Climate Change (Disclosures Based on TCFD Recommendations) - Strategy -

Core Principles Toward Solving Environmental Issues

Toward Fulfilling Our Purpose: Sustaining All Life. ~Together with our stakeholders we nurture the agriculture, fishery, and forestry industries, creating a future abundant in food and life, while contributing to a sustainable global environment~
In addition, we formulated an Environmental Policy (Core Principles Toward Solving Environmental Issues) pursuant to a decision of our Board of Directors. Under this policy, we commit to solve issues related to the global environment through our business activities and reduce the environmental burden of our business activities.

Commitment to Net Zero by 2050

In March 2023, the Bank announced *Commitment to Net Zero by 2050* as our response to escalating climate change.

Commitment to Net Zero by 2050
The Norinchukin Bank, together with our stakeholders, aims to achieve a Net Zero society by the year 2050.

Transition Plan Toward Net Zero

As part of this commitment, the Bank joined the Net-Zero Banking Alliance (NZBA)*, an international initiative among banks that aims to achieve net zero greenhouse gas emissions through investment and finance portfolios by the year 2050. In addition, we created the Transition Plan Toward Net Zero in conjunction with this commitment. This plan describes forth specific initiatives, including an interim target for fiscal 2030 formulated in line with the 1.5°C scenario under the Paris Agreement.

* Net-Zero Banking Alliance (NZBA): An international banking initiative committed to a net-zero portfolio of investments and finance clients by the year 2050. The alliance consists of 125 member banks worldwide as of February 2023. The NZBA identified nine carbon-intensive sectors (power generation, oil and gas, steel, coal, agriculture, real estate, transportation, cement, and aluminum), and requires that reduction targets be set for at least one of these sectors within 18 months of joining, with targets set for the remaining sectors within 36 months.

The Norinchukin Bank's Purpose

Dedicated to sustaining all life.

Work together with our stakeholders to foster the agriculture, forestry and fisheries (AFF) industries and to create a prosperous future for food and lifestyles, and thereby contribute to a sustainable global environment.

A commitment to achieving Net Zero by 2050

The Norinchukin Bank will be working together with its stakeholders to achieve Net Zero greenhouse gas (GHG) emissions by 2050.

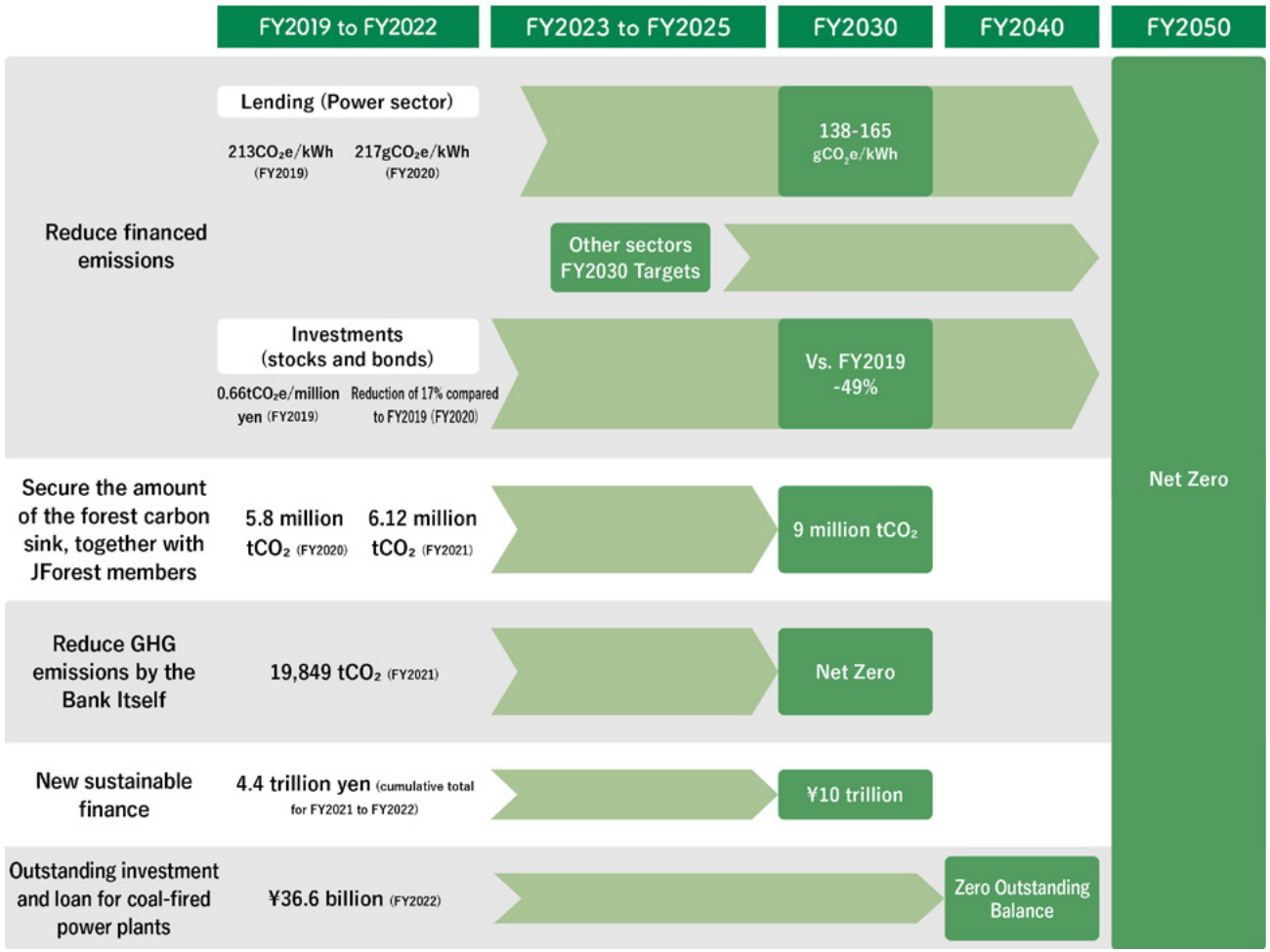
Transition Plan for Achieving Net Zero Emissions by 2050

Reducing GHG emissions	● **Reduce financed emissions** Interim target for FY2030 toward Net Zero by 2050(vs. FY 2019) **Lending:** Power sector 138～165gCO_2 e/kWh(Other sectors TBC) **Investment :** 49% reduction based on economic intensity ● **Increase the forest carbon sink, together with JForest members** 9 million tons per year as of FY 2030 ● **Reduce GHG emissions by the Bank itself** Net Zero by FY2030
Promote sustainable business	● **Execute new sustainable financing** – 10 trillion yen by FY2030 ● **Develop and provide decarbonization solution functions for customers**
Strengthen the Bank's risk management stance	● **Enhance the Bank's risk management stance, strengthen scenario analysis and make effective use of this analysis in risk control** ● **Reduce financing for coal-fired electric power generation to zero by FY2040**
Strengthen the Bank's sustainability promotion stance	● **Strengthen the Bank's stance in relation to realizing Net Zero emissions, and strengthen participation in related initiatives and coordination with stakeholders**

Dialog with stakeholders

Code of Ethics, Environmental Policy and Basic Policy for Investment and Loans

Roadmap Toward Net Zero 2050



Reducing Financed Emissions

We aim to achieve net-zero greenhouse gas emissions in our investment and loan portfolio by fiscal 2050. To achieve this goal, we set an interim target for the electricity sector among our borrowers to reduce GHG emissions intensity per unit of electricity generated in fiscal 2030, in accordance with the NZBA framework. We will continue to set emissions reduction targets in stages for carbon-intensive sectors as defined in the framework. We have also set interim targets for emission reductions through our investment portfolio (stocks and bonds) through fiscal 2030 by considering the importance of the proportion of investment assets in the Bank's investment and loan portfolio. In setting these targets, we referenced the Net Zero Initiative Framework for institutional investors.

FY2030 Interim Target (vs.FY2019)

Lending:

Setting interim emissions reduction targets for FY2030 for each carbon-intensive sector

Power Sector: 138-165 gCO_2e/kWh

Investment:

Setting emissions reduction targets for the Bank's investment portfolio

49% reduction on a per unit of investment basis%

Profile of the Net Zero Banking Alliance (NZBA)

Date of establishment:	● April 2021
Secretariat:	● United Nations Environment Programme - Finance Initiative (UNEP FI)
Overview:	● The Net Zero Banking Alliance (NZBA) is a banking initiative led by the UNEP FI which aims to use banks' investment and lending portfolios to help realize Net Zero GHG emissions by 2050. ● With the aim of realizing Net Zero by 2050, banks that join the NZBA are expected to set interim targets for 2030 at the latest in relation to 9 sectors with particularly high emissions, and to continue implementing periodic disclosure after that date.

Timeline after joining the NZBA

Within 18 months of joining the NZBA, a bank is expected to set targets for one sector out of nine carbon-intensive sectors (agriculture, aluminum, cement, coal, commercial and residential real estate, iron and steel, oil and gas, power generation, and transport), and the bank must then set targets for the remaining sectors within 36 months of joining; in this way, the bank can implement a step-by-step response while setting a priority order in line with the relative importance of particular sectors within its portfolio.

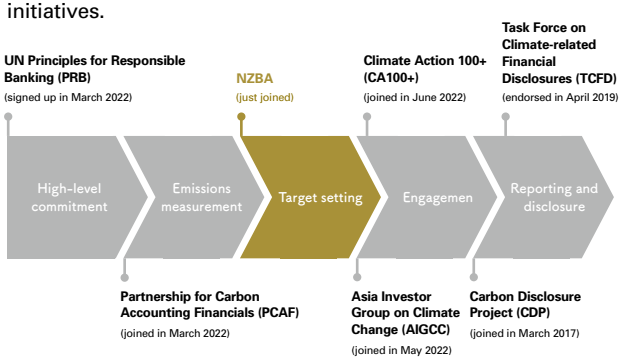
March 2023: **Joined the NZBA (and set targets for lending to the power generation sector)**

September 2024: **Deadline for setting targets for one carbon-intensive sector** (18 months after joining)

March 2026: **Deadline for setting targets for the remaining sectors** (36 months after joining)

Relationship with other initiatives that The Norinchukin Bank participates in

The Bank has already joined several initiatives relating to GHG emissions, based on its assessment of their objectives. By joining the NZBA, where the main focus is on setting concrete targets, the Bank is aiming to help further these other initiatives.



Secure the amount of the forest carbon sink, together with JForest members

We set a target for the amount of the forest carbon sink of 9 million tCO_2/year by fiscal 2030, based on a forecast of projected areas of operations* in line with targets set by forestry cooperatives nationwide, Forests play an important role in absorbing CO_2 and conserving biodiversity while facing numerous challenges. These challenges include low prices for standing timber, costs associated with reforestation, and finding workers who are willing to lead in the forestry sector. To ensure CO_2 absorption, the Bank endeavors to resolve upstream, midstream, and downstream issues related to forests and forestry to support sustainable forest operations across forestry cooperatives.

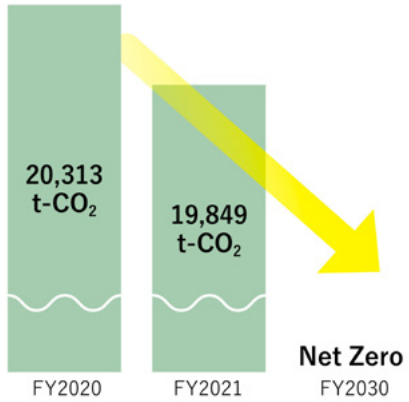
* New planting (reforestation), undercutting, clearing, thinning, and main cutting

→ Initiatives to Fulfill the Multifunctional Roles of Forests P.71

PNorinchukin Bank Facility GHG Emissions (Scope 1 and Scope 2)

We aim to achieve net-zero greenhouse gas emissions from banking facilities by fiscal 2030. In fiscal 2021, actual emissions amounted to 19,849 tCO_2. We will continue to switch to renewable energy sources for the electricity we use, mainly at properties contracted by the Bank.

Reduce GHG emissions by the Bank Itself



Pursuing Sustainable Business -Opportunities Related to Climate Change-

Climate change is a future risk. At the same time, we can find business opportunities in mitigating and adapting to this risk. One example is the potential for shifting electricity to renewable energy. The shift from conventional thermal power to offshore wind and solar power generation will lead to corporate capital investment and lending and investment opportunities for the Bank.

Stakeholder Engagement Initiatives

To solve environmental and social issues, including climate change, we must emphasize engagement with stakeholders and take action together through dialogue and deep mutual understanding. The Bank strives to engage more closely with investees and borrowers to identify business opportunities and manage risks, aiming to achieve net zero by the year 2050. In fiscal 2022, we conducted more than 100 engagements such as supporting measurement and reduction of GHG emissions, proposing sustainable finance, etc with high-emissions entities and companies in the agriculture, fishery, and forestry industries. We also conduct engagement with investees according to asset class.

Engagement based on Client Relationships

We engage in dialogue with borrowers about their current conditions, issues, and response, by reflecting an understanding of their awareness related to the risks associated with climate change. Based on these dialogues, we develop solutions according to their needs.

Engagement Content (Overview)

- Understand the current conditions and issues faced by business partners
- Confirm the status of sustainability initiatives, including any climate change targets
- Confirm impacts on management (business and financial) and issues based on as stated above
- Propose solutions

Based on an understanding as stated above, we continue deeper engagement, working with clients in agriculture, fishery, and forestry industries to measuring their GHG emissions and support them in setting reduction targets. We also engage in dialogue with clients in the electricity sector.

→ Initiatives to Reduce Environmental burden Through Agriculture P.70

Topics

Electricity Sector Client Engagement

The Bank focuses on engagement with clients in the electricity sector to achieve our fiscal 2030 sector targets. We engage in careful dialogue related to strategies and initiatives for stable energy supply, the decarbonization of electricity sources, and other topics.

Engagement as a Global Institutional Investor ~ Collaborative Engagement Through Climate Action 100+ (CA100+) ~

The Bank and Group company Norinchukin Zenkyoren Asset Management Co., Ltd. are members of Climate Action 100+ (CA100+), an international investor-led initiative that seeks corporate climate change action through collaborative engagement with institutional investors worldwide. Working with other institutional investors to engage in constructive dialogue on climate change, we encourage behavioral change toward decarbonization among target companies. We also accumulate knowledge through collaborative engagement and improve the effectiveness of individual engagement as we strive to create decarbonized societies.

Topics

Multifaced Engagement With Major Energy Sector Clients

The Bank offers a wide range of functions across our group to address ESG integration, renewable energy compliance, and other diverse sustainability issues to a major energy sector client who has set a goal for carbon neutrality by the year 2050. In the meantime, Norinchukin Bank director and managing executive officer, Mr. YUDA Hiroshi, attended the Sustainability Committee, where senior managements of this company also participated, to engage in dialogue with its senior managements regarding 'the current status and issues of ESG investment' from the perspective of an institutional investor.

YUDA Hiroshi, Director and Managing Executive Officer, Norinchukin Bank

Topics

Presentation of Opinion at the FinCity Global Forum ~ Transition Finance and the Challenges Faced by Tokyo ~

The Organization of Global Financial City Tokyo ("FinCity.Tokyo") sponsored an international symposium entitled, *FinCity Global Forum ~ Transition Finance and the Challenges Faced by Tokyo ~*, in February 2023. Managing Executive Officer IMAI Masato of the Norinchukin Bank in a panel discussion. Mr. Imai conveyed the Bank's sustainable finance initiatives and our message for the advancement of transition finance in Japan in a powerful manner.

IMAI Masato, Managing Executive Officer, Norinchukin Bank
© 2023 The Organization of Global Financial City Tokyo

Climate Change Initiatives at JA Bank

The Bank provide information and engage in dialogue with JA Shinnoren about disclosure based on climate change response and TCFD recommendations. As JA Bank, we strives to resolve climate change and other environmental issues.

Sustainability Linked Loans in Cooperation With JA Bank Members

The Norinchukin Trust & Banking Co.,Ltd. serves as an arranger, constructing syndicated sustainability linked loans between JA Bank members (JA Shinnoren) and Norinchukin Bank, working with JA Bank to support the climate change response of clients.

Efforts to Promote the Use of Electric Vehicles

To provide financial support in encouraging the spread of electric vehicles (EVs), which have a low environmental impact, and from the perspective of contributing to decarbonized societies, JA Bank, in cooperation with Agriculture, Forestry and Fisheries Credit Foundations and Kyodo Housing Loan Co., Ltd., has begun to include funds for the purchase of new EV vehicles that meet certain requirements into mortgage loans.

Sustainable Finance Initiatives

The Bank established a target of 10 trillion yen in new sustainable financing by fiscal 2030 as a medium- to long-term goal for sustainable environments and societies. Between fiscal 2021 and fiscal 2022, the Bank has conducted approximately 4.4 trillion yen in sustainable financing.

→ Sustainable Finance Details P.19

We approach sustainable finance through the dual aspects of securing business opportunities and engaging in risk management. In addition to credit decisions based on traditional finance risk, Norinchukin Bank has also adopted the ESG Integration framework. We use this framework not only for internal controls, but also as a tool to engage in dialogue with our business partners.

Secure Business Opportunities

Sustainable Finance

We conduct investment and financing activities to generate profit and to contribute to the development of a sustainable environment and society and to the growth of the AFF industries.

FY2021-2022 Newly executed amount (cumulative)
Approx. 4.4 trillion yen

Medium- to long-term target for 2030
Newly executed amount: **10 trillion yen**

Our sustainable finance refers to the following:

■ **Investment and finance**
sustainability linked loans, green loans, social loans, sustainability loans, transition loans Investment and lending to companies with ESG-related certification, and authorized investment and lending Other investment and lending for the resolution of environmental and social issues

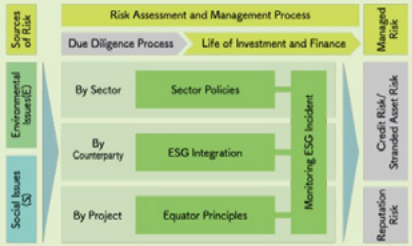
■ **Funding**
Sustainability-related funding

Risk Management

Environmental and Social Risk Management (ESRM)

We have built an ESRM framework to assess and manage environmental risks and social risks prior to making investment and financing decisions for individual customers and projects.

■ The ESRM Framework



ESG Integration

We are striving to build a decision-making process for investment and finance decisions that integrates a recognition of environmental and social risk into credit decisions based on the traditional financial risk evaluation process. This framework is a tool not only for internal controls but also for engaging in dialogue with customers based on non-financial information.

Impact Analysis of Climate Change-Related Risk

The risks of climate change can be divided into transition risks and physical risks.

Transition risk refers to the risk that occurs in transitioning to a society with low greenhouse gas emissions (a low-carbon society). For example, the introduction of a carbon tax levied on greenhouse gas emissions could lead to a negative financial impact on investees and borrowers that have high emissions. This in turn could result in credit costs for financial institutions.

Physical risks are risks of intensification or increase in extreme weather events due to climate change or from long-term changes in climate patterns. Physical risks can be classified further into acute risks, such as increased flooding or other extreme weather events, and chronic risks, such as the agricultural impact of prolonged high temperatures. We have conducted a scenario analysis of these risks, providing disclosure of our results.

Climate Change Risks Recognized by the Bank

Risk	Classification	Major Risks	Time Frame
Transition Risk	Government Policy, Legal, Technology,	● Increase in credit costs due to the impact of regulatory measures aimed at achieving the 2°C target on the business models and performance of investees and borrowers ● Increased in credit costs due to changes in the supply-demand relationship for goods and services and corporate performance as markets become more focused on decarbonization	Medium- to long-term
	Policy	● Changes in regulations in response to growing international concern regarding climate change	Short-term
	Reputation	● Risk of inadequate climate change efforts and information disclosure from the perspective of external parties	Short-term
Physical Risk	Acute	● Downturn resulting from stagnating investees' and borrowers' businesses due to natural disasters such as typhoons and torrential rains, as well as increasing credit costs resulting from damage to collateral value of real estate and other assets	Short-, Medium-, and Long-Term
	Chronic	● Risk that climate change will affect land use, productivity of primary industries, etc. ● Impact on business continuity due to damage to the Bank's assets caused by extreme weather	

Climate Change-Related Risk Assessment by Sector

The impact of climate change will become even more apparent over the medium- to long-term, and will vary depending on the sector in which our investees and borrowers operate. Therefore, we evaluated where and when transition and physical risks would occur in the targeting sectors and other areas defined by the TCFD recommendations.

The occurrence of risks associated with climate change is caused by various external factors, environments, and spillover channels. We created the table below after identifying these risks and factors. The table shows (in chronological order) the impact of these risks on the sectors in which the Bank has most financial exposure. Our analysis also reflects the effects of climate change occurring at different times according to region, geographic conditions, and legal regulations. As one example, transition risks in the EU are expected to occur early due to environmental regulations being adopted ahead of the rest of the world.

Low — Risk — High

*1 Transition risks are assessed based on a 2°C scenario in which policy measures mitigate climate change, while physical risks are assessed based on a 4°C scenario in which global warming advances.

Transition Risk Assessment*1

Sector	2030			2040			2050		
	Japan	EU	US	Japan	EU	US	Japan	EU	US
Electric utilities									
Oil-gas-coal									
Chemical									
Metal and mining									
Food and agriculture									
Beverages									
Railroad									
Land transport									
Marine transport									

Physical Risk Assessment *1

Sector	2030			2040			2050		
	Japan	EU	US	Japan	EU	US	Japan	EU	US
Chemical									
Real estate management and development									
Real estate–related finance									
Insurance									
Paper and forest products									
Food and agriculture									
Beverages									
Metal and mining									
Electricity									
Oil-gas-coal									
Railroad									

Impact Analysis of Climate Change-Related Risk (Scenario Analysis)

We conduct scenario analyses to understand the impact of climate-related risks on our credit portfolio and finances.

Transition Risk Analysis

Based on risk assessments shown to the left, we selected Electricity and Oil, Gas, and Coal as target sectors having high transition risk, and Food and Agriculture and Beverages as target sectors under transition risk that build value chains in the food and agriculture industries. In fiscal 2020, we conducted scenario analysis for these sectors, evaluating medium- and long-term changes in credit costs caused by the progress of decarbonization. Further, in fiscal 2022, we upgraded our analyses of these sectors and expanded the scope of analysis to the chemicals sector.

Scenarios analyzed include the Net Zero 2050 scenario published by the Central Banks and Supervisors Network for Greening the Financial System (NGFS), as well as scenarios published by representative organizations International Energy Agency (IEA) and the Food and Agriculture Organization of the United Nations (FAO).

Our analysis was based on the method published by the pilot project led by the United Nations Environment Program Finance Initiative (UNEP FI) with the objective of discussing and developing methods for climate-related financial information disclosure in the banking industry.

Physical Risk Analysis

In fiscal 2021, we began physical risk scenario analysis of acute and chronic physical risks in Japan, which we determined to be a high-risk region based on sector risk assessments associated with climate change.

In terms of acute risks, we analyzed flood damage, which has caused significant issues in recent years. In addition to the impact on key borrowers' locations in Japan, we analyzed the impact on real estate collateral pledged to the Bank.

In terms of chronic risks, conducted an analysis of the impact on the agricultural sector, an important sector to the Bank as our basis is in the agriculture, fishery and forestry industries. We selected rice cultivation and livestock production (milk and beef cattle) for analysis, looking at the impact of climate change, including rising temperatures, on producer income and assessing adaptation measures.

Transition Risk Scenario Analysis Overview

Step 1

We selected sectors and clients for analysis based on the climate-related risk assessment results and the Bank's investment and financing portfolio. We then prepared individual company data and external scenario data (see right).

- Base year data for individual companies
- External scenario data

Step 2

Based on the data from Step 1, we conducted an analysis using the quantitative transition risk model.*1

*1 Model based on UNEP-FI's Pilot Project on TCFD scenario analysis in banks

- Quantitative transition risk model analysis

Step 3

In this step, we conducted an analysis of the medium- to long-term financial condition of each target company. Our calculations reflected the level of net sales, expenses, investments, etc.*2

*2 The term of the analysis differs depends on the target sector. We analyzed energy-related sectors through 2042, which is in line with the period for which selected scenario data are provided. We analyzed other sectors through 2050.

- Forecast of the financial condition of each company, reflecting scenarios

Methodology for Transition Risk Scenario Analysis

■ Targets and sectors analyzed

Based on the results of our qualitative assessment of climate change-related risks, we selected the electricity, oil-gas-coal, food and agriculture, and beverage sectors as targets for transition risk scenario analysis. The electricity and oil-gas-coal sectors have been identified in the final TCFD report and SASB as sectors having high carbon emissions and highly vulnerable to transition risks. Our selection was based on initiatives consistent with these global views. We selected the food and agriculture and beverages sectors based on the results of our climate change qualitative assessment, as well as the fact that these two sectors form the foundation of the Bank. Given our investment and loan portfolio, the analysis covers not only domestic and overseas borrowers, but also our investees in corporate bonds.

■ Analysis scenario data

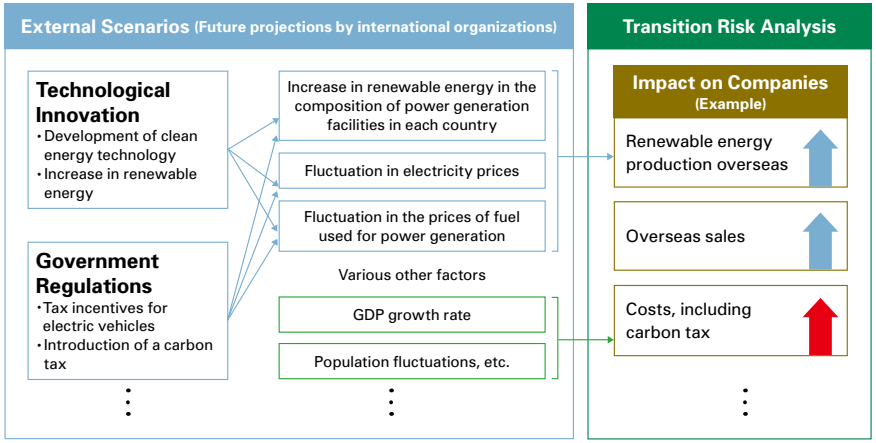
We use three scenarios published by the NGFS. Specifically, we adopted three future scenarios for our analysis. We used the *Current Policies* scenario, which assumes that only the policies currently in place are maintained, and the assumption that annual greenhouse gas (GHG) emissions will not decrease by the year 2030. We then used the *Delayed Transition* scenario, in which strong policies are implemented to limit global warming to 1.5°C through rigorous climate policy and technological innovation. And last, we used the *Net Zero 2050* scenario, which assumes net zero global CO_2 emissions will be achieved in or around the year 2050. We predicted the impact on the Bank's investees and borrowers , while also analyzing the increase or decrease in credit costs. We formed our predictions by combining the Dynamic approach, in which companies make new capital investments in response to climate change, and the Static approach, in which companies do not make additional capital investments in response to climate change.

- In connection with the NGFS scenario for which we lacked sufficient data, our analysis of the electricity and oil-gas-coal sectors incorporated various forecast data from the IEA World Energy Outlook 2021, which is widely used both in Japan and internationally. Data was taken from the Sustainable Development Scenario (SDS), which is a set of measures consistent with achieving the 2°C target of the Paris Agreement, the Stated Policies Scenario (STEPS), which incorporates currently announced policies and targets, and the *Net Zero Emissions by 2050 Scenario*.
- In connection with insufficient data for the analysis of the chemical sector, we referred in part to the IEA's Energy Technology Perspectives 2022 and the STEPS and SDS scenario data contained in the IEA's Ammonia Technology Roadmap October 2021.
- For the food and agriculture and beverage sectors, we used as complementary data various FAO forecast data, Toward Sustainability Systems (TSS) Scenario in which where positive change is required to establish sustainable food and agriculture systems, and Business As Usual (BAU) Scenario, in which past trends and policy directions are maintained as the status quo.

■ Efforts to increase the sophistication of scenario analysis models

- We began disclosing the results of our scenario analysis with our Sustainability Report 2021. We also strive to improve the sophistication of our models to utilize analysis results to better explanation of our position and conducting engagement (constructive dialogue).
- As an example, we made improvements by replacing parameters (variables) in the analysis model to make the analysis results more precise and consistent with real-world perspectives. We will continue to refine the results of our analysis by upgrading our models as necessary.

Reference Analysis Overview Example (Electric power company)



Analysis Target	Selection Scenario	Complementary Scenario
Energy (Electricity, Oil-Gas-Coal)	NGFS ● Current Policies ● Delayed Transition ● Net Zero 2050	IEA World Energy Outlook 2021—SDS, STEPS ● SDS stands for Sustainable Development Scenario ● STEPS stands for Stated Policies Scenario
Food and agriculture, beverages		FAO Food and agriculture projections to 2050—TSS, BAU ● TSS stands for Towards Sustainability Scenario ● BAU stands for Business As Usual
Chemicals		IEA Energy Technology Perspectives 2022-STEP, SSDS IEA Ammonia Technology Roadmap October 2021—STEPS, SDS

Six-Way Scenario Analysis

	Dynamic Approach (An approach reflecting new capital investments in response to market demand)	Static Approach (An approach reflecting the status quo without additional capital investment)
Current Policies (a scenario that assumes that only policies currently in place will be retained)	Current Policies × Dynamic	Current Policies × Static
Delayed Transition (Scenario in which annual GHG emissions do not decline by 2030, followed by strong emissions reduction policies)	Delayed Transition × Dynamic	Delayed Transition × Static
Net Zero 2050 (a scenario that limits global warming to 1.5°C through rigorous climate policy and technological innovation, achieving net zero global CO_2 emissions in or around the year 2050)	Net Zero 2050 × Dynamic	Net Zero 2050 × Static

About the NGFS Scenario Used in This Analysis

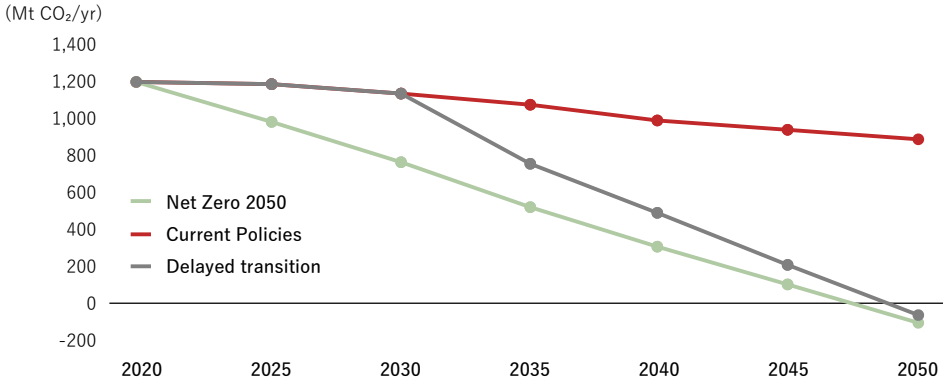
- Our scenario analysis used Version 2 of the NGFS scenario published in 2021. Although three NGFS models exist, we conducted our scenario analysis by adopting the values of the REMIND-MAgPIE model as in the *Pilot Scenario Analysis Exercise on Climate-Related Risks Based on Common Scenarios*, published by the Financial Services Agency and the Bank of Japan, whose results were published in August 2022.

Overview of the NGFS Scenario Used in This Analysis

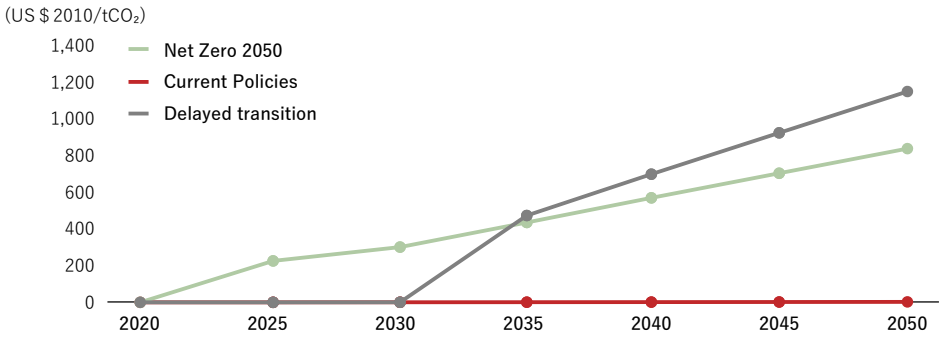
	NetZero 2050	Delayed Transition	Current Policies
Overview	Scenario that limits global warming to 1.5°C through rigorous climate policy and technological innovation, achieving net zero global CO_2 emissions in or around the year 2050	Assumes that annual CO_2 emissions will not decrease until 2030. Assumes strong governmental policies will be implemented thereafter.	Assumes that only policies currently in place will be retained.
Assumed temperature rise (by the year 2100)	Rise of less than 1.5°C	Rise of approximately 1.8°C	Rise of approximately 3°C

- Each scenario in the NGFS has a different worldview assumption. Under the Net Zero 2050 Scenario, strict climate policies and regulations are implemented immediately in each country, promptly reducing CO_2 emissions by companies and other entities. On the other hand, the Current Policies Scenario, in which current policies remain in place, assumes that CO_2 emissions will not be curbed. The Delayed Transition Scenario assumes that strong climate change measures and government policies will be implemented in or around the year 2030, causing a rapid decline in CO_2 emissions beginning in the year 2030.
- Each scenario assumes that governments will impose a tax in the form of a carbon tax (carbon pricing) based on CO_2 emissions. For example, in Japan, the current carbon tax has been introduced on a limited basis as a global warming tax. However, the Current Policies Scenario assumes that this tax system will be maintained permanently. Carbon pricing under the scenarios in question is limited to a tax per ton of CO_2 emissions; however, the Net Zero 2050 Scenario and others incorporate a significant carbon tax.
- Under the Net Zero 2050 Scenario and Delayed Transition Scenario, renewable energy sources such as solar power and wind power are assumed to be the main energy sources in reducing CO_2 emissions.

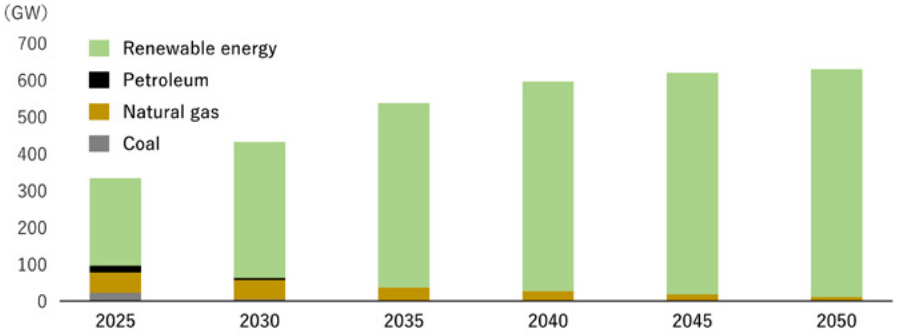
CO_2 emissions (Japan)



Carbon pricing (Japan)



Power generation capacity under the Net Zero 2050 Scenario (Japan)



Transition Risk Scenario Analysis

- Electricity and Oil-Gas-Coal Sectors

  In every scenario, greater demand for renewable energy and stricter regulations on carbon emissions in various countries would result in stranded fossil fuels and reduced market demand. Business whose profits depend on fossil fuel prices will likely see declining performance. On the other hand, companies that view renewable energy as a climate change opportunity tend to increase revenues through capital investment.

- Food and Agriculture and Beverages Sectors

  In every scenario, the global demand for food will increase due to global population growth and other factors. This demand will lead to increased production and increased profits for companies engaged in global business activities. On the other hand, companies whose operations are limited to a specific region may see revenues increase or decrease depending on the characteristics of the region (changes in food culture, population increase or decrease, etc.), and the results of the analysis are mixed.

- Chemicals Sector

  Results varied depending on the chemical products manufactured and the region in which the company operates. The *Delayed Transition Scenario* toward decarbonization and the Net Zero 2050 scenario resulted in slower economic growth. These scenarios revealed relatively lower demand for each chemical product compared to the *Current Policies Scenario*, with the exception of certain products. On the other hand, demand for hydrogen and ammonia as fuels that do not emit CO_2 directly is likely to increase. Demand for functional chemical products used as battery materials is also likely to increase with the wider adoption of electric vehicles; however, price shifts to products should be limited in nature.

- Impact on Credit Portfolio

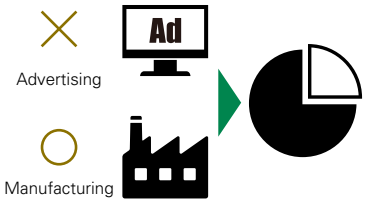
  The total impact of transition risk in the three aforementioned sectors could increase the cost of credit by between 3 billion yen to 22 billion yen per year through the year 2050 (the range is the difference between the Dynamic and Static approaches). The impact on our credit portfolio would be limited.

Using Analysis Results

- Based on the results of the transition risk analysis, we initiated dialogue on climate change initiatives with our investees and borrowers in sectors where we identified a relatively large impact. By sharing an awareness of the issues with our investees and borrowers, we will strengthen our efforts to address climate change together and work toward creating a low-carbon and decarbonized society.
- As the transition to a low-carbon society progresses, the Bank will continue to support the efforts of our investees and borrowers to increase their resilience to climate change. Our support will include recommending ESG loans.

Physical Risk (Acute Risk)/Scenario Analysis Overview

Step 1
Select the sector for analysis



We identified sectors that are highly vulnerable to floods given the nature of their business. For example, advertising was excluded from the analysis because of limited sales loss in case of floods.

Step 2
Identify critical sites

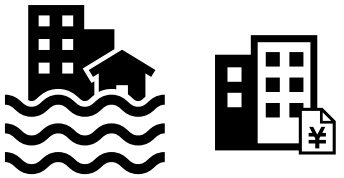
In case of manufacturing

We identified critical sites that would experience a sales decline in case of flood damage for the sectors noted in Step 1. As an example, we assumed that plants are critical sites as they are the base of the manufacturing industry.

Step 3
Identify the amount of damage

We calculated the amount of damage for the critical sites specified in Step 2 as to the degree of impact from the flooding. The total amount of damage was calculated by company for all the critical sites.

Step 4
Calculate the impact on the collateral



We also calculated the amount of flood damage to the mortgage collateral that had been pledged for the Bank.

Step 5
Calculate the credit-related costs

We then analyzed the impact on the Bank based on the amount of damage calculated through the Step 3 and Step 4 processes.

Physical Risk (Acute Risk) and Scenario Analysis Methodology

- We conducted a scenario analysis of flood damage, which has caused significant damage in Japan in recent years. We evaluated impacts through the year 2050. In addition to the key locations of borrowers in Japan, our analysis also covered the impact of flooding on real estate collateral in Japan pledged to the Bank. The analysis scenario was based on the scenario of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).
- The Bank narrowed down the industries to be analyzed, as certain businesses are not affected by floods, depending on the nature of their activities. The next step was to identify which locations in each industry would suffer from flood damage, which would harm sales. We then studied the impact on the critical locations nationwide for our borrowers, and conducted an acute risk analysis that took into account the client's supply chain.
- We also analyzed the real estate collateral pledged to the Bank, as flooding affects the appraised value of such collateral, which in turn affects the cost of credit. We finally analyzed the impact on the Bank's portfolio by taking into account the impact on borrowers and real estate collateral.

Physical Risk (Acute Risk) Analysis Results

The total impact of acute risks will increase the cumulative cost of credit by about 5.0 billion yen through the year 2050, with limited results in connection with the impact on our credit portfolio.

Physical Risk (Acute Risk) Analysis Overview

Analysis Target	(1) Key locations in Japan of borrowers expected to be affected by flooding (2) Real estate collateral pledged to the Bank
Not Analyzed	Industries not expected to suffer flood damage (E.g., finance, advertising, publishing, etc.)
Analysis Scenario	IPCC RCP2.6 and RCP8.5
Risk Quantity	Cumulative credit cost increase of about 5.0 billion yen through the year 2050

Physical Risk (Chronic Risk) Scenario Analysis Overview

Step 1

Estimate the impact on production volume

We analyzed the change in production volume due to climate change. We considered the impact of climate change, for example, higher air temperatures and the precipitation variations regarding rice cultivation.

Step 2

Estimate the impact on prices

We estimated the impact on product prices due to variability in quality or other factors caused by climate change.

Step 3

Provisionally estimate the impact on revenue

We analyzed the impact on revenue for producers considering the analysis in Steps 1 and 2.

Analysis method: Rate of change in production volume + Rate of change in product prices = Rate of change in revenue

Physical Risk (Chronic Risk) and Scenario Analysis Methodology

We conducted a scenario analysis of chronic risks in the agricultural sector, a sector of importance to the Bank. Under the TCFD recommendations, the agricultural sector is considered vulnerable to the impacts of climate change. We believe climate change risk in the agriculture, fishery, and forestry industries will have a significant impact on the continuity of the Bank's business, which is why we conducted this analysis. Note that scenario analysis for the agricultural sector is based on multiple assumptions and hypotheses due to the many limitations of the model: (1) no internationally accepted methods have been established, (2) the data is incomplete, and (3) the impact pathways are diverse and complex. Also note that the analysis targets revenue, not income (i.e., revenue minus expenses, etc.), and thus may differ from the actual impact on agricultural operations.

Our analysis covered rice cultivation and livestock production (milk and beef cattle), which have the largest number of farmers engaged and the greatest production volume. Our analysis estimated the impact of rising temperatures and other factors associated with climate change on the production volume and prices of the commodities analyzed, and finally, we estimated the impact on producer income.

This analysis estimates the change in revenue as of the end of the 21st century compared to the end of the 20th century in two scenarios: (1) one in which no measures are taken to adapt to rising temperatures and (2) one in which measures are taken to adapt to rising temperatures. For the scenarios used in our analysis, we adopted the IPCC RCP 2.6 ("2°C increase") and RCP 8.5 ("4°C increase"), conducting a total of four different analyses.

Rice Crop Analysis Results

[Impact on Production Volume]

4°C Increase: Nationwide production decreases by -6.4% as the optimum temperature for rice cultivation is exceeded across nearly the entirety of the country.

2°C Increase: Nationwide production increases by +3.3% as a wide range of regions, particularly in eastern Japan, experience more suitable temperatures for rice cultivation.

[Price Impact]

4°C Increase: Rice quality (first-class rice ratio) deteriorates, but prices rise by +1.4% due to lower production.

2°C Increase: Prices decrease -1.6% due to increased production and slight deterioration in quality.

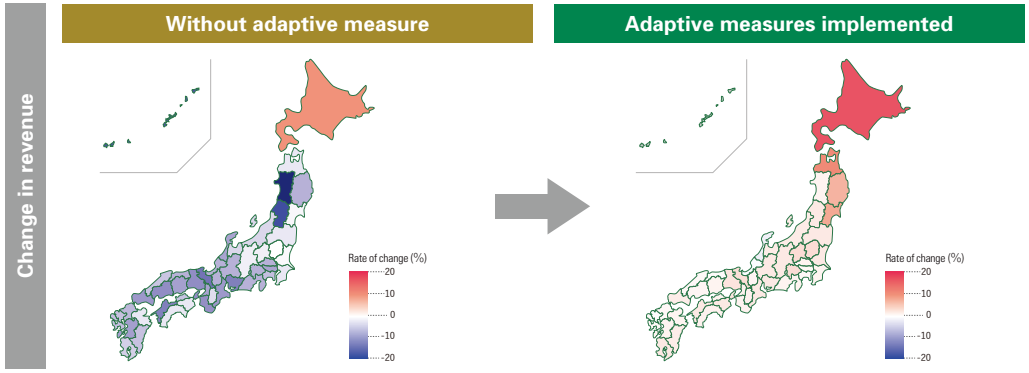
[Revenue Impact (No Adaptation Measures Taken)]

- If temperatures experience a 4°C increase, revenue from rice cultivation could decrease -5.0% by the end of the 21st century (compared to the end of the 20th century) due to a decrease in production and deterioration in quality.
- On the other hand, if temperatures experience a 2°C increase, revenue from rice cultivation would increase with greater amounts of land suitable for rice cultivation, resulting in a +1.7% increase in revenue by the end of the 21st century.

[Revenue Impact (Adaptation Measures Taken)]

- 4°C Increase: Seasonal differences become significant throughout the year. While there is no significant impact in winter, in summer, the hot environment affects milk production, resulting in a decrease of -4.0% during summer, with a decrease of -1.1% in annual production nationwide.

Rice Crop Analysis Results (4°C Increase (RCP8.5))



Raw Milk Analysis Results

[Impact on Production Volume]

4°C Increase: Seasonal differences become significant throughout the year. While there is no significant impact in winter, in summer, the hot environment affects milk production, resulting in a decrease of -4.0% during summer, with a decrease of -1.1% in annual production nationwide.

2°C Increase: There is essentially no precipitation factor and a slight decrease in annual production of -0.2% due to rising temperatures. while production remains unchanged from winter to spring, summer production will decrease roughly -1.0% across all regions.

[Price Impact]

4°C and 2°C Increase: Milk prices are likely to increase due to a decrease in milk production as a result of higher temperatures, resulting in a +0.9% rise in prices for a 4°C increase and a +0.2% rise in prices for a 2°C increase.

[Revenue Impact (No Adaptation Measures Taken)]

- Our analysis indicates that milk production revenue will likely decrease by a maximum of -0.1%, remaining nearly unchanged at ±0.0% through the end of the 21st century compared to the end of the 20th century. This result is likely to be the same, regardless of whether the temperature increases by 4°C or 2°C. This result is due to an increase in prices to offset the impact of lower production volume.

[Revenue Impact (Adaptation Measures Taken)]

- We conducted our analysis assuming the adoption of and advancements in fine misting equipment used as an adaptation measure in raw milk production. The analysis shows that adaptation measures should limit the impact of increasing temperatures and ensure that revenues remain flat.

Beef Cattle Analysis Results

[Impact on Production Volume]

- We conducted separate analyses, assuming that Japanese Wagyu and other domestic cattle have different heat tolerances.
  4°C Increase: The rise in temperature affected cattle fattening, resulting in a decrease of -0.8% in Wagyu beef carcass production and a decrease of -1.6% in the beef carcass production of domestic cattle, resulting in a -1.2% decrease in the beef carcass production nationwide.
  2°C Increase: Japanese Wagyu cattle, domestic cattle, and national production experienced minor decreases at -0.2%, -0.4%, and -0.3%, respectively.

[Price Impact]

4°C and 2°C Increase: We calculated a rise of +0.6% in take-home pay for a 4°C increase and a rise of +0.2% for a 2°C increase. This increase was due to supply and demand factors and subsidies under the Beef Cattle Marukin system.

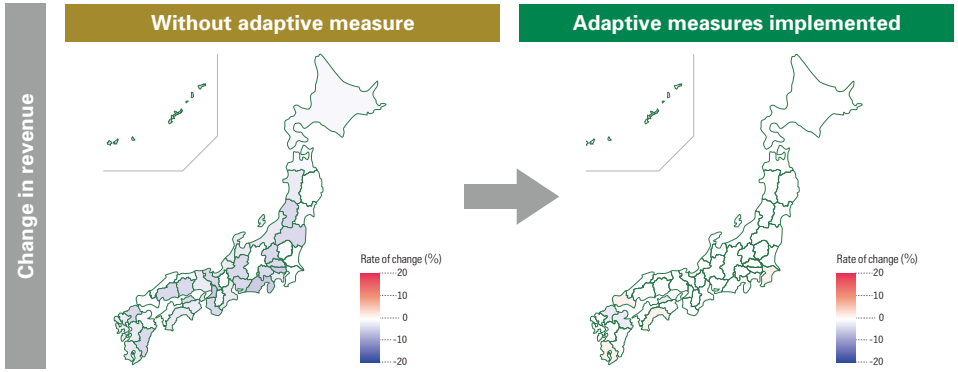
[Revenue Impact (No Adaptation Measures Taken)]

- Our analysis indicates that revenue from beef cattle fattening will decrease by -0.6% by the end of the 21st century if the temperature increases by 4°C. If the temperature increases by 2°C, revenue will decrease by -0.2%. While Japanese Wagyu beef should experience a slight increase in revenue under either scenario, domestic cattle is likely to see a maximum decrease in revenue of -1.4%, mainly due to a decrease in production volume.

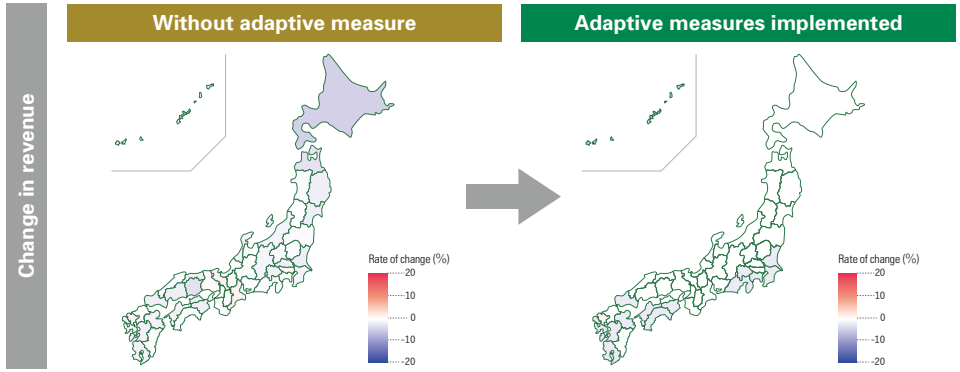
[Revenue Impact (Adaptation Measures Taken)]

- We conducted our analysis assuming the adoption of and advancements in fine misting equipment used as an adaptation measure, similar to that used in raw milk production.As with raw milk production, our analysis indicates that adaptive measures can ensure flat or modest increases in revenue.

Raw Milk Analysis Results (4°C Increase (RCP8.5))



Beef Cattle Analysis Results (4°C Increase (RCP8.5))



Physical Risk (Chronic Risk) and Scenario Analysis Details

Climate Change Scenario

- We evaluated multiple climate change scenarios and adaptation measures to identify and analyze the long-term impacts of climate change from multiple perspectives.
- The Climate Change Scenario utilized IPCC RCP8.5 and RCP2.6 to analyze climate change impacts by prefecture in Japan.

Analytical Model and Climate Variables

We developed climate change assessment models for rice cultivation and livestock production were developed based on previous studies and other data. The following provides an overview of the model we used

[Rice Cultivation]

- Using time series data, we constructed a model to explain production volume in terms of cropland area, temperature, rainfall, and sunshine hours. We incorporated the Climate Change Scenario into our model to estimate changes in production.
- In addition, we estimated the supply-demand factor based on price elasticity with respect to production volume, using consumer price index data. We estimated the quality factor based on changes in the ratio of first-class rice (the ratio of first-class rice to the inspected quantity of unpolished rice) due to climate change.

[Raw Milk]

- We constructed a model to explain production volume in terms of the number of cattle raised, temperature, rainfall, and hours of sunlight. We used monthly data, since cattle are produced throughout the year. We incorporated the Climate Change Scenario into our model to estimate changes in production. We excluded the impact on reproduction due to data constraints and other factors.
- We estimated price elasticity using milk prices and other statistical data.

[Beef Cattle]

- We constructed a model to explain production volume in terms of the number of livestock, integral temperature, cumulative rainfall, and cumulative hours of sunlight. We used monthly data, since cattle are produced throughout the year. We incorporated the Climate Change Scenario into our model to estimate changes in production. We excluded the impact on reproduction due to data constraints and other factors.
- We estimated price elasticity using milk prices and other statistical data, and incorporated the Beef Cattle Marukin system into our model.

Adaptation Measures

We examined the effects of adaptation measures used in previous studies, etc., as well as measures for which the technology has been established and adopted in real-world practice. We analyzed the effects of these technologies on climate change, particularly temperature increase, within the model, referencing previous studies.

Analysis Results and Implications

- We did not take into account the cost of adaptation measures in terms of revenue impact. Cost-effectiveness must be considered when introducing adaptation measures in the real world.

[Rice Cultivation]

- In the case of a 4°C increase, the rate of change in revenue without adaptation measures resulted in large differences in the range of change in revenue among prefectures. This result suggests a factor related to temperatures during the maturation period and regional differences in crop varieties.

[Raw Milk]

- We noted widening differences in production volume by season and by region. This result suggests the possibility of a summer/winter supply-demand gap and the need to address inter-regional transport further.

[Beef Cattle]

- Japanese Wagyu and other domestic cattle differed in heat tolerances, suggesting that Wagyu cattle are more tolerant to heat.
- This result suggests that the Beef Cattle Marukin system is effective in reducing the revenue impact of production fluctuations, etc., due to climate change.

Analysis Data

We obtained data mainly using published sources from government agencies such as the Ministry of Agriculture, Forestry and Fisheries and the Japan Meteorological Agency.

Model Limitations and Notes

- Our analysis is based on the business revenue factors related to production volume and price. Our analysis did not cover business expenditures (expenses) such as feed costs in the livestock industry, nor did we address fluctuations in demand.
- Our analysis was based on the best information available. However, we do not claim that the data was complete and the data used was subject to uncertainties. In addition, our analysis was based on multiple assumptions and hypotheses, reflecting a variety of complex impact paths.
- Therefore, the Bank recognizes that the results of this analysis reflect results only to the extent possible at this time. We recognize that we must improve and refine the information inputs, while improving the analytical models themselves.
- In addition, our analysis was of the impact on producer revenue. The Bank recognizes that further study is required to build an analytical model to analyze the impact on the Bank's finances, as we must identify highly probably paths among a number of complex impact paths.

Initiatives to Advance Physical Risk Scenario Analysis

Our analysis of physical risk to date consists of flood damage analysis (acute risk analysis) for the key locations in Japan of our borrowersHowever, we will consider expanding our analysis to include the impact on the overseas locations of our borrowers, as well as the impact on various Bank's locations.

In terms of chronic risk analysis, we intend to examine the impact of rising temperatures on fisheries, while also confirming the feasibility of the analysis itself.

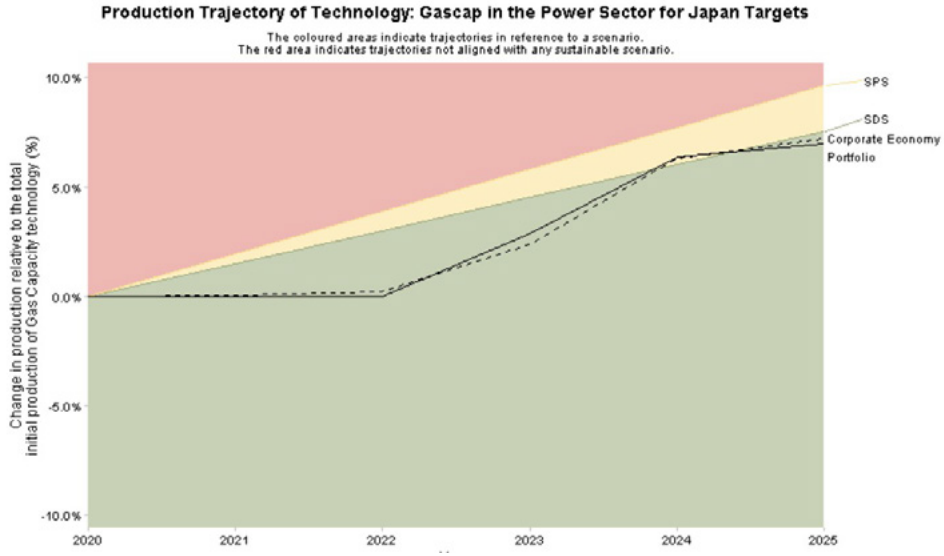
	Analysis Targets	FY2022	FY2023
Transition Risk	Target Sector	Energy (Electricity, Oil-Gas-Coal), Agriculture and Food, Beverage, Chemicals	
	Scenarios	Each NGFS Scenario ● Current Policies ● Delayed Transition ● Net Zero 2050	
Physical Risk Analysis	Analysis Targets	Acute Risk: Analysis of flood damage to the key locations in Japan of our borrowers Chronic Risk: Consider the following initiatives in addition to the initiatives listed to the left regarding analysis of the impact of temperature increase and precipitation change on the agricultural sector (rice cultivation and livestock production).	Acute Risk: Analysis of flood damage to the overseas locations of borrowers Flood damage analysis with respect to each Bank's location Chronic Risk: Analysis of the impact of rising temperatures and other factors on the fisheries sector
	Scenario	IPCC 2°C, 4°C scenario	

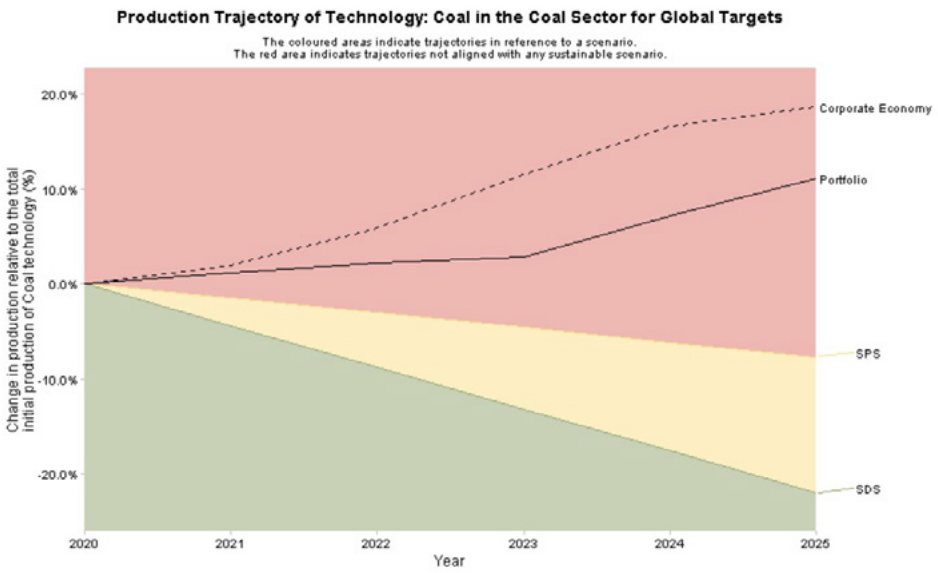
Other Scenario Analysis Efforts (Finance Portfolio Analysis)

The Bank participated in a transition risk analysis project conducted by the Financial Research Center of the FSA, using the 2 Degrees Investing Initiative (2DII) tool to conduct risk analysis of several banks in Japan. The project uses the Paris Agreement Capital Transition Assessment (PACTA)*, a tool for analyzing the transition risk of loan portfolios, to analyze the lending balances of participating banks for consistency with a scenario of transition to a low-carbon economy and for exposure to climate-related risks. Sectors covered are the high-emission sectors of oil and gas (upstream), coal (mining), electricity (power generation), and automobiles (auto manufacturing). The analysis identifies sectors, technologies, and capital stock that are consistent/inconsistent with ambitious climate scenarios, using projections of production volume trends for borrowers.

Consistency With Ambitious Climate Scenarios

According to the analysis, among the sectors targeted by PACTA, overall lending balances are only consistent with the goals of the ambitious climate scenarios about only a few subsectors (gas-fired power generation and hybrid vehicle manufacturing), while other sectors are inconsistent with said goals. In particular, the coal mining and oil and gas (upstream) sectors, as well as parts of the fossil fuel-dependent auto and power generation sectors, demonstrate the greatest risk of weakened profitability due to the need for rapid decarbonization. These results apply not only to the participating banks as a whole, but also in general to non-consolidated Norinchukin Bank balances.





* PACTA is a tool developed by 2Dii with the cooperation of the Principles for Responsible Investment (PRI) to support disclosures under TCFD, Article 173 of the French Energy Transition Law, the UK insurance stress test, etc.

Change Rate in Probability of Default by Sector in Response to Policy Change Shock

In addition to consistency with the Climate Scenario, we analyzed the rate of change in the probability of default (PD) for borrowers due to future transition policy shock. A comparison of the change rate in PD by sector within the Bank's loan portfolio by industry sector indicates that, in order, auto manufacturing, coal (mining), and oil and gas (upstream) had the greatest impact on PD due to delayed transition. The main reason related to auto manufacturing PD is the lack of substitution toward low-carbon fuels. In the case of electricity, the impact is only minor due to the effects of new low-carbon technologies.

Furthermore, we conducted a sensitivity analysis by year that suggested the greater delay in policy change, the greater the delay in the transition among finance clients, leading to a greater impact on PD. PD tended to be higher in the fossil fuel sector, including coal mining and oil and gas (upstream) in particular, due to delays in transition.

It should be noted, however, that these results are only an analysis of the current situation. Risks may change in the future with real-world progress in substitution among borrowers, developments of alternative technologies, etc.

In terms of the results of our analysis, the analysis itself was limited to a few sectors related to climate change (about 7% of the Bank's loanportfolio) and the share of non-consistent sectors across the total loan portfolio is not significant. Therefore, we believe the impact on our overall finance portfolio is likely to be limited. This was also the case in the aforementioned transition risk impact analysis separately undertaken by the Bank, and we infer that, at least under the current analysis methodology, the impact of transition risk on the Bank's finance portfolio is likely to be limited.

We intend to combine or supplement the results obtained from this analysis with results from scenario analyses under other analytical methodologies and data sources to assess the combined impact on the Bank.