Testing.

[7] "Expected Flood Inundation Areas" commenced to be made public in 2001 following the revision of the Flood Prevention Act. These areas were designated based on maximum possible rainfall occurrences, such as those expected once in 1,000 years. An example of innovative flood prevention initiatives is the construction of one of the world's largest underground discharge channels, situated near Tokyo. This channel effectively channels overflow from small to mid-size rivers, redirecting it through a 6.3-kilometer tunnel located 50 meters below ground to the larger Edogawa River.

Figure 2. Japan: Climate Physical Risk

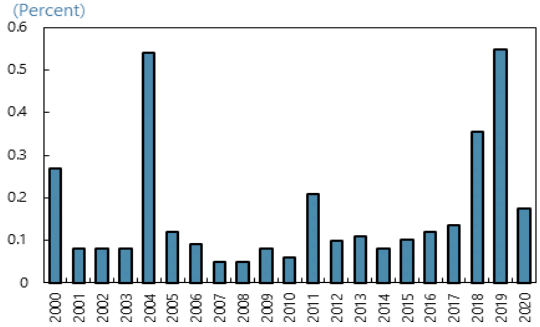
Japan's overall exposure to physical risk is considered as very high.

Heatmap for Climate Physical Risk (Risk Index)



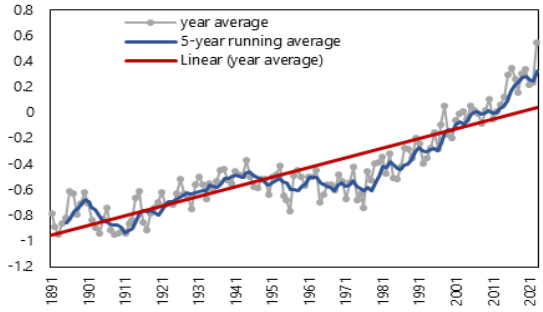
Flood damages have been rising in recent years…

Flood Damage Relative to National Income
(Percent)



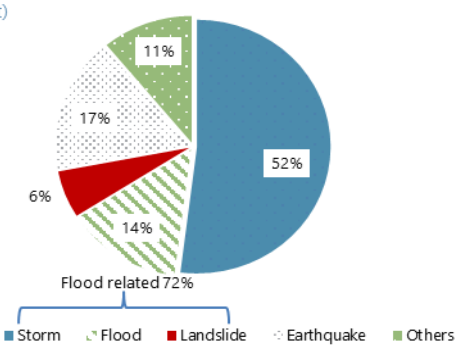
Global average surface temperatures have risen at a rate of about 0.76°C per century…

Annual Global Average Temperature Anomalies
(Temperature Anomaly *C)



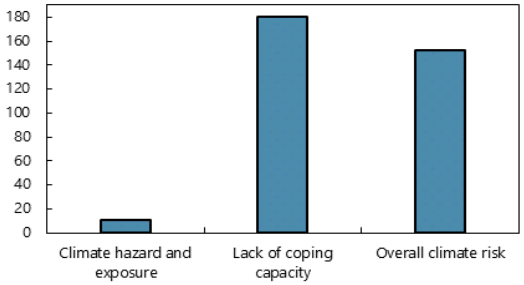
Flood-related disasters account for over 70 percent of major natural disasters in Japan.

Occurrence of Disasters in Japan by Type
(Percent)



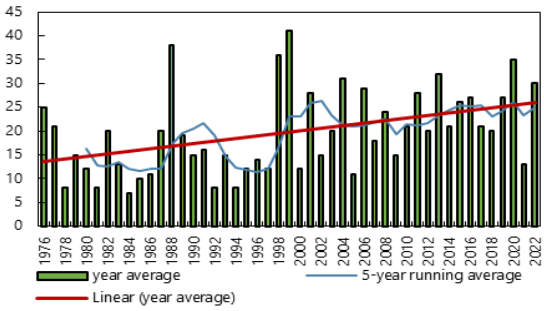
But Japan is recognized for its strong adaptive capability in dealing with physical risks.

Japan's Ranking in Climate Driven INFORM Risk Indices
(Rank)



The annual number of global heavy rain events has increased significantly.

Annual Number of Events with Precipitation over 80mm/hour (Number of events)



Sources: Moody's 427; EM-DAT; Flood damage statistics from Ministry of Land, Infrastructure, Transport, and Tourism (MLIT); the European Commission Disaster Risk Management Knowledge Center; Japan Meteorological Agency; and IMF staff calculations.
Note: The ranking in the middle right panel is out of 191 countries, with a lower rank indicating greater risk.

10. Litigation risk is gaining prominence among corporations and governments. The United Nations Economic Program (UNEP) reports that, as of December 2022, there have been 2,180 climate-related cases filed in 65 jurisdictions. This compares to 884 cases in 2017 and 1,550 cases in 2020 when the UNEP conducted similar analyses. Of the 1,522 cases reported by the UNEP as of December 2022, five were in Japan. A prominent case in Japan was Citizens' Committee on the Kobe

Coal-Fired Power Plant (CCKCPP) v. Japan (2023). In that case, the Osaka District Court rejected a request for an injunction to prevent the construction and operation of two new units at a coal-fired plant in Japan with the CCKCPP arguing that the project was inconsistent with Japan's 2030 and 2050 climate targets. Despite CCKCPP's lack of success in that case, it has filed a case against two companies planning the project (Citizens' Committee on the Kobe Coal-Fired Power Plant v. Kobe Steel Ltd., et al. 2023). Financial institutions are recognizing these risks in their climate disclosures. The NGFS report *Climate-related litigation: recent trends and developments* set out evidence of rapid growth in climate-related litigation in terms of the volume of cases being initiated, more sophisticated legal arguments and the wide range of entities caught in litigation for climate issues.[8]

B. Government's Response and National Coordination

11. The Japanese government has pledged to substantially reduce GHG emissions in the coming decade. It announced in October 2020 a goal of achieving carbon neutrality by 2050, in line with the United Nations Intergovernmental Panel on Climate Change (IPCC) Special Report *Global Warming of 1.5^{0}C.*[9,10] In April 2021, a further goal of reducing GHG emissions by 46 percent by 2030 when compared to 2013 levels was announced.[11]

12. In February 2023, the Japanese government announced its policy for Green Transformation (GX). GX policy will transform Japan's industrial and social structures, which have been based on fossil energy sources into those based on clean energy. GX policy addresses both demand for energy through efficiency improvement and access to renewable energy sources and nuclear energy to achieve decarbonization of the economy. Underpinning the GX policy is the need for JPY 150 trillion of financing over 10 years to achieve decarbonization targets. It is expected that JPY 20 trillion of that investment will come from the government through the sale of GX Economy Transition Bonds.[12] The proceeds will be invested in switching to renewables, nuclear and other non-fossil energy, structural transformation, and fundamental promotion of energy efficiency improvement in key industries, research and development on resource recycling, carbon storage and other technologies leading to decarbonization. This investment may be offered along with subsidies and loan guarantees and may supplement other financing from financial institutions. The Japanese government views an important role for banks, insurers, and other investors to fund the transition towards decarbonization, and considers that availability and credibility of transition related

[8] https://www.ngfs.net/en/communique-de-presse/ngfs-publishes-two-complementary-reports-climate-related-litigation-risks

[9] https://www.ipcc.ch/sr15/

[10] Prime Minister Suga's Policy Speech to the 203rd session of the Diet.

[11] Announcement at the Global Warming Prevention Headquarters and the Leaders' Summit on Climate hosted by the United States.

[12] These will be issued according to the "Japan Climate Transition Bond Framework", and an initial sale of JPY 1.6 trillion of the labelled Japan Climate Transition Bonds occurred in February 2024. https://www.mof.go.jp/english/policy/jgbs/topics/JapanClimateTransitionBonds/climate_transition_bond_framework_eng.pdf.

information, including thorough transition plans supported by credible pathways, is important for an orderly net-zero transition.

13. The METI and MOE together with the FSA formulated "Basic Guidelines on Climate Transition Finance" in May 2021. These guidelines set out basic requirements for credible transition finance. The definition of transition finance does not focus solely on the use of proceeds and KPIs, but rather on the company's "transition strategy" toward decarbonization and the credibility and transparency of implementing that strategy. Transition Finance must meet four elements of these Basic Guidelines. For Element 1, the issuer must have transition strategies aligned with the goals of the Paris Agreement with the intention to transform business towards decarbonization and incorporation of 'just transition' elements of environment and social contributions. The issuer must also have disclosures aligned with TCFD recommendations or similar frameworks. Element 2 requires that initiatives covered by the issuer's transition strategy to be core business activities that are environmentally material. Element 3 is that the issuer's climate transition strategy must be science-based including targets and pathways. Element 4 is implementation transparency so that capital expenditure and operational expenditure are set out and quantitative indicators of progress are set out where possible and if not possible the use of external certification systems for qualitative assessment.

14. The METI has developed sector-specific Roadmaps for GHG-intensive sectors (steel, chemicals, cement, pulp and paper, electricity, gas, oil, and automobiles). These Roadmaps provide benchmarks for those sectors to refer to and for financial institutions to evaluate the efforts of their clients. The Roadmaps present a chronological list of decarbonization technologies for each sector to achieve carbon neutrality by 2050. The Roadmaps set out policy support, emission reduction effects, industry characteristics, and the prospects of technologies to reduce emissions. The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) published with the cooperation of stakeholders a "Roadmap to Zero Emissions from International Shipping," which is the benchmark for companies in that sector to refer to when promoting decarbonization efforts. It has been used as a benchmark for the issuance of a transition bond based on the issuer company's transition plan with the proceeds being used to develop offshore wind power generation, ships using ammonia and hydrogen fuel and other projects.

15. A report titled "Addressing the Challenges of Financed Emissions" was published in October 2023 by Japan Public and Private Working Group on Financed Emissions to Promote Transition Finance (Financed Emissions Working Group).[13] The working group consists of 10 members from internationally active financial institutions including large banks and life insurers. The group was convened by the METI, the MOE, and the FSA in February 2023. The Challenges of Financed Emissions report seeks to address the professed problem that relying solely on current financed emissions figures in disclosures by financial institutions may pose challenges in accurately evaluating the strategies and actions of those financial institutions and companies for future emissions reduction. The report sets out approaches for financial institutions to comprehensively

[13] https://www.meti.go.jp/press/2023/10/20231002002/20231002002-2rr.pdf.

disclose their contributions to decarbonization. The aim is for financial institutions to effectively demonstrate quantitative and qualitative capabilities for executing medium- to long-term transition taking the focus away from short-term fluctuations in financed emissions.

16. The Challenges of Financed Emissions report sets out approaches to calculation and disclosure of financed emissions and the use of multiple metrics in disclosures. The report acknowledges that suitable methodologies for calculation and disclosure of financed emissions are still under development and discussion as well as the definition of transition finance still being under development. The report uses the definition of transition finance as financing of hard-to-abate sectors where options available to decarbonize are technologically and economically limited. The report references the work of a number of international bodies including the Glasgow Financial Alliance for Net Zero (GFANZ), Partnership for Carbon Accounting Financials (PCAF), the Net Zero Banking Alliance (NZBA), World Business Council For Sustainable Development (WBCSD), and Science Based Targets Initiative (SBTi).

17. The Challenges of Finance Emissions report advocates that in addition to disclosure of total financed emissions other key financed emissions figures could be disclosed. These additional financed emissions metrics could include carbon intensity, separate reporting of financed emissions related to transition finance or 'the use of proceeds' approach separating emissions into emissions attributed to transition assets and other emissions on a per financed entity basis. In addition to financed emissions metrics, the report advocates additional metrics such as:

- avoided emissions
- the absolute or proportional amount of a financial institution's portfolio aligned with net zero targets or the Paris Agreement
- temperature ratings
- the amount or proportion of financed entities with credible transition strategies or related project
- future GHG reduction effects through transition finance
- physical metrics for example the number of decarbonization-related project financed and
- decarbonization contribution based on work currently being done by GFANZ.

C. FSA and BOJ Initiatives

18. The FSA and BOJ conducted a Pilot Scenario Analysis involving three major banks and three major non-life insurance groups (Box 1). Detailed results of the scenario analysis were not released given the pilot nature of the exercise. A high-level comparison against the banks' reported scenario analysis results in TCFD disclosures was provided but there was not a similar comparison for non-life insurance groups. The scenario analysis could be developed further based on the Technical Note on Systemic Risk Analysis and Stress Testing and IMF's Staff Discussion Note

Approaches to Climate Risk Analysis in FSAPs.[14] Important comparisons with the work of other jurisdictions could be derived from the joint FSB-NGFS paper *Climate Scenario Analysis by Jurisdictions*.

19. Another scenario analysis exercise is planned for FY 2024 with publication of results approximately a year later. The specifics of this scenario analysis exercise were in development at the time of the mission. One known development is that the General Insurance Rating Organization of Japan's risk models will be used as a unified risk modelling tool in the next scenario analysis for non-life insurers. The intention is to continue with the same scope of banks and non-life insurance groups. It would be useful to expand on the pilot scenario analysis to increase the scope to include additional banks, non-life insurers and life insurers in the medium term and publish detailed results. This may not be possible for the imminently planned exercise but should be considered for future regular scenario analysis exercises. There will be benefits in terms of increasing the capacity of the financial sector to address climate-related risks if more entities are included in the exercises.

20. Recommendation 1: The BOJ and FSA should build on the pilot climate scenario analysis, increase the scope of analysis to additional banks and non-life insurers as well as extending the exercise to life insurers for climate-scenario analysis exercises subsequent to the FY2024 exercise, and publish the detailed results.

21. The FSA conducted an experimental analysis of climate-related financial risks for regional banks based on data collected from 49 regional banks.[15] The analysis was used to better understand the characteristics of climate-related financial risks. There were three components of the analysis: (1) analysis of financed emissions of regional banks using the CO_2 gas inventory compiled by the National Institute for Environmental Studies (NIES) based on IPCC guidelines; (2) analysis on exposure to engine-related companies that may be affected by the shift to electric vehicles and (3) visualization of flood risks on banks using borrower address information and hazard map data. The analysis of financed emissions of regional banks found that regional banks financed emissions had relatively lower contribution from high-emission industries compared to economy-wide emissions. It is postulated that this is because those industries involve large enterprises more likely to be financed by major banks. Significant regional differences were found leading to advice that regional banks efforts to reduce financed emissions need to be based on their individual portfolios rather than uniformly prioritizing high emitting industries. The analysis of engine-related companies was restricted to small and medium-sized enterprises (SMEs) and the flood risk analysis was based on the location of head offices of companies financed by regional banks not the location of all of their plants and offices. The FSA used the analysis as a learning exercise to identify improvements to data infrastructure and to facilitate dialogues with financial institutions.

[14] https://www.imf.org/-/media/Files/Publications/Staff-Climate-Notes/2022/English/CLNEA2022005.ashx.

[15] https://www.fsa.go.jp/en/news/2023/20230929-2/04.pdf.

Box 1. Japan: FSA and BOJ Pilot Scenario Analysis

In August 2022, the BOJ and FSA published a paper that detailed some lessons learned from a pilot scenario analysis involving three major banks and three major non-life insurance groups. The scenario analysis was conducted using scenarios published by the Network for Greening the Financial System (NGFS). This exercise was conducted in response to recommendations by the Expert Panel on Sustainable Finance.

As this was a pilot exercise, it was not intended to provide a reliable assessment of quantitative impacts of climate change on the financial system or the six financial institutions involved. It was intended as a learning exercise for the FSA, BOJ and the six financial institutions involved.

The Pilot Scenario Analysis was based on a bottom-up approach with the FSA and BOJ laying out the basic framework with NGFS Scenarios: Net Zero 2050, Delayed Transition and Current Policies. The table below sets out an overview of the scenario analysis and is copied from the BOJ and FSA paper.

	Transition risk	Physical (acute risk)
Scenarios	Net Zero 2050; Delayed transition; Current policies	Net Zero 2050; Current policies
Impacts to be considered	Impacts of policies and regulations, technological innovations, market changes arising as responses to climate change to climate change.	Damage to assets and collateral due to floods, suspension of business activities (Wind damage if possible)
Analysis period and scope	2021-2050 (every five years) Domestic and overseas credit (Credit risk)	- 2050, - 2100 Domestic Credit (Credit risk)
Analytical approach	1. Sectors with significant impacts of climate-related risks ¬ Conducted analysis using individual companies or sample companies of each industry type 2. Other sectors ¬ Analysis using macroeconomic indicators is also possible	Not specified

The results of banks' scenario analysis indicated that banks' estimated increase in annual credit costs was considerably lower than their average annual net income. However, as is generally the case in climate-related risk analysis, the estimated results significantly depend on analytical models, selection of variables for those models and additional assumptions made in the exercise. Assumptions varied about how clients' businesses will transform, how technology will evolve, the extent of transition financing required by clients and the extent that carbon prices can be passed on to the selling prices of products made by clients. This demonstrated that ensuring comparability through encouraging the use of common assumptions will enhance understanding through horizontal reviews of scenario analysis. The exercise also showed that banks had the capacity to undertake the risk analysis based on common scenarios not just those they chose for their own TCFD reports.

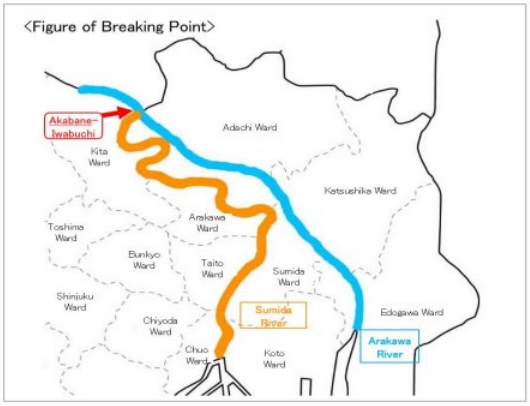
The scenario analysis for the non-life insurance groups focused on physical risks and their impact on underwriting risks. The specific physical risks analyzed were acute risks caused by typhoons and floods.

A bottom-up approach to scenario analysis was adopted based on scenarios prepared by the FSA. The non-life insurance groups used the risk models they actually use in practice to measure the risk amount.

Box 1. Japan: FSA and BOJ Pilot Scenario Analysis (concluded)

The scenarios used were based on past disasters with intensified magnitude, the scenarios did not take into account the impact of future climate change per se. Typhoon risk was based on Typhoon Vera from 1959. Central pressure in the typhoon system was lowered in several patterns based on future projections in the scenarios and a second route of impact was also applied where the typhoon's impact was shifted eastward to hit the Tokyo metropolitan area (the Metropolitan route).

Flood risk was taken from each insurance group's risk model based on what most closely resembled the Arakawa River flooding scenario with a breach point of the embankment of the river at the 21-kilometer point on the right embankment (Akabane-iwabuchi), which is used by the Ministry of Land, Infrastructure, Transport and Tourism in its Arakawa river flood assumption. The amount of rainfall and river flow were intensified based on future projections. See figures below from the BOJ and FSA paper.



Overall results were not mentioned for the non-life physical risk scenarios, there are no comparisons to TCFD disclosures. However, it was disclosed that claims payments were found to increase for typhoons as central pressure dropped and for floods as rainfall and river flow intensified. Increases in projected claim payments was smaller for flooding than the typhoon due to the assumed point of the embankment breach and its surrounding topography. Key learnings were that results varied due to differences in risk models and differences in assumptions and analysis sampling a specific disaster cannot capture changes in the probability of occurrence of that specific disaster in the future. Stochastic analysis using the same risk model would be desirable. The FSA stated that it would promote discussions about the use of risk models owned by the General Insurance Rating Organization of Japan for scenario analysis in future exercises to remove the differences in models and to upgrade to stochastic analysis.

The FSA and BOJ will continue the dialogue with financial institutions about methods and practical application of scenario analysis. A further scenario analysis exercise is planned to be launched within the next year.

22. The BOJ has created a lending facility for banks for green loans/bonds or sustainability-linked loans/bonds and transition finance. The program provides loans against pooled collateral. The facility is a one-year facility with rollover possible until FY 2030. It conducts twice yearly auctions for these funds and the interest rate offered is 0.1 percent after the Monetary Policy Meeting during March 18-19, 2024 (the previous rate was zero percent). The BOJ had

disbursed JPY 8.2 trillion through this facility as of January 30, 2024.[16] The BOJ does not have a taxonomy for green loans/bonds, sustainability-linked loans/bonds or transition finance. In Japan, the discussion on standards and taxonomies with regard to the response to climate change is still in flux. Therefore, the BOJ relies on banks' own definitions of green/sustainable/transition finance based on international standards or the Japanese government's guidelines. The BOJ requires banks to disclose criteria with which they determine which investment or loans can be used for the operation to provide market discipline. The BOJ requires banks using the facility to meet the TCFD disclosure requirements. There are 81 eligible counterparties for the facility.

23. The BOJ does not judge the eligibility of individual investments or loans. It does not get directly involved in how the funds are used because it selects financial institutions that organizationally engage in investment or loans to address climate change under appropriate governance.

24. An article in the Bank of Japan Review, published in March 2022, assessed physical risks from climate change faced by Japan's financial institutions.[17] The article considered the impact of floods on the real economy, land prices and financial institutions' financial conditions. The empirical analysis found that the indirect effect of flooding damage on the real economy, land prices, and the financial condition of financial institutions has not been sizable. However, when taking into account consideration of possible climate change and increasing in flood damage in the future, the indirect effect may have a non-negligible impact on real GDP and the financial condition of financial institutions. The article also pointed out that the impact of physical risks is uncertain with dependencies on many factors, including the pace of decarbonization, interactions between global average temperature increase and the frequency and scale of disaster, and subsequent impact on the real economy.

25. The BOJ reported on the efforts of regional and Shinkin Banks to address climate change in an Annex to Financial System Report in June 2023.[18] Regional banks are increasingly offering support to client firms in their efforts to address climate change by providing financial and non-financial services. These services provide regional and Shinkin banks with new profit opportunities and reduce their own climate-related financial risks. Regional banks have many SMEs as clients. An investment decision to take measures to reduce GHG emissions is often material to that business. About 70-80 percent of regional banks are already focusing on fostering awareness among their client firms through non-financial services, such as holding seminars, as well as supporting the introduction of Sustainable Development Goals (SDG) management by providing support for the formulation of SDG declarations and evaluation services for SDG efforts. The annex reports that more than 20 percent of all SMEs plan to measure their GHG emissions within the next few years and regional banks moved into providing emissions measurement services and consulting

[16] https://www.boj.or.jp/en/mopo/mpmdeci/mpr_2024/mpr240129a.pdf.

[17] https://www.boj.or.jp/en/research/wps_rev/rev_2022/data/rev22e02.pdf.

[18] https://www.boj.or.jp/en/research/brp/fsr/data/fsrb230602.pdf.

services for developing reduction targets and plans. The annex points out that more than 70 percent of regional banks are making efforts in this direction.

VULNERABILITY OF JAPAN'S FINANCIAL SYSTEM TO CLIMATE RISK

26. The FSA identifies that climate-related factors can be drivers for several traditional financial risks. Table 2 below sets out some examples of how climate-related risks can impact financial risks.

Table 2. Japan: Examples of How Climate Change Can Be Drivers of Traditional Financial Risks

Risk factors	Example of event	Climate change risk
Credit risk	Collateral value and creditworthiness of mortgage loans deteriorated due to damage from extreme weather.	Physical (acute)
	Uninsured mortgage loans in coastal area due to rising sea level, leading to deterioration in collateral value and creditworthiness	Physical (chronic)
	Deterioration in creditworthiness of business partners due to introduction of GHG emissions regulations including taxes.	Transition
	Turning coal-fired power stations into stranded assets by avoiding fossil fuels	Transition
Market risk	Losses arising from volatile financial markets and/or commodity market due to extreme weather events.	Physical (acute)
Insurance underwriting risk	Increased the frequency, severity and concentration of weather-related insurance claims caused by climate change.	Physical (acute)
	Risk of underestimating the risks to which an insurer is exposed in writing a particular insurance policy due to lack of consideration for the impact of climate change.	Transition
Litigation risk	Risk of face class action suits for breaching of duty of care with respect to investments and loans for fossil fuel sectors.	Physical & Transition
Tangible assets	Risk of damage to stores and business offices due to extreme weather.	Physical (acute)
Reputational risk	Risk of reputational damage to the Group's brand value due to harmful rumors relating to measures to address global warming or investments and loans for industries related to fossil fuels.	Physical & Transition

Source: FSA.

27. This section relies on banks and insurers' TCFD disclosures as well as findings from the Climate Risk Analysis, conducted as part of this FSAP.[19] The FSAP risk analysis found that the banking sector's exposure to emission intensive sectors is non-negligible and constitutes, on average, about one-fifth of their assets. Banks generally appear resilient to a transition to net zero GHG emissions by 2050 relative to a "current policies" scenario. There is, however, some

[19] See Japan FSAP 2024 Technical Note on Systemic Risk Analysis and Stress Testing.

heterogeneity in the transition risks for banks, with the capital positions of regional banks in the sample affected relatively more than of other banks. In terms of physical risks, a high-level analysis shows that about one-third of physical assets are at risk of flooding in Japan, with significant variation across prefectures. The future damage rate is also expected to increase notably in some regions. Available climate adaptation indicators, however, suggest that Japan has a strong capacity to cope with extreme weather events. That said, the long-time horizon over which the physical and transition risk analysis must be undertaken does create significant uncertainties so the risk analysis presented below must be considered with those caveats in mind.

A. Physical Risk

Banks

28. Banks have identified physical risk as potentially leading to increasing credit risk, market risk, liquidity risk, operational risk, and reputational risk. Credit risks can increase due to deterioration in clients' financial performance or impairment of collateral assets due to natural disasters. An example of market risk can occur due to declines in strategic holdings of stocks of clients due to deterioration of financial performance due to impacts of natural catastrophes. Liquidity risk can occur if depositors withdraw funds due to the impact of natural catastrophes. Operational risk can occur due to business interruption due to damage to the banks' own headquarters or branches after a natural catastrophe and the costs of recovery from that natural catastrophe. Reputational risk is a concern if customers cannot access the banks services for an extended period of time due to the impact of a natural catastrophe.

Insurers

29. Japanese non-life insurers identify both acute and chronic physical risks. While their own scenario analysis disclosed in TCFD reports focus on acute physical risks, they do acknowledge in their risk identification the potential for chronic physical risks to impact on their businesses. Acute physical risk occurs due to the growing frequency and severity of catastrophic climate-related events such as typhoons and floods. Chronic physical risks occur due to a rise in temperature affecting weather patterns such as increasing droughts and heat waves, rising sea levels, and increasing infectious diseases. These changes in weather patterns may lead to issues in estimating claims costs and therefore premium rates that non-life insurers need to charge to meet the risks.

30. Increasing claims and benefits to be paid by Japanese life insurers is considered a risk due to increases in heatstroke and infectious diseases associated with global warming. Rising temperatures may lead to increasing deaths (increase in mortality rates) and increase in hospitalizations.

31. Japanese life insurers identify both acute and chronic physical risks as risks to their investment portfolios. They identify the possibility of losses at investee companies due to increasing frequency and severity of natural catastrophes. In the long-term they also consider the possibility of losses to investee companies from more extreme fluctuations in weather patterns.

B. Transition Risk

Banks

32. Banks have identified transition risk as a risk driver for credit risk, market risk, liquidity risk, and operational risk. Credit risk can increase due to deterioration of client business performance due to declining revenues or increasing costs related to the decarbonization of the economy. Similarly, market risk can be heightened for example due to the risk of declining value of strategically held stocks due to declining business performance of those clients due to increasing costs or falling revenues related to decarbonization of the economy. Banks have identified transition risk as linked to liquidity risk if their reputation is harmed due to perceived inaction on climate issues or declines in credit ratings due to delayed action on transition risks and also increased outflows of funds to clients because of the need to invest to address decarbonization of their business. Increasing operational risk is seen as coming from increasing litigation risk (see below).

Insurers

33. Japanese insurers identify multiple sources of transition risk, mainly related to their investment portfolios. Transition risk will lead to increasing market and credit risks. Examples include policies and regulations to address climate change leading to loss of value of invested assets and price volatility of invested assets due to technological innovations (e.g., investee companies not adequately investing in technological innovation). Changes in consumer behavior are considered risks to investment portfolios. Reputational damage to insurers is also considered a risk if the insurer's efforts to address climate change are perceived as inadequate.

C. Litigation Risk

Banks

34. Banks have identified litigation as a potential source of increasing operational risk. The issue identified is stakeholders filing lawsuits against the banks due to inaction on climate change issues or the costs of regulatory action for failure to comply with regulations related to climate issues.

Insurers

35. Non-life insurers identify possible exposure to litigation risk through their liability insurance portfolios. In particular, Property Owner's Liability Insurance and Directors and Officer's Liability Insurance are identified as products exposing insurers to litigation risks. Insured companies and insured directors may be subject to lawsuits related to failure to take action to address climate change issues. One non-life insurer identified climate litigation as a medium likelihood, medium impact risk to its investment portfolio. One major life insurer has identified litigation as a source of increasing operational risk similar to how the major banks have identified this risk.

D. Opportunities[20]

36. Banks have identified increased demand for capital investment as an opportunity related to the acceleration of net zero initiatives in various industries. Transition finance or sustainable finance are recognized as business opportunities by banks. For example, financing of renewable energy businesses is a new opportunity. This view is supported by the Japanese government's GX policy that identifies the need for JPY 150 trillion of public and private investment over ten years to achieve decarbonization targets.

37. Life insurers see opportunities for increases in investment and loan opportunities that contribute to resolving climate change issues. For example, opportunities for investments and loans to renewable energy businesses. Life insurers also see opportunities in reduced operating costs through the introduction of infrastructure with higher resource efficiency. There may be opportunities in making investments with companies with increased competitiveness due to development of new low-carbon technologies or companies with products and services that face increased demand due to changes in consumer behavior and preferences linked to climate change. Some life insurers also see the possibility of growing demand for new insurance products and services to address the needs of customers experiencing increasing economic anxiety due to the impacts of climate change.

38. Non-life insurers see a range of opportunities from new products and services to new markets and resource efficiency. Non-life insurers have identified new products and services, not just new non-life protection products but also need for consulting services related to decarbonization and disaster prevention. Non-life insurers identify the potential for new markets and new or rapidly growing industries are created to address decarbonization. The reduction in costs is an opportunity from more efficient use of resources, including energy efficient buildings and low-cost renewable energy.

39. It is notable that particularly life insurers are using the MSCI Climate Value-at-Risk (CVAR) methodology for scenario analysis that attempts to incorporate opportunities as well as risks into the scenario analysis. This is an attempt to consider the quantitative impacts of opportunities. The MSCI CVAR methodology is an evolving methodology and at least one life insurer mentions significant revisions in its 2023 TCFD report.

REGULATORY AND SUPERVISORY RESPONSES

A. Supervisory Responsibilities, Powers, and Functions

40. Supervision and regulation of climate-related risks in the banking and insurance sector is anchored on the existing framework of powers at the FSA. The FSA is the integrated regulator

[20] This section explains how Japanese financial institutions are looking at climate-related issues. Note that to the extent that opportunities for additional services that a bank or insurer can offer in the form of advice on transition, that exposes the bank or insurer to risks related to offering those services.

of financial services, including banking and insurance. The FSA conducts both prudential oversight and business conduct regulation and supervision for all finance sectors. See the Technical Note on Selected Issues in Banking Supervision and Regulation and the Detailed Assessment of Observance of the Insurance Core Principles for discussion of the objectives and mandate of the FSA.

41. The FSA's strategic priorities for July 2023-June 2024 include promoting sustainable finance, by enhancing corporate sustainability disclosure and promoting dialogue between industry and financial institutions toward the green transition and impact investment. This priority was set out in the context of its broad strategic priority of 'Build the Financial System for Achieving Economic Growth and Resolving Social Issues'. The FSA is of the view that in order to truly manage risks from climate change within the financial sector, climate change vulnerabilities need to be addressed in the real economy and that the banking and insurance sectors need to work with their clients and investees to transform their businesses towards decarbonizing and this can only be achieved through financing of the transition.

42. The BOJ set out its strategy on climate-change in 2021.[21] The BOJ aims to actively support financial institutions in identifying and managing their climate-related financial risks, with a view to maintaining the stability of the financial system and the smooth-functioning of financial intermediation. This includes addressing climate-related issues through on-site examinations and off-site monitoring. Preceding the release of its strategy, the BOJ also set up the Climate Coordination Hub (CCH) as an internal network, to promote information sharing and coordination on various measures and address issues related to climate change.

43. An example of the BOJ's research to assist banks in identifying climate-related financial risks was a December 2023 paper setting out the results of top-down scenario analysis over a shorter than usual time horizon of 5 years.[22] The paper was titled *Top-Down Scenario Analysis of Climate-Related Financial Risks: Perspective from Time Horizon and Inter-Industry Spillovers*. The paper examined to cases of firms adjustment to carbon price increases: a smooth adjustment case and a slow adjustment case. The paper also examined inter-industry spillovers. The paper found the degree of firm adjustments to higher carbon prices had substantial effects on the credit cost ratios of banks and that the carbon price increase not only impacts directly affected sectors but also other sectors through inter-industry linkages. The key issue from this latter finding is that regional banks with small exposures to sectors directly impacted by higher carbon prices may still need to pay close attention to transition risk through these inter-industry exposures.

B. Supervisory Resources and Capacity

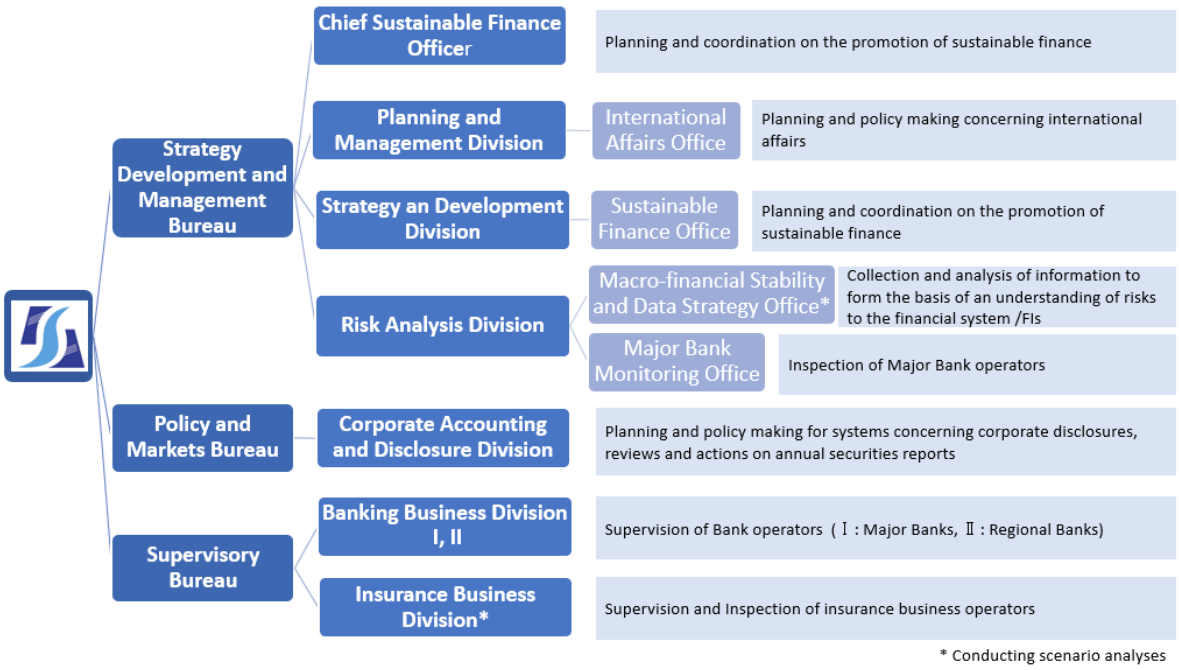
44. The FSA has appointed a Chief Sustainable Finance Officer and established a Sustainable Finance Office within the Strategy and Development Division. Figure 3 provides an overview of sustainable finance responsibilities within the FSA. The Chief Sustainable Finance Officer is responsible for overall planning and coordination of sustainable finance matters with the FSA. The

[21] https://www.boj.or.jp/en/about/release_2021/rel210716b.htm.

[22] https://www.boj.or.jp/en/research/brp/ron_2023/data/ron231221a.pdf.

Sustainable Finance Office acts as a hub for sustainable finance matters. The Sustainable Finance Office has been bolstered through hiring experts that were external to the FSA and there is ongoing organic development of staff.

Figure 3. Japan: FSA Organization Chart for Sustainability Issues



Source: FSA.

45. The Risk Analysis Division has a key role in assessing climate-related risks. The Macro-financial Stability and Data Strategy Office is responsible for conducting scenario analysis and has been working with the BOJ to develop climate scenario analysis. The Major Bank Monitoring Office conducts analysis and discussions with major banks about climate-related issues.

46. The Policy and Markets Bureau engages with sustainable finance disclosures through the Corporate Accounting and Disclosure Division. This division is engaging with the Sustainability Standards Board of Japan in its consideration of the implementation of sustainability disclosures consistent with standards developed by the International Sustainability Standards Board. The Division has also developed requirements for mandatory sustainability-related information in annual securities reports based on the TCFD pillars from FY 2022. At the time of the mission, the division was engaged in the analysis of the first of these reports from approximately 4000 listed companies in Japan which were received in relation to years ended 30 March 2023.

47. Promulgating knowledge about climate-related risks and sustainable finance issues to front line supervisors is a challenge. The Climate Guidance was only released in 2022. The process of informing supervisory staff about how to address climate-related risks is ongoing. There is no intention for all supervisors to be equipped with climate-related expertise. The aim is to put in place

experts within supervisory functions in the Risk Monitoring Office and Supervisory Bureau. The FSA has the ambition to enhance expertise and knowledge on climate-related risks but it has no specific strategy to achieve that objective at this stage. There is recognition that climate-related risk skills need to be enhanced and the FSA is contemplating how to achieve that goal.

48. Discussions with FSA supervisory staff revealed that there is yet to be systematic approach to addressing climate issues in regular supervisory interactions with banks and insurers. Supervisory discussions with senior management of banks and insurers incorporate climate-related issues on an ad hoc basis. For example, when discussing credit risk the climate-related drivers of credit risk may be part of the discussion. It is clear that embedding climate-related risk issues needs significant work. Notwithstanding its efforts to promote sustainable finance, the FSA needs to pay appropriate attention to effective supervision of climate-related risks to maintain financial stability in line with its policy objectives.

49. Recommendation 2: The FSA should take action to develop supervisory tools and embed climate-related risk issues in supervisory practices in a systematic way.

50. Recommendation 3: The FSA should consider training needs of supervision staff in relation to climate-related risks and how to best structure internal resources to facilitate knowledge transfer related to climate issues.

C. Supervisory Approach, Tools, and Technique

51. The FSA's sets out its basic approach for supervision and inspection of financial institutions in the area of climate change as supervisory guidance. This has been published in July 2022 as *Supervisory Guidance on Climate-related Risk Management and Client Engagement*[23] (Climate Guidance). In *Replacing checklists with engagement* the FSA indicates that it aims to present underlying concepts, approaches and principles by issuing discussion papers which serve as reference in dialogue between the FSA and financial institutions. The FSA also uses its annual Strategic Directions and Priorities reports as measures to convey subjects of priority.

52. The FSA has comprehensive guidelines for the supervision of major banks and for the supervision of insurers which cover the concepts of financial supervision and regulation in general. The Comprehensive Guidelines for the Supervision of Major Banks[24] set out the key principles of financial supervision, points of note during administrative processes and supervisory evaluation points. They serve as a guide for FSA staff members in performing their duties of supervising major banks and the FSA's relevant bureaus and divisions are required to carry out processes of supervision in conformity with the guidelines. While being labelled for Major Banks, the guidelines state they are not only applicable to Major Banks but also to other similar entities including long-term credit banks, foreign bank branches, trust banks and entities newly entering into banking business (see I-3(3)). For the supervision of insurers, there are the Comprehensive

[23] https://www.fsa.go.jp/news/r4/ginkou/20220712/03.pdf.

[24] https://www.fsa.go.jp/common/law/guide/kantokushishin.pdf.

Guidelines for Supervision for Insurance Companies[25] which are intended as a manual for FSA employees who will take the role of inspection and supervision of insurance companies (I-3(1)).

53. The Climate Guidance is meant to be applied in the context of the two sets of Comprehesive Guidelines and frame supervisory discussions. The discussion paper format and the stated nature of the Climate Guidance indicates that it is intended to be non-binding. The discussion paper format communicates the position that the FSA is ready to hear comments from the banking and insurance sectors. Since beginning the reform of the supervisory and monitoring system in 2016, the FSA has used the process of issuing discussion papers to demonstrate the FSA's thinking to the banking and insurance sectors on particular topics.

54. The BOJ has discussions on climate-related issues through on-site examinations and conducts off-site monitoring. Discussions occur with board members and chairs of committees of financial institutions. Issues discussed include strategy, risk management and internal control. If practical issues are identified then discussions occur with working level staff. The BOJ will have in-depth discussions with financial institutions on their efforts in addressing climate-related financial risks as well as on their engagement with corporate customers in pursuit of decarbonization.

D. Supervisory Expectations on Management of Climate-Related Risks

55. The FSA expects the board of directors and management of banks and insurers understand the profit opportunities for both financial institutions and clients in building resilience against climate change, as well as the risks that climate change poses to their own and clients' businesses. There is emphasis on banks and insurers working with their clients in developing and investing in solutions to decarbonization. Managing risks is not just about conducting a passive risk assessment, it is about being involved in encouraging clients to decarbonize or minimize GHG emissions. This is in line with the desire of the Japanese government for financial institutions to continue supporting GHG intensive industries in the transition period to 2050 when net zero should be achieved across the Japanese economy. These expectations are set out in the Climate Guidance.

56. Financial institutions' overall management strategies must incorporate strategies to increase the resilience of their businesses against climate change and contribute to achieving GHG neutrality by supporting their clients' responses to climate change. This is supposed to be evidenced in an implemented business plan, which includes specific targets, evaluation indicators and achievement deadlines, based on the strategies for responding to climate change. Progress in implementing the strategies for responding to climate change must be tracked based on responsibilities various stakeholders including customers, shareholders, creditors, and relevant authorities, through disclosure and reporting (see Section on Disclosure and Data below).

[25] https://www.fsa.go.jp/common/law/guide/en_ins.pdf.

57. Financial institutions must be able to identify and assess opportunities and risks that climate change brings to clients and financial institutions own business management in a forward-looking manner. Financial institutions must develop their scenario analysis of climate-related risks to assist them in building their own strategies.

58. The FSA expects financial institutions to support clients' and investees' responses to climate change in order to manage financial institutions' climate-related risks. Financial institutions are expected to accumulate knowledge of climate change and the effect on clients through the evolution of technologies, industries and the natural environment. Financial institutions are to use this knowledge to support clients. This support could be direct and indirect. Direct support of clients includes providing consulting and solution delivery services and supplying financing to support steps towards decarbonization. The Climate Guidance also provides examples of indirect support. Examples of indirect support include providing area-wide support such as mapping out a strategy for a group of linked suppliers in a region or supporting community-wide initiatives toward decarbonization which may involve collaboration with local governments and research institutes.

59. With the emphasis on client engagement and assessing opportunities for business evolution of clients to assist in their decarbonization process, some of the approaches to managing risks are not elaborated. While it can be argued that risk management requirements are addressed in the comprehensive guidelines for major banks and insurers, these lack specificity for climate-related risks. The following paragraphs set out where enhancement of the current supervisory requirements and guidance could be considered.

60. There is no elaboration of how climate-related risks could be addressed in the three lines of defense in banks and insurers internal control frameworks. There is no identification of climate-related responsibilities and reporting lines. There is no discussion of assessing climate-related risks during client onboarding, credit assessment or underwriting processes. There is no elaboration of the role of the risk function in assessing climate-related risks. There is no discussion of the role of the internal audit function in providing an independent review of the assessment of climate-related risks.

61. There is a need to address identification and quantification of financial risks in internal capital and liquidity assessment processes. The Climate Guidance has a short section titled *Addressing financial institutions' risks* (Section III - 3(2)). This does not clearly link to internal capital and liquidity processes other than a footnote reference to non-life Internationally Active Insurance Groups' (IAIGs) Own Risk and Solvency Assessment (ORSA).

62. The Climate Guidance does not cover how banks and insurers should address climate-related risks in their risk appetite and risk management frameworks. While it is arguable that this is addressed through requirements in the sector specific supervisory guidelines because climate-related risks are risk drivers of traditional financial risks, there are specificities to consider such as climate-related risk concentrations at the geographic or industry sector level. Risk mitigation measures based on limiting exposures to certain climate-related risk drivers may be appropriate.

63. The Climate Guidance only minimally addresses expectations of risk data aggregation and internal risk reporting practices in Section III-1. Acquisition of appropriate data and identification of data gaps will be key to assessing, identifying, and measuring climate-related risks as methodologies evolve. Therefore, it is notable that acquisition of necessary data is identified as an issue but with no expansion. While the importance of governance related to climate change impacts is emphasized in the Climate Guidance, it minimally addresses internal risk reporting practices by identifying that as an issue to be considered.

64. The Climate Guidance contains no elaboration of expectations regarding credit policies and processes to address material climate-related credit risks. It would be helpful for the Climate Guidance to elaborate how banks and insurers should identify, measure, evaluate, monitor, report, and control or mitigate material climate-related risk drivers of credit exposures. Concentrations of exposures are important to address as climate-related risk drivers are likely to create new forms of correlated credit risk exposures based on geographies and industry sectors.

65. In addition, the Climate Guidance contains no articulation of expectations regarding assessment and management of climate-related market risks. Life insurers will have significant market risk due to transition and physical risk in their investment portfolios. Similarly, banks need to understand the impact of climate-risk drivers in the portfolios of financial instruments. The pricing and availability of hedges should also be considered by banks and insurers in the context of different climate and transition pathways, particularly disorderly transition.

66. The impact of climate-related drivers on liquidity risk profiles is not addressed in the Climate Guidance. There may be impacts on non-life insurers' liquidity risk due to the increasing incidence and severity of natural catastrophes. Banks may find drawdowns on lines of credit or accelerated deposit withdrawals in such situations as well. The value of assets that are used as sources of liquidity may also be impacted over time.

67. Operational risk could be materially affected by climate-related risk drivers, but this is not addressed specifically in the Climate Guidance. Banks and insurers may face greater impacts from disruptions to their services due to the increasing incidence and severity of natural catastrophes. More articulation of expectations on impact on operational risk would be helpful.

68. In the Climate Guidance, there is a need for more articulation of expectations on incorporating climate-related issues in underwriting practices of non-life insurers. Physical risks, transition risks and liability risks could all impact outcomes from underwriting decisions. When these risks are material there should be an expectation that insurers assess the implications for their underwriting strategy.

69. As detailed in the section below on Practice by Financial Institutions, major financial institutions are addressing many of the issues raised in paragraphs 59. 67 in their activities even though these issues are not covered in the Climate Guidance. This observation only relates to the largest banks, life insurers and non-life insurers. While it is important that the actual practice of Japanese financial institutions advances voluntarily, it is also important that the FSA sets out its

expectations clearly and in a way that is ultimately enforceable, if necessary. Such expectations should be sufficiently flexible to encompass the various unique features and circumstances of regulated financial institutions across the spectrum of size and complexity.

70. Recommendation 4: The FSA should review supervisory requirements and guidance on climate-related risk management and client engagement in consideration of international principles and guidance.

E. Practice by Financial Institutions

71. This section is based on observations from TCFD disclosure of the three major banks, three major life insurers and three major non-life insurers. The section considers the development and disclosure of climate targets and transition plans and how financial institutions are incorporating climate-related risks into the risk management, capital management and liquidity risk monitoring processes. This is not meant to be a comprehensive assessment, but a recognition of progress made.

Banks

72. All three major banks have made commitments to carbon neutrality with specific interim targets. All three banks have made commitments to carbon neutrality by 2050 with separate declarations for GHG emissions from their own operations along with progress towards that target (Table 3). All three banks have reported their progress in reducing financed emissions from high emission sectors. Two of the three major banks have developed and disclosed transition plans at the time of writing this Technical Note.

73. All three major banks have set out their approach to governance climate-related risks and opportunities. Governance structures are in place both in terms of specific committees (e.g., a sustainability committee) and the role of other committees charged with reviewing specific risks such as credit risk. All three major banks have created a full-time Chief Sustainability Officer role within the governance structure.

74. Banks acknowledge a possible impact on liquidity risk from climate-related drivers based on their disclosures. However, they consider climate-related drivers of liquidity risk to be of low materiality. This assessment is not explained or quantified.

75. All three banks have outlined an approach to incorporating climate-related drivers in their overall approach to management of traditional financial risks. It is clear that the major banks are still evolving their considerations of climate-related drivers in their management of these traditional financial risks. The impact of climate-related risks on capital management is based on high-level theoretical descriptions of the general risk management systems without providing clear statements of the practical impact. There are no practical examples to help understand the impact of climate-related risks on capital management.

Insurers

76. The three major life insurers shown in Table 4 have announced commitments to carbon neutrality by 2050. These commitments include interim targets. However only one of the three major life insurers has set out a detailed transition plan.

77. The three major insurers shown in Table 4 have set out their approach to governance of climate-related risks and opportunities. However, it is notable that their governance disclosures are not as extensive as those for the banks. Despite that, it is clear that specific committees have been established and climate-related risks are issues for risk management committees to consider. Two of the three major life insurers have appointed Chief Sustainability Officers.

78. Risk management disclosures indicate that climate change is seen as a key risk by the three major life insurers. However, risk management disclosures are quite summarized and high level. It is therefore not possible to understand how life insurers view climate-related risks in relation to capital and risk management.

79. All three major non-life insurers (see Table 5) have committed to net zero GHG emissions by 2050. However, they have not formulated and disclosed transition plans for achieving this commitment.

80. The major non-life insurers have set out governance related to climate opportunities and risks. They have appointed Chief Sustainability Officers and have set up sustainability committees as well as setting out roles for risk management committees and ultimate oversight of the board of directors.

81. The major non-life insurers provided a high-level overview of how climate-related risks are included in their risk management frameworks. However, it is not clear what the links are to capital and liquidity management. The major non-life insurers have all identified litigation risk in their underwriting portfolios as potential sources of material risk.

DISCLOSURE

82. Companies listed on the Tokyo Stock Exchange Prime Market[26] (which includes banks and insurers) must make disclosures based on or equivalent to TCFD requirements. The Tokyo Stock Exchange's Corporate Governance Code was updated in June 2021 to include the stipulation on TCFD disclosures. As of February 9, 2024, there were 1655 companies listed on the Prime Market. Mutual insurers are also voluntarily making TCFD disclosures so the major banks, major non-life insurers and major life insurers are all making TCFD disclosures. According to the TCFD's October 2023 status report's analysis of implementation by region, Japan has the fourth highest absolute

[26] Tokyo Stock Exchange defines the Prime Market as the market oriented to companies which center their business on constructive dialogue with global investors. Criteria include market capitalization of at least JPY 25 billion on initial listing.

number of companies disclosing TCFD reports.[27] Also, according to the TCFD's October 2023 status report, the Asia Pacific region has the highest percentage of TCFD supporters in the world largely driven by supporters in Japan.

83. TCFD reports issued by major banks and insurers are reviewed and there are discussions in relation to the development of scenario analysis. The supervisory review of TCFD reports could be more systematic. It would be useful for the FSA to conduct an analysis across each sector and also a comparison among sectors. See below for more details to assist with the implementation of IFRS S1 and IFRS S2.

84. A review of the TCFD reports of the three major banks, three major life insurers and three major non-life insurers reveals that disclosures vary in depth across sectors and even within sectors. The three major banks generally have more depth to their TCFD disclosures than the insurers. Non-life insurers appear to have the least detail in their TCFD disclosures.

85. TCFD disclosures reveal significant variability in approaches, scenarios and methodologies used to quantify climate risks. This is somewhat understandable given the methodologies for quantifying climate risk are in early stages of development. Table 2 provides a high-level summary of scenario analysis presented in TCFD disclosures by the three major banks. Table 3 provides TCFD disclosures by three major life insurers. Table 4 provides TCFD disclosures by the three major non-life insurers. It is notable that only one bank is considering chronic physical risk with the other financial institutions represented in these three tables only considering acute physical risk. It is also notable that mutual insurers are implementing TCFD on a voluntary basis. The FSA should conduct a thematic cross-sector review of TCFD disclosures with a focus on scenario analysis and publication of a report with recommendations for improvement and greater consistency.

[27] https://www.fsb.org/wp-content/uploads/P121023-2.pdf.

Table 3. Japan: Scenario Analysis of Major Bank Groups from 2023 TCFD Disclosures

Risk Type	Banking Group 1	Banking Group 2	Banking Group 3
Acute physical risk scenario	Flood: IPCC RPC 2.6 (2°C) and RPC 8.5 (4°C) Until 2100 using March 2022 as the basis	Flood: IPCC RPC 2.6 + SSP1-2.6 (2°C) and RPC 8.5 + SSP5-8.5 (4°C) Up to 2050	NGFS Current Policies and Net Zero 2050
Acute physical risk result	Cumulative total: JPY 115.5 billion	Cumulative total: JPY 67-85 billion	Maximum increase if a stress event occurs: Cyclones and floods 90 billion; Wildfires JPY 30 billion; Droughts JPY 1.5 billion
Chronic physical risk scenario	N/A	N/A	Temperature – labor force reduction and increase a/c usage: JPY 40 billion
Transition risk scenario	Various scenarios including IEA sustainable development and 1.5°C NGFS Until 2050 using March 2022 as the basis	NGFS 1.5°C IEA 1.5°C and NGFS 3°C Up to 2050	NGFS Current Policies Below 2°C Delayed Transition Net Zero 2050 (1.5°C)
Transition risk results	Single-year basis JPY 1.5 billion to JPY 28.5 billion	Single year: JPY 2.5 billion to JPY 28 billion	Cumulative increase in credit costs to 2050: Below 2°C: JPY 360 billion Delayed Transition: JPY 1.17 trillion Net Zero 2050: JPY 1.65 trillion

Source: IMF staff analysis of TCFD disclosures of three major banks.

Table 4. Japan: Scenario Analysis of Major Life Insurance Groups from 2023 TCFD Disclosures					
Risk Type	**Life Insurance Group 1**	**Life Insurance Group 2**	**Life Insurance Group 3**		
Publication	2023	2023	2023		
Acute physical risk scenario	Flood and Mortality: IPCC RPC 2.6 (2°C) and RPC 8.5 (4°C) Up to 2100	Mortality/Morbidity IPCC SSP5-8.5 (4°C) Up to 2090s	Mortality/Morbidity: IPCC RPC 2.6 (2°C) and RPC 8.5 (4°C) Up to 2100		
Acute physical risk result	RPC 2.6 (2°C) – impact on mortality rate 3.5 billion, own property JPY 35 million, asset management 8.1 billion RPC 8.5 (4°C) impact on mortality rate 7 billion, own property JPY 110 million, asset management JPY 10.9 billion	Death benefits: JPY 4.5 billion Hospitalization: JPY 100-200 million		RPC 2.6 (2°C)	RPC 8.5 (4°C)
			Death Benefits (10-year average 450 billion)	JPY 1 billion	JPY 5 billion
			Hospitalization (10-year average 36 billion)	JPY 20 million	JPY 70 million
Transition risk scenario	NGFS Net zero 205 0(1.5°C), Delayed Transition (2°C) and Current Policies (4°C) MSCI CVAR	1.5°C Orderly, 3°C Orderly, 1.5°C Disorderly MSCI CVAR	1.5°C Scenario, 2°C Scenario, 3°C Scenario (not sure if NGFS) MSCI CVAR		
Transition risk results	CVAR risks only 1.5°C scenario: JPY -7.8 billion, 2°C scenario JPY -16.7 billion, 4°C scenario JPY -0.2 billion Tech opportunities estimate to outweigh risks	Policy risk opportunities and physical risk netted - CVAR 1.5°C Orderly 19.5% 1.5°C Disorderly – 21.8% 3°C Orderly – 21.2%	No figures given but indication that technological opportunities do not outweigh physical and transition risks		

Source: IMF staff analysis of TCFD disclosures of three life insurance groups.

Table 5. Japan: Scenario Analysis of Major Non-Life Insurance Groups from 2023 TCFD Disclosures

Risk Type	Non-Life Insurance Group 1	Non-Life Insurance Group 2	Non-Life Insurance Group 3	
Acute physical risk scenario	Typhoon: IPCC RPC 8.5 (4°C) Until 2050 Storm surge from Typhoons: RPC 8.5 and RCP 4.5 (2°C)	Typhoon: IPCC RPC 8.5 (4°C) Up to 2050 – frequency and damage	Typhoon: IPCC RPC 8.5 (4°C) Up to 2050 – intensity and frequency	
Acute physical risk result	Losses from typhoons – Intensity +5% to +50% and Frequency -30% to +28%. No yen value provided	Frequency change: -30% to +30%. Amount of damage: +10% to +50% No yen value provided	Japan -Intensity (windspeed) +5% to +53%, frequency -30% to +28% US – Intensity 0% to 37%, frequency -36% to +30%	
Transition risk scenario	Trucost - carbon earnings at risk High Scenario – temperature increases of less than 2°C warming by 2100; Medium Scenario – less than 2°C warming by 2100 but delayed action, Low Scenario – around 3°C warming by 2100	All NGFS scenarios up to 2050 Using MSCI CVAR	NGFS Orderly and Disorderly up to 2050 using Aladdin Climate by BlackRock Solutions	
Transition risk results	High Scenario results Stocks: 18.2% EBIT at risk in 2030, 27.6% in 2040 and 31.4% in 2050 Corporate bonds: 29.7% EBIT at risk in 2030, 43.8% in 2040 and 49.4% in 2050	Domestic equity -0.66% to -54.76% Foreign equity: -0.11% to -3.02% Domestic Bond: -0.04% to -19.62%, Foreign bond -0.01% to -3.67%	Orderly Equities -7.7% Corp Bonds -2.4% CMBS 0% Gov Bonds 0% Total -1.5%	Disorderly Equities -5.6% Corp Bonds -1.8% CMBS -0.2% Gov Bonds -0.4% Total -1.3%

Source: IMF staff analysis of TCFD disclosures of three non-life insurance groups.

86. There are lessons that can be learned from a review of different practices within sectors and across sectors. For example, the non-life insurance sector describes quantitative impacts but does not yet attach yen value to those impacts. The life insurance sector is using the CVAR to attempt to quantify both the opportunities and risks from transition whereas in the banking sector scenario analysis appears to be focused on risks only. These differences in approach provide ample opportunity for Japanese banks and insurers to learn from each other and further develop approaches to quantifying climate risk that may converge over time. The FSA could play a significant role in accelerating the learning approach by conducting analysis of not only scenario analysis methodologies but also other aspects of TCFD disclosures by banks and insurers across all four TCFD pillars. Note that this recommendation is made in relation to the FSA's role as the supervisor of the banking and insurance sectors because that is the focus of this technical note. However, as noted below the FSA is also undertaking activities in relation to its Securities supervision as well. This Technical Note acknowledges these developments but has not analyzed the FSA's role from this perspective.

87. The MOE is providing practical guidance for scenario analysis in line with TCFD recommendations. The first version of a practical guide for scenario analysis for banks was released in March 2019 with an update in March 2022.[28] The guide sets out the sequence from risk identification to quantitative assessment to assist with the identification of the financial impact of transition risks and physical risk in different borrower sectors. It provides case examples obtained through a pilot program in cooperation with three regional banks.

88. Since the fiscal year ended March 31, 2023, all listed companies have been required to submit securities reports including a description of their views and initiatives on sustainability. The change was made in the Cabinet Office Ordinance on Disclosure of Corporate Affairs. This means that more than 4000 companies are now required to make climate disclosures including many smaller insurers and banks. While companies are not required to fully comply with the detail of TCFD requirements, they must address the four pillars of TCFD disclosures: Governance, Strategy, Risk Management and Metrics and Targets. Listed companies are expected to actively disclose Scope 1 and Scope 2 GHG emissions.

89. Sustainability disclosure standards are currently being developed by the SSBJ which will likely be aligned with the ISSB Standards S1 and S2. The SSBJ is an independent standard setter. It sits within the organizational structure of the Financial Accounting Standards Foundation. The SSBJ has made public commitments to developing Japanese sustainability disclosure standards that build on the global baseline of sustainability-related disclosures established by the ISSB Standards. The SSBJ intends to work closely with the ISSB as Japanese sustainability disclosure standards are developed. The SSBJ has committed to issuing exposure drafts of its standards by no later than March 31, 2024, and issuing final standards by no later than March 31, 2025. The mandatory effective date of the standards is yet to be determined.

[28] https://www.env.go.jp/press/110877.html.

90. In essence, the development of climate disclosures in Japan have been developed in three stages. The first stage was the TCFD disclosures for the Tokyo Stock Exchange Prime Listed companies, then the second stage is the securities reports addressing the four pillars of TCFD disclosures for all listed companies and the third stage will be implementation of SSBJ standards. The FSA is liaising with the SSBJ about the development of these disclosure standards.

91. Recommendation 5: The FSA should conduct a thematic cross-sector review of TCFD disclosures with a focus on scenario analysis and publish a report with recommendations for improvement and greater consistency to assist with the implementation of IFRS S1 and IFRS S2.