Contribution for Mitigation and Adaption to Climate Change

The AFF industries are the foundation of the Bank. These industries are prone to incur the negative impact of climate change and, at the same time, have the potential to amplify climate change.
Our response to climate change contributes to the development of the AFF industries, which is the mission of the Bank. We pursue efforts to mitigate and adapt to climate change through our business activities, focusing on climate-related opportunities and risk management. As part of those efforts, we are addressing the impact and risks of climate change on our business in an appropriate manner, engaging in initiatives and enhancing our disclosures based on the TCFD recommendations. In fiscal 2021, the Bank analyzed the effects of flood damage, which is an acute physical risk, and the impact of chronic risks on the volume of rice/livestock production and their product prices in the agricultural sector.

Governance for Addressing Climate Change

The Norinchukin Bank holds regular meetings of our Sustainability Committee (under the Board of Directors) to discuss policies addressing environmental and social issues, including climate change, and the status of our initiatives. The outcomes of the Sustainability Committee meetings are reported to the Board of Directors and the Supervisory Committee as needed. In addition, the Bank has assigned Chief Sustainability Officers (Co-CSuOs) who are responsible for supervising and promoting initiatives to solve environmental and social issues, including climate change. Furthermore, the Bank established the Sustainability Advisory Board as an advisory body to the Board of Directors to advance its sustainable management by incorporating the opinions of external experts.

Climate-Related Opportunities

Climate change is a future risk. At the same time, we can find business opportunities in mitigating and adapting to this climate 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. This is one way in which we can support the transition to a decarbonized society through financing services.

● Initiatives Through Sustainable Financing

We support the initiatives of our investment and finance clients for climate change issues through sustainable financing.

- Make impact investments that have positive effects on the environment and society → P35
- Launch ESG loans, including sustainability-linked loans → P36
- Engage in project finance throughout the world → P54

● Initiatives for Ensuring the Sustainability of Forests and the Forestry Industry

We are engaged in various initiatives to sustain and revitalize the forest function to absorb carbon dioxide.

→ P32

Impact Analysis of Climate-Related Risk

Climate-related risks commonly comprise two main risk drivers: transition risk and physical risk. 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 investment and financing of clients that have high emissions. This in turn could result in higher credit costs for financial institutions. Physical risk refers to the risk that disasters (e.g., floods) caused by climate change could increase. The Bank conducts scenario analyses on these risks and discloses the results.

Risks Posed to the Bank by Climate Change

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

Climate-Related Risk Assessment by Sector

The impact of climate change will become even more apparent over the medium to long term, and said impact will vary depending on the sector in which our investment and financing clients operate.

Therefore, we evaluated where and when transition and physical risks would occur, targeting sectors and other areas defined by the TCFD recommendations. The manifestation of risks associated with climate change is caused by various external factors, environments and transmission channels. We created the heat map below after identifying these risks and factors. The heat map shows (in chronological order) the impact of these risks on the sectors in which the Bank has the most financial exposure. Our analysis also reflects the effects of climate change at different times according to region, geographic conditions and jurisdiction. As one example, transition risks in the European Union are expected to manifest 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-Related Risk (Scenario Analysis)

We conduct scenario analyses to understand the impact of climate-related risks on our credit portfolio and finances. Our target sectors for transition risk analysis consist of the electric utilities and oil-gas-coal sectors. Our evaluations on the left side of the chart indicate these sectors as having high climate-related risks, as do the food and agriculture and beverages sectors, which form the food and agricultural value chains. Through scenario analysis for these sectors, we evaluated the medium- to long-term changes in credit costs caused by the progress of decarbonization in fiscal 2020.

We used the scenarios published by the representative 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 Me Finance Initiative (UNEP FI) with the objective of discussing and developing methods for climate-related financial information disclosure in the banking industry.

Regarding Japan, which is judged as a high-risk region according to the risk evaluations on the left side of the chart, we additionally conducted scenario analyses in fiscal 2021 on its acute and chronic physical risks.

Among the acute risks, the Bank analyzed flood damage, which has been severe in recent years, specifically concerning its effects on the important business locations in Japan of domestic borrowers and on mortgage collateral held by the Bank.

As for chronic risks, the Bank analyzed the impact of chronic physical risks on the agricultural sector, which is important to the Bank as its business is based on the AFF industries. The analysis was conducted on the volume of rice/livestock production and their product prices (raw milk and beef cattle), studying the effects of climate change, including rising temperatures, on the income of producers and how to address those effects.

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

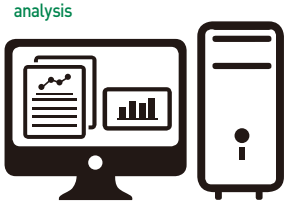
■ External scenario data

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

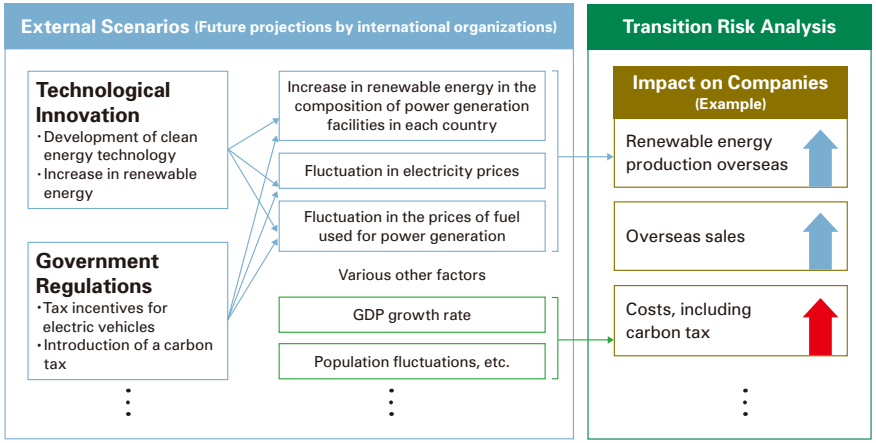
*2 The term of the analysis differs depends on the target sector. We analyzed energy-related sectors through 2042, which is in line with the period for which selected scenario data are provided. We analyzed other sectors through 2050.

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

Methodology for Transition Risk Scenario Analysis

- Based on the results of our qualitative assessment of climate-related risks, we selected the electric utilities, oil-gas-coal, food and agriculture, and beverage, sectors as targets for transition risk scenario analysis. The electric utilities and oil-gas-coal sectors have been identified in the final TCFD report and by the Sustainability Accounting Standards Board (SASB) as sectors with high carbon emissions that are highly vulnerable to transition risks. Hence, we believe our selection of companies for scenario analysis was in compliance with these international initiatives and global standards. 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 financing portfolio, the analysis covers not only domestic and overseas lending clients but also our investment clients in corporate bonds.
- Our analysis of the electric utilities and oil-gas-coal sectors incorporates various forecast data from the IEA World Energy Outlook, which is widely used internationally including Japan. The future scenarios we referenced include the Sustainable Development Scenario (SDS = 2°C scenario), which incorporates measures consistent with achieving the 2°C target of the Paris Agreement, and the Stated Policy Scenario (STEPS = 4°C scenario), which incorporates currently announced policies and targets. We predicted the impact on Bank investments and loans, 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.
- For the food and agriculture and beverages sectors, we used FAO forecast data and future scenarios: the toward sustainability scenario (TSS = 2°C scenario in which changes are made proactively to establish sustainable food and agriculture systems) and the business as usual scenario (BAU = 4°C scenario in which past trends and policy directions are maintained). Using the same approach as with the electric utilities and oil-gas-coal sectors, we examined the impact on the Bank's credit portfolio, including the impact on our investment and financing clients.

Reference Analysis Overview Example (Electric power company)



Analysis Target	Selection Scenario
Energy (electric utilities, oil-gas-coal)	IEA World Energy Outlook 2019 – SDS, STEPS ・SDS stands for Sustainable Development Scenario and corresponds to the 2°C scenario ・STEPS stands for Stated Policies Scenario and corresponds to the 4°C scenario
Food and agriculture, beverages	FAO food and agriculture projections to 2050 – TSS, BAU ・TSS stands for Toward Sustainability systems and corresponds to the 2°C scenario ・BAU stands for Business as Usual and corresponds to the 4°C scenario

Four-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)
4°C Scenario (A scenario reflecting only established policies that have already been formulated)	**4°C Scenario × Dynamic**	**4°C Scenario × Static**
2°C Scenario (A scenario reflecting measures necessary to achieve the 2°C target of the Paris Agreement)	**2°C Scenario × Dynamic**	**2°C Scenario × Static**

Transition Risk Scenario Analysis Results

- Electric Utilities and Oil-Gas-Coal Sectors

  The Static approach increased credit costs by approximately ¥4 billion per fiscal year, while the Dynamic approach did not incur any additional credit costs. Looking at the trends for each of our investment and finance clients, we identified the financial impact stemming from stranded assets in power generation facilities due to the spread of renewable energy and the cost of a carbon tax. These trends were notable for power companies in particular, which reflect the high ratio of thermal power generation. On the other hand, electric power companies expanding their business in Asia and other regions are capturing climate change as an opportunity. These entities are trending toward increased profits through capital investment in renewable energy and low-carbon technologies.
- Food and Agriculture and Beverages Sectors

  In both the Dynamic and Static approaches, the credit cost increased by approximately ¥1 billion per fiscal year. Looking at the medium- to long-term changes in our investment and financing clients based on the scenarios, we recognized the negative impact of a changing market in Japan and other countries. This market change included a decrease in meat consumption due to changes in dietary habits, stemming from a growing consumer sentiment of sustainability. In contrast, companies with operations overseas in Asia and other regions showed a positive trend. Increased demand due to population growth and economic growth supported earnings.
- Impact on Credit Portfolio

  The total impact of transition risk in the two aforementioned sectors could result in increases of the credit cost by approximately ¥1 billion −¥5 billion per fiscal year through 2042 (the range is due to the difference between the Dynamic and Static approaches). Thus, the impact on our credit portfolio is deemed to be limited.

Using Analysis Results

- Based on the results of the transition risk analysis, we initiated engagement (constructive dialogue) on climate-related issues with our investment and financing clients in sectors where we identified a relatively large impact. By sharing an awareness of the issues with our investment and financing clients, 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 investment and financing clients to increase their resilience to climate change. Our support will include promoting ESG loans.

Detailed Results of Transition Risk Scenario Analysis for the Food and Agriculture and Beverages Sectors

(1) Overview of the Assumed FAO Scenario

4°C Scenario	2°C Scenario
● A scenario assuming that only fixed policies currently in effect will be implemented ● Despite the efforts of many countries, food and agriculture issues remain unresolved	● A scenario in which universal and sustainable access to safe and nutritious food is achieved in a way that is sustainable for the environment ● A state in which proactive change is implemented toward a more sustainable food and agricultural system

(2) Analysis Results by Region, Scenario and Approach

Region	Dynamic		Static
	4°C Scenario	2°C Scenario	4°C / Common to both 4°C and 2°C Scenarios
High-income countries (including Japan)	・Likely increase of corporate earnings due to robust economic growth ・Maintenance of existing food culture	・Decreasing demand for animal-based foods due to a greater awareness of sustainability; increasing demand for vegetable and fruit-based foods	・Limited increase in earnings as production volume remains unchanged due to lack of capital investment to meet increased demand
Low- and middle-income countries	・Continued increase in demand for grains and other products due to population growth	・Higher economic growth compared to the 4°C scenario, and increased demand for animal products due to more diverse diets in line with higher income levels	

(3) Post-Analysis Considerations

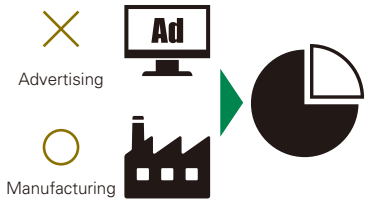
In both the 4°C and 2°C scenarios, the demand for food on a global level will increase due to global population growth and other factors. This demand will lead to increased production and increased profits. In the 2°C scenario, significant economic growth is expected in low- and middle-income countries experiencing large population growth. Demand for food grows more than under the 4°C scenario. Therefore, companies with global operations increase their profits under both scenarios, while the results for companies operating in specific regions vary depending on the characteristics of those regions. Companies that produce mainly in Japan, where the population is expected to decline, have already been impacted by a decrease in animal product consumption and an increase in vegetable and fruit plant product consumption stemming from greater consumer sentiment of sustainability.

Our scenario analysis also confirmed that, in addition to regional characteristics, the products handled and business structure (e.g., upstream versus downstream) are influential factors.

We will continue to work on expanding the number of sectors we analyze and refining our analysis methodology.

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)/Scenario Analysis Overview

- We implemented scenario analysis for flood damage, which has caused heavy losses in recent years in Japan. The analysis was intended to assess the impact of flooding for the period until 2050. The analysis covers not only critical domestic sites of domestic lending clients but also the impact of flooding on domestic mortgage collateral that has been pledged for the Bank. We assumed analytical scenarios adopted in the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC).
- The Bank selected sectors as analysis targets because some sectors are not vulnerable to the impact of flooding. As a subsequent step, we identified by industry whether sales of corporations decreased when any of the relevant sites was damaged by flooding. Furthermore, we investigated the impact of flooding on critical sites nationwide of domestic lending clients and conducted acute risk analysis while taking into consideration the relevant companies' supply chains.
- In addition, we conducted analyses for the mortgage collateral pledged for the Bank, because those assessed amounts are influenced by flooding, thereby affecting the credit cost. We conclusively analyzed the impact on the Bank's portfolio by factoring in the impact from lending clients and that of mortgage collateral.

Physical Risk (Acute Risk) Analysis Results

The accumulated total is expected to increase by about ¥5 billion in credit costs by 2050 if the impact of acute risks is summed up, resulting in limited impacts to the Bank's credit portfolio.

Physical Risk (Acute Risk) Analysis Overview

Analysis Target	1) Domestic critical sites of domestic lending clients at which flood damage is expected to occur 2) Mortgage collateral that has been pledged for the Bank
Excluded from Analysis Target	Sectors for which flood damage is not expected to occur (e.g., Finance, Advertising, Publishing)
Analytical Scenario	IPCC's RCP2.6 and RCP8.5 scenarios
Increase in Credit Costs	The accumulated total of credit costs is expected to increase by about ¥5 billion by 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

Methodology for Physical Risk (Chronic Risk) Scenario Analysis

We implemented scenario analysis for chronic risks in the agricultural sector, which is vital to the Bank. The TCFD recommendations refer to the agricultural sector as an industry vulnerable to climate change. In addition, we conducted the scenario analysis because the climate change risk in the AFF industries is deemed to have considerable impact on the business continuity of the Bank. Meanwhile, as the scenario analysis for the agricultural sector has numerous limits in the model represented by 1) the lack of available methodologies established globally, 2) imperfect or poor data and 3) diversified and complicated impact channels, several assumptions and hypotheses are made in the analysis. In addition, note that the impact of the scenario analysis might be different from the actual impact on farm management because the analysis target is revenue, not income (i.e., the amount after deducting expenses, etc., from revenue).

We selected rice cultivation and animal husbandry (milk, beef cattle), for which there are numerous engaged farmers and high production volume, as analysis target items. In the analysis, while estimating the impact of higher air temperature due to climate change on production volume and product prices of the target items, we provisionally estimate the impact on revenue for producers conclusively. See page 26 for the detailed analysis method.

In the analysis, we estimated changes in revenue for producers at the end of the 21st century compared with that at the end of the 20th century in two opposite directions, that is, the case where no measures will be taken against the case where appropriate measures will be taken to cope with temperature rise. In our analysis, we employed IPCC's RCP2.6 analysis scenario (corresponding to "temperature rise of 2°C" below) and RCP8.5 scenario (corresponding to "temperature rise of 4°C" below), therefore conducting analysis in four different patterns.

Analysis Results for Rice Cultivation

[Impact on production volume]

Temperature rise of 4°C: The production volume nationwide would decrease 6.4% as air temperature will exceed the suitable temperature for rice cultivation almost all over the country.

Temperature rise of 2°C: The production volume nationwide would increase 3.3% as air temperature will remain at a suitable temperature for rice cultivation for wider regions centering on East Japan.

[Impact on prices]

Temperature rise of 4°C: The price of rice would increase 1.4% due to decreased production volume although rice quality (percentage of first-class rice) could deteriorate.

Temperature rise of 2°C: The price of rice would decrease 1.6% due to increased production volume and a slight deterioration of quality.

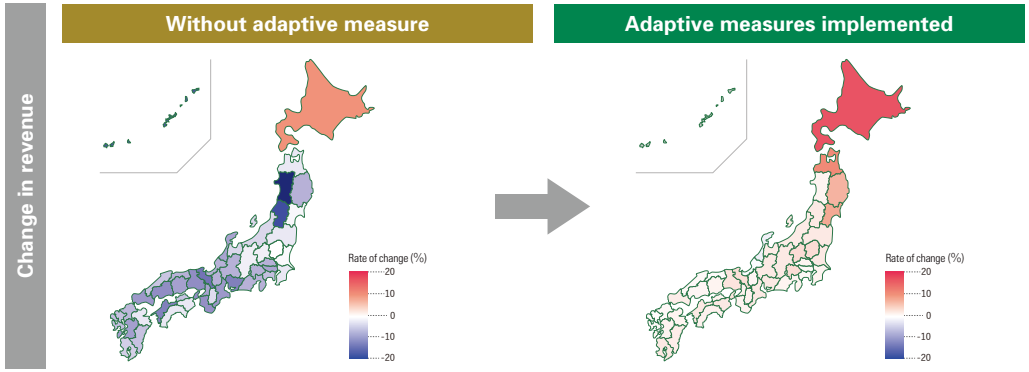
[Impact on producers' revenue (without adaptive measures)]

- For a temperature rise of 4°C, the revenue associated with rice cultivation might decrease 5.0% at the end of the 21st century compared with that at the end of the 20th century due to a decline in production volume and quality deterioration.
- On the other hand, for a temperature rise of 2°C, revenue is expected to increase 1.7%, reflecting the expected expansion of appropriate land areas for rice cultivation.

[Impact on producers' revenue (adaptive measures implemented)]

- For a temperature rise of 4°C, revenue increased 3.5% nationwide (8.5% higher compared to the case where adaptive measures were not taken) by implementing two adaptive measures: 1) introducing high-temperature resistant varieties, and 2) moving forward the transplanting date of rice seedlings by 1–2 months. However, cost calculation related to the adaptive measures is difficult at this time, and therefore such calculation is not taken into consideration (in common with milk and beef cattle). Note that the relevant amounts might decrease at the income level after deducting expenses, etc., from revenue.

Analysis Results for Rice Cultivation (with temperature rise of 4°C (RCP8.5 scenario))



Analysis Results for Milk

[Impact on production volume]

Temperature rise of 4°C: Although seasonal differences would be considerable through the year and great impact would not be caused in winter, the hot environment in the summer would have adverse effects on milk production volume, reducing it by 4.0%. This would result in a slight reduction of 1.1% in annual milk production volume nationwide.

Temperature rise of 2°C: The precipitation factor would have almost no impact. The annual production volume would decline by only 0.2% due to the temperature rise. Milk production volume would decrease by approximately 1.0% in the summer in most regions nationwide, whereas milk production volume would remain unchanged during the winter and spring.

[Impact on prices]

Temperature rise of 4°C and 2°C: The reduction in milk production volume due to temperature rise is expected to raise milk prices. Prices are expected to increase 0.9% with a temperature rise of 4°C and 0.2% with a temperature rise of 2°C.

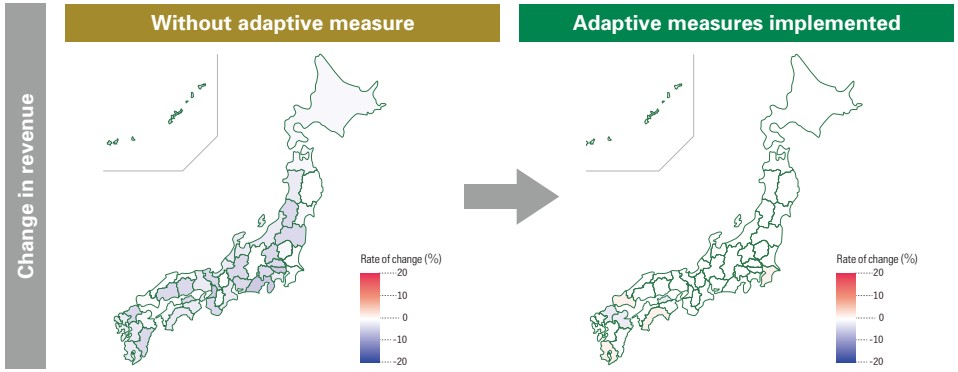
[Impact on producers' revenue (without adaptive measures)]

- The analysis shows that the revenue for milk producers would remain almost unchanged at the end of the 21st century compared with that at the end of the 20th century, with a reduction of 0.1% for a temperature rise of 4°C and of ±0.0% for a temperature rise of 2°C, at maximum. The impact of reduced milk production would be offset by the expected price rise.

[Impact on producers' revenue (adaptive measures implemented)]

- We conducted analyses after assuming that fine-mist spraying equipment would be widely used and become more sophisticated as an adaptive measure to be implemented in milk production. The analysis shows that the application of this measure would restrict the impact of a temperature rise, thereby ensuring that revenue would remain unchanged.

Analysis Results for Milk (with temperature rise of 4°C (RCP8.5 scenario))



Analysis Results for Beef Cattle

[Impact on production volume]

- Assuming that Wagyu cattle and other domestic beef cattle differ in high-temperature resistance, we conducted analyses separately for both cattle varieties.
  Temperature rise of 4°C: Fattening cattle will be affected by a temperature rise. Carcass production of Wagyu cattle would decrease 0.8% and that of domestic beef cattle by 1.6%, leading to a reduction in national production volume of 1.2%.

Temperature rise of 2°C: Carcass production of Wagyu cattle would decrease 0.2% and that of domestic beef cattle by 0.4%, leading to a modest decrease in national production volume of 0.3%.

[Impact on prices]

Temperature rise of 4°C and 2°C: The take-home price is expected to increase 0.6% with a temperature rise of 4°C and 0.2% with a temperature rise of 2°C, depending on the supply-demand factor and the effects of the Beef Cattle Fattening Management Stabilization Grant (so-called *Ushi-Marukin* system).

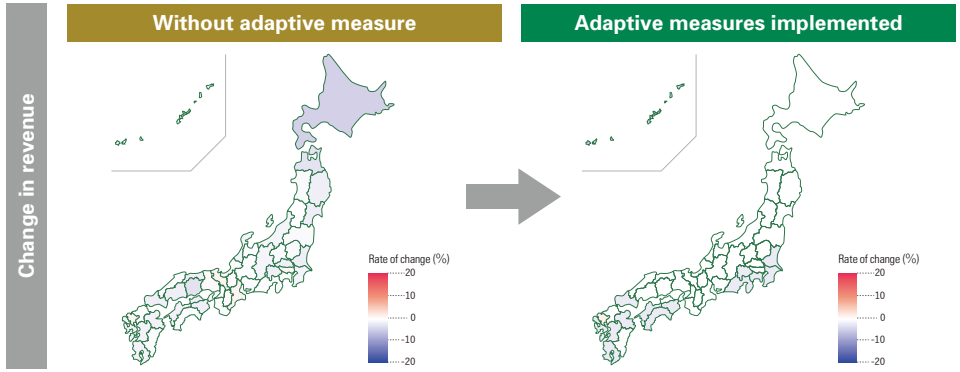
[Impact on producers' revenue (without adaptive measures)]

- The analysis shows that the revenue for overall beef cattle fattening would decrease at the end of the 21st century compared with that at the end of the 20th century with a reduction of 0.6% for a temperature rise of 4°C and of 0.2% for a temperature rise of 2°C, at maximum. A slight increase in revenue might be guaranteed for either scenario on Wagyu cattle, but there is a possibility that revenue could decrease 1.4% regarding other domestic cattle, at maximum.

[Impact on producers' revenue (adaptive measures implemented)]

- We conducted analyses after assuming that fine-mist spraying equipment would be widely used and become increasingly sophisticated as an adaptive measure to be implemented in cattle fattening, just as with milk production. The analysis shows that the application of this measure would mitigate the impact of the temperature rise, thereby ensuring revenue would remain unchanged or increase slightly as with milk production.

Analysis Results for Beef Cattle (with temperature rise of 4°C (RCP8.5 scenario))



Detailed Physical Risk (Chronic Risk) Scenario Analysis

Climate Change Scenario

- To understand and analyze the long-term impact of climate change from multifaceted perspectives, we evaluated the impact by using plural climate change scenarios and adaptive measures.
- We employed the IPCC's RCP8.5 and RCP2.6 analytical scenarios to analyze the impact of climate change by prefecture.

Analytic Model/Climate Change Parameter

We established climate change assessment models in relation to rice cultivation and animal husbandry, based on previous research and other materials. The overview of the analytic models is as described below.

[Rice cultivation]

- We established an assessment model to explain production volume in terms of land area planted, air temperature, precipitation, hours of sunlight and other factors using time-series data. We estimated the change in production volume by incorporating several climate change scenarios into this model.
- In our model, we explained the impact on prices using the supply-demand and quality factors. The supply-demand factor was estimated in terms of price elasticity against production volume using such data as the consumer price index, whereas the quality factor in terms of the change in percentage of first-class rice (ratio of first-class rice in the quantity of wet land non-glutinous rice inspected) due to climate change.

[Milk]

- We established an assessment model to explain production volume in terms of number of cattle fed, air temperature, precipitation, hours of sunlight and other factors. We adopted monthly data as milk is produced throughout the year. We estimated the change in production volume by incorporating climate change scenarios into this model. The impact on breeding was excluded due to restrictions on data and other factors.
- In our model, we used data such as milk prices to estimate price elasticity against production volume.

[Beef cattle]

- We established an assessment model to explain production volume in terms of the number of slaughtered cattle, cumulative temperature, cumulative precipitation, cumulative hours of sunlight and other factors. We adopted monthly data as cattle are fed throughout the year. The impact on breeding was excluded due to restrictions on data and other factors.
- In our model, we used data such as beef prices to estimate price elasticity against production volume, and the *Ushi-Marukin* system for beef cattle was incorporated via modeling.

Adaptive Measures

We examined the possible resulting effects of the adoptive measures centering on those that have been adopted in previous research and other materials, and for which related technology has been established and introduced. We conducted analyses in the models while referring to previous research on what effects have been proven against climate change–based events, especially a rise in temperature.

Analysis Results and Suggestions

- In estimating the impact on revenue, the costs for introducing adaptive measures were not taken into consideration. In implementing an adaptive measure, cost-effectiveness thereof should be examined in advance.

[Rice cultivation]

- For a temperature rise of 4°C, the analysis showed that variations differed considerably by prefecture regarding the rate of change in revenue. The analysis suggested that regional differences exist in terms of air temperature during the ripening period and/or planted varieties.

[Milk]

- The analysis showed substantive differences in production volume depending on season and region. The analysis suggested the possibility of further strengthening the response to the supply-demand gap between summer and winter and/or increasing interregional transportation.

[Beef cattle]

- The analysis suggested that Wagyu cattle and other domestic beef cattle differ in high-temperature resistance with Wagyu cattle having shown stronger resistance.
- The analysis suggested the *Ushi-Marukin* system for beef cattle has the impact of mitigating the impact on the change in production volume due to climate change.

Analytical Data

We obtained relevant analytical data from among the published data of certain government agencies, mainly the Ministry of Agriculture, Forestry and Fisheries and the Japan Meteorological Agency.

Limits Inherent in Our Models and Points of Concern

- This analysis is associated with production volume and prices, which are key factors in business revenue, but business spending (expenses), for example, feed cost in animal husbandry, and demand fluctuation were excluded from the analysis.
- This analysis was conducted within the scope of the data and information available. However, the data used involved some uncertainty. In addition, the analysis was conducted after setting several assumptions, given a variety of complicated impact channels.
- Consequently, the Bank recognizes that the analysis is all that is available at this time, and the Bank will need to not only elaborate on and secure more input information but also improve the current analytic models.
- This analysis addressed only the impact on producers' revenue. In analyzing the impact on its finances, the Bank will need to specify highly probable ones from among a variety of complicated impact channels. The Bank recognizes that these efforts will require further discussions to establish new analysis models.

Initiatives to Enhance the Transition Risk Scenario Analysis and Disclosures based on the TCFD Recommendations

We began transition risk scenario analysis in the chemical sector, which we newly determined to be highly vulnerable to the impact of transition risk, in addition to the previous electric utilities, oil-gas-coal, food and agriculture and beverages sectors.

In addition, assuming carbon neutrality at around 2050, we began analysis utilizing the Net Zero 2050 scenario (1.5°C scenario), provided by the Network for Greening the Financial System (NGFS), besides the 2°C scenario announced by the International Energy Agency (IEA) and the Food and Agriculture Organization (FAO).

Meanwhile, the TCFD revised the Annex for TCFD's Final Report and released the new Guidance on Metrics, Targets and Transition Plans in October 2021. We will enhance our TCFD disclosure from fiscal 2023 adopting these changes.

By undertaking these measures, we intend to address more sophisticated analysis and enhanced TCFD disclosures.

Moreover, we will continue to work on client engagement (constructive dialogue) on climate-related issues by leveraging scenario analysis results especially for supporting their transition to a low-carbon society.

		FY2021	FY2022
Transition risk	Target sector	Energy (electric utilities, oil-gas-coal), food and agriculture, beverages	Energy (electric utilities, oil-gas-coal), chemical, food and agriculture, beverages
	Scenario	IEA, FAO 2°C scenario, 4°C scenario	IEA, FAO 2°C scenario, 4°C scenario NGFS 1.5°C scenario
Physical risk	Target sector	Acute risk: Analysis of flood damage Chronic risk: Analysis of the impact of temperature rise and precipitation variations on the agricultural sector (rice cultivation, animal husbandry)	
	Scenario	IPCC 2°C scenario, 4°C scenario	

Note: The underlined portions represent the areas where we are currently reinforcing our own efforts.

Managing Climate-Related Risks

We adopted and implemented an environmental and social risk management (ESRM) framework centered on investment and financing sector policy. This framework helps us manage environmental and social risks, including climate-related risks, in investment and financing.

In 2019, we established the Environmental Policy and the Human Rights Policy as basic policies to solve environmental and social issues.

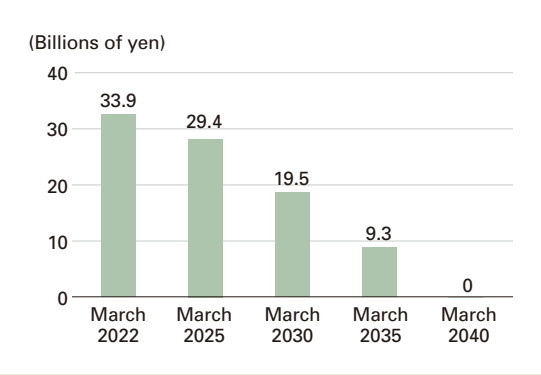
In addition, as part of our investment and financing sector policy, we established environmental and social policies for investment and financing in sectors with considerable concern of negative environmental and social impacts. These sectors include coal-fired thermal power generation, coal mining, palm oil, forestry and oil/gas.

We conduct due diligence on large-scale development projects based on the Equator Principles.

→ Initiatives to Manage Environmental and Social Risks P.38

Finance Balance for the Coal-Fired Thermal Power Plant Project (future prospects)

The Bank does not conduct any investment and/or finance for new coal-fired thermal power plants, in principle, except for cases to cope with emergency situations such as disasters, in accordance with the Policy on Environmental and Social Considerations in Financing and Investment Activities. The Bank aims to achieve a zero balance until around 2040 regarding financing for coal-fired thermal power plant projects.

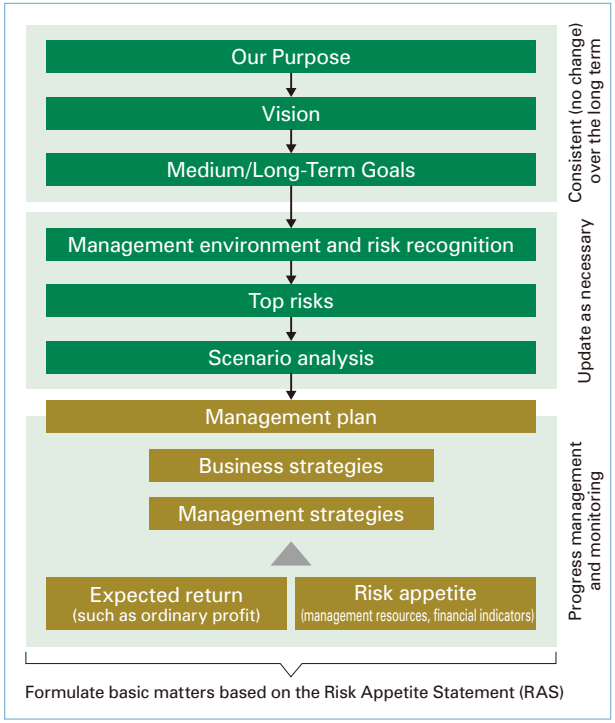


Note: Except for cases to cope with emergency situations such as disasters.

● Risk Appetite Framework (RAF) Overview

The Bank's RAF is a "framework for business administration leading to disciplined risk taking and optimizing the balance between risk and return" by clarifying the Bank's management strategies, business strategies and expected return (types and amounts of return that are set as goals), and risk appetite (types and amounts of risks that the Bank is willing to take or the Bank finds acceptable, and optimal management resources and managing them in an integrated manner. Under the RAF, with the aim of an optimal balance between risk and return, the Bank intends to further improve its soundness while adjusting to changes in the surrounding environment.

Outline of the RAF



● Reflecting on the Top Risks

The Bank issues its Risk Appetite Statement, in which it formulates and documents the basic matters related to implementation of the RAF. To formulate a management plan, based on the Risk Appetite Statement, the Bank identifies the "Top Risks" (risk events to which the Bank needs to pay special attention in the future), considering the management environment and risk recognition, and analyzes scenarios of risk events that could happen in the future. Based on the analysis results, the Bank clarifies the expected return from the implementation of the management strategies and business strategies as well as the risk appetite and formulates the management plan.

The Bank has selected a Rapid changes in the circumstances surrounding sustainability management" as one of its top risks. We recognize that rapid environmental change associated with diverse sustainability themes, such as climate change and biodiversity, is a material risk that could have an enormous impact on the sustainability of the Bank. The material risks include portfolios of increased stranded assets and adverse effects on the AFF industries caused by wind or flood damage. We aim to improve our risk management framework for respective risks by streamlining our internal perspective of risk recognition to identify the top risks. In addition, we will endeavor to practice steadily our unique sustainability perspective by considering our Purpose and Medium/Long-Term Goals while better understanding general trends in the world through discussions among management.

Metrics and Targets Related to Climate Change

● Formulation of the Medium/Long-Term Goals

We have set the Medium/Long-Term Goals FY2030 as follows: "Reduce GHG emissions by the Bank itself by 50% by fiscal 2030 (vs. fiscal 2013)," "Reduce GHG emissions of the Bank's investees and borrowers by 50% by fiscal 2030 (vs. fiscal 2013)" and "Execute new sustainable finance of ¥10 trillion by fiscal 2030." The Bank is steadily working to promote these initiatives.

→Progress of Initiatives Toward the Medium/Long-Term Goals FY2030→P. 29

Reduce GHG Emissions by the Bank Itself

The Bank monitors the GHG emissions at its domestic sites with the aim of further reducing its environmental burden. The reduction of GHG emissions has been steadily achieved with measures such as upgrading system equipment and energy-saving efforts at the respective sites.

	As of March 31, 2014	As of March 31, 2021
Scope 1	2,200 tCO_2	1,256 tCO_2
Scope 2	30,200 tCO_2	19,057 tCO_2
Total	32,400 tCO_2	Reduction of 37% 20,313 tCO_2

Carbon-related assets (as of March 31, 2022)*

Sector	Share of the total portfolio amount
Energy	¥391.0 billion (1.7%)
Utilities	¥552.5 billion (2.4%)
Total	¥943.6 billion (4.1%)

Financed amount: ¥22.9 trillion (as of March 31, 2022)

*Financed assets, excluding the financed assets for renewable power generation, etc., from the financed assets that belong to the energy and utilities sectors based on the TCFD recommendations, are defined as carbon-related assets.