Practical guide for Scenario Analysis in line with the TCFD recommendations 2021

Ministry of the Environment, Government of Japan
Climate Change Policy Division
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[Structure and Use of this Practical Guide]

Composed of “The TCFD recommendations”, “Key points for scenario analysis”, “Practice cases by sector”, and “Appendix”

Corporate Needs	Chapters and the Practical Guide and Their Summaries
Companies want to know what the TCFD recommendations are and what scenario analysis is in terms of the TCFD recommendations in the first place.	**CHAPTER 1. Introduction** This chapter explains the purpose of this practical guide, outlines the TCFD recommendations and significance in the background, and positions of scenario analysis.
Companies want to know the specific promotion means and practical points for scenario analysis.	**CHAPTER 2. Scenario Analysis - Key Points of Practice** This chapter explains how to practically undertake scenario analysis and describes key points of its practice, based on use cases performed by companies under the support program of the Ministry of the Environment.
Companies want to know the actual scenario analysis conducted by Japanese companies for each step in the analysis.	**CHAPTER 3. Scenario Analysis - Practice Cases by sector** This chapter explains how scenario analysis is carried out based on the support cases of the Ministry of the Environment (13 companies supported in FY2020 and FY2021).
Companies want to know the reference tools and literature for scenario analysis.	**Appendix.** Provide useful materials for scenario analysis based on the support cases.

- TCFD's approach for scenario analysis in this Practical Guide has been developed based on a technical supplement to scenario analysis ("TCFD Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities" (2017.6)) as well as its own methodology and interpretations.
- Figures for each case are based on information at the time of acquisition.
- Examples of projects supported by the Ministry of the Environment are examples of projects supported by the “Project to Analyze Scenarios of Climate Risks and Opportunities in Accordance with TCFD” implemented in FY2018, FY2019, FY2020 and FY2021.

1. Introduction

1-1. Purpose of this Practical Guide

1-2. Significance of the TCFD recommendations / positioning of scenario analysis

Chapter 1. Introduction

This chapter explains the purpose of Practical Guide, concept and significance of the TCFD recommendations, and positioning of scenario analysis.

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[Challenges for companies in implementing scenario analysis]

Respond to the challenges of scenario analysis with "Practical Points" and "Practice Cases by Sector"

What is scenario analysis?

- ✓ The TCFD recommendations call for climate-related disclosure in line with the framework including Governance, Strategy, Risk Management, and Metrics and Targets. Of the 11 total recommended disclosure items, "Implementing scenario analysis" is recommended in item "c" of "Strategy".
- ✓ This Guide has been compiled by the Ministry of the Environment based on the results of corporate support from FY2018. Its methods for implementing scenario analysis are based on the TCFD's technical supplement ("The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities")

- There are roughly 6 difficulties that companies face in implementing scenario analysis.
  (1) Scenario analysis is roughly understood, but **no specific implementation process is known**.
  (2) **The processes and departments** involved in scenario analysis differ for each company and product, and the level of implementation of scenario analysis cannot be determined uniformly.
  (3) **Efforts are required to ensure that internal management understands** the purpose and the results of scenario analysis.
  (4) The method for calculating business impact is unknown, and **utilizable external data for scenario analysis is lacking**.
  (5) The **direction for increasing the sophistication** of scenario analysis is unknown (includes implementing 1.5℃ scenarios and considering transitions).
  (6) The **direction for disclosing** scenario analysis results is unknown (Securities reports, Integrated reports, Corporate Governance Code, etc.).

- The above issues can be resolved in this Practical Guide.
  - ✓ (1), (2): Understanding of **"Chapter 2 Key Points of Practice"** and **"Chapter 3 Practice Cases by Sector"** in this Practical Guide.
  - ✓ (3): Have management understand the significance of the TCFD recommendations and scenario analysis through **"Chapter 1 Significance of the TCFD recommendations / positioning of scenario analysis"** in this Practical Guide.
  - ✓ (4): Then, conduct scenario analysis by utilizing the implementation procedures and calculation methods described in **"Chapter 2 Key Points of Practice"** and **"Chapter 3 Practice Cases by Sector"** in this Practical Guide. Start a dialogue with management with the results of the analysis. If necessary, describe **the external data** in **Appendix**.
  - ✓ (5): Understand and practice the direction to take for making scenario analysis more sophisticated (example: after the second year) through **"Chapter 2 Key Points of Practice"** in this Practical Guide. Also give thought to implementing 1.5℃ scenarios and considering transitions.
  - ✓ (6): Refer to the latest disclosure case studies for preparing Securities reports, Integrated reports, and Corporate Governance reports from the **best practice case studies** in this Practical Guide's **"Appendix"**.

- The key is to begin scenario analysis with what you understand, and progress and deepen your knowledge and experience.
  - ✓ Example: First, conduct qualitative scenario analysis. Then, try quantitative scenario analysis.
  - ✓ Example: First, apply scenario analysis to a certain segment. Then, apply to a greater part of your company.

- The goal of scenario analysis is to "respond to climate-related issues" and to "increase corporate value" at the same time.
  - ✓ It is important not only to conduct scenario analysis, but also to continue the "cycle" which is to disclose information and hold dialogues with management.
  - ✓ Seize opportunities by continuing the cycle and incorporate it into business plans.

1. Introduction

1-1. Purpose of this Practical Guide

1-2. Significance of the TCFD recommendations / positioning of scenario analysis

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[Background of the TCFD]

The Financial Stability Board established the Task Force on Climate-related Financial Disclosures (TCFD) at the G20's request due to concerns that climate change could undermine the stability of the financial system and threaten financial institutions

- "The financial risks that could result from the process of adjustment towards a lower carbon economy could prompt a reassessment of the value of a large range of assets with a large volume of greenhouse gas emissions and destabilize the financial system." Speech made by Mark Carney, Chair of the Financial Stability Board (FSB), Then Governor of the Bank of England
- Dr. Carney also refers to the possibility that a sudden reassessment could destabilize markets like the subprime loan crises.

Speech by Mark Carney, Chair of the Financial Stability Board (FSB),Then Governor of the Bank of England (September 2015)

There are three broad channels through which climate change **can affect financial stability**:

- **Physical risks**: The direct impacts on property from climate related events, such as floods and storms and indirect impacts on blocked global supply chain or depletion of resources;
- **Liability risks**: The impacts that could arise if parties who have suffered loss or damage from the effects of climate change seek compensation from those they hold responsible;
- **Transition risks**: The risks which could result from **reassessment of the value of a large range of assets with a large volume of greenhouse gas emissions during the process of adjustment towards a lower carbon economy**.

Source: Financial Times Online, September 30, 2015

[Positioning of the TCFD Recommendations in Information Disclosure]

TCFD is a task force for examining climate-related information disclosures and responses by financial institutions; the TCFD recommendations are recognized as the standard for each framework and evaluation

Alignment of framework with the TCFD recommendations

Alignment of evaluation methods/items with the TCFD recommendations

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Global participants: 3,075 groups
729 of which are Japanese
(as of February 2022)

Disclosure framework

CDP	**Revised its questionnaire to include the TCFD recommendations** as of 2018
IIRC[*1]	Reported that its existing framework and standards were found to be **mostly in line with the TCFD recommendations** according to the results of surveys toward the CDP, GRI, SASB, CDSB and similar
ISSB[*2]	Released the prototype for climate-related disclosures **in compliance with the TCFD recommendations** in November 2021 Completed version to be released in June 2022
⋮	

Evaluation organizations

FTSE Russell	Added and updated metrics to be **consistent with climate change metrics in the TCFD recommendations**
MSCI	Began **aligning its evaluation of climate-related risks/opportunities with the TCFD** for certain portions of its climate change risk analysis
DJSI	**Revised questions in some sectors to be in line with the TCFD recommendations**
⋮	

*1: IIRC merged with SASB to form VRF (Value Reporting Foundation), which works to build a comprehensive and consistent corporate reporting framework through the IIRC's Integrated Reporting Framework and the SASB Standards

*2: CDSB and VRF will merge with the ISSB by June 2022. The IFRS Foundation, which oversees the IASB and ISSB, will be responsible for international rules for accounting standards and sustainability standards (IFRS Website IFRS - International Sustainability Standards Board)

Sources: TCFD Guidance2.0, FTSE Russell "How the TCFD recommendations are incorporated into FTSE Russell's ESG Ratings and data model"
MSCI Website https://www.msci.com/our-solutions/esg-investing/climate-solutions/climate-risk-reporting

1-5

[The TCFD recommendations]

The TCFD recommendations require all companies to disclose information on climate-related risks and opportunities; unlike existing frameworks, they are unique in that they recommend conducting scenario analysis

Recommended disclosures	Governance	Strategy	Risk Management	Metrics and Targets
Areas in detail	Disclose the organization's governance around climate-related risks and opportunities	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material	Disclose how the organization identifies, assesses, and manages climate-related risks	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material
Recommended Disclosures	a) Describe the board's oversight of climate-related risks and opportunities	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	a) Describe the organization's processes for identifying and assessing climate-related risks	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process
	b) Describe management's role in assessing and managing climate-related risks and opportunities	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	b) Describe the organization's processes for managing climate-related risks	b) Disclose Scope 1, Scope 2, and if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks
		c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management	c) Describe the targets used by the organization to manage climate-related risks and opportunities, and performance against targets

(Differences with the existing information disclosure system)

■ Implementation of scenario analysis:
Recommends disclosure of information using **specific climate-related scenario analysis** as recommended by the TCFD

Source: prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.14

1-6

[Trends toward Decarbonization]

As countries and institutional investors declare decarbonization targets such as carbon neutrality by 2050, companies are also being called on to implement decarbonized business practices

China's President Xi Jinping declares target of net zero GHG emissions by 2060 at UN General Assembly

South Korea's President Moon Jae-in declares target of net zero GHG emissions by 2050

U.S. President Biden declares targets for net zero by 2050 and a 50 – 52% reduction of GHG emissions compared to 2005 levels by 2030

June. 8, 2020 | Sept. 11 | Oct. 26 | Oct. 28 | Nov. | April. 22, 2021

Challenge Zero

ZERO EMISSIONS CHALLENGE

Keidanren (the Japanese Business Federation) encourages companies and organizations to take on the challenge of creating a "decarbonized society"

Former Prime Minister Suga declares target of net zero GHG emissions by 2050

Former Prime Minister Suga declares target of a 46% reduction of GHG emissions compared to FY2013 levels by 2030

Sources: Websites for various countries and organizations, news websites such as NHK, Reuters, and AFP news

[Revision of Corporate Governance Code]

In Japan, the revised Corporate Governance Code requires disclosure based on the TCFD recommendations for prime market listed companies

- The **Corporate Governance Code and guidelines for dialogue between investors and companies were revised** to enable companies to demonstrate more sophisticated governance (June 2021)
- **Prime market listed companies will be required to submit an annual "Corporate Governance Report" every year starting in 2022 (for 2022, submission by June is desirable)**[*1]

Details of TCFD-related revisions[*2]

コーポレートガバナンス・コードと
投資家と企業の対話ガイドラインの改訂について

スチュワードシップ・コード及びコーポレートガバナンス・コードのフォローアップ会議
2021年4月6日

- It is important for listed companies to consider and promote sustainability initiatives on a company-wide basis (e.g., **establishing committees on sustainability**, holding dialogue with shareholders)

コーポレートガバナンス・コード
～会社の持続的な成長と中長期的な企業価値の向上のために～

JPX
TOKYO STOCK EXCHANGE

2021年6月11日
株式会社東京証券取引所

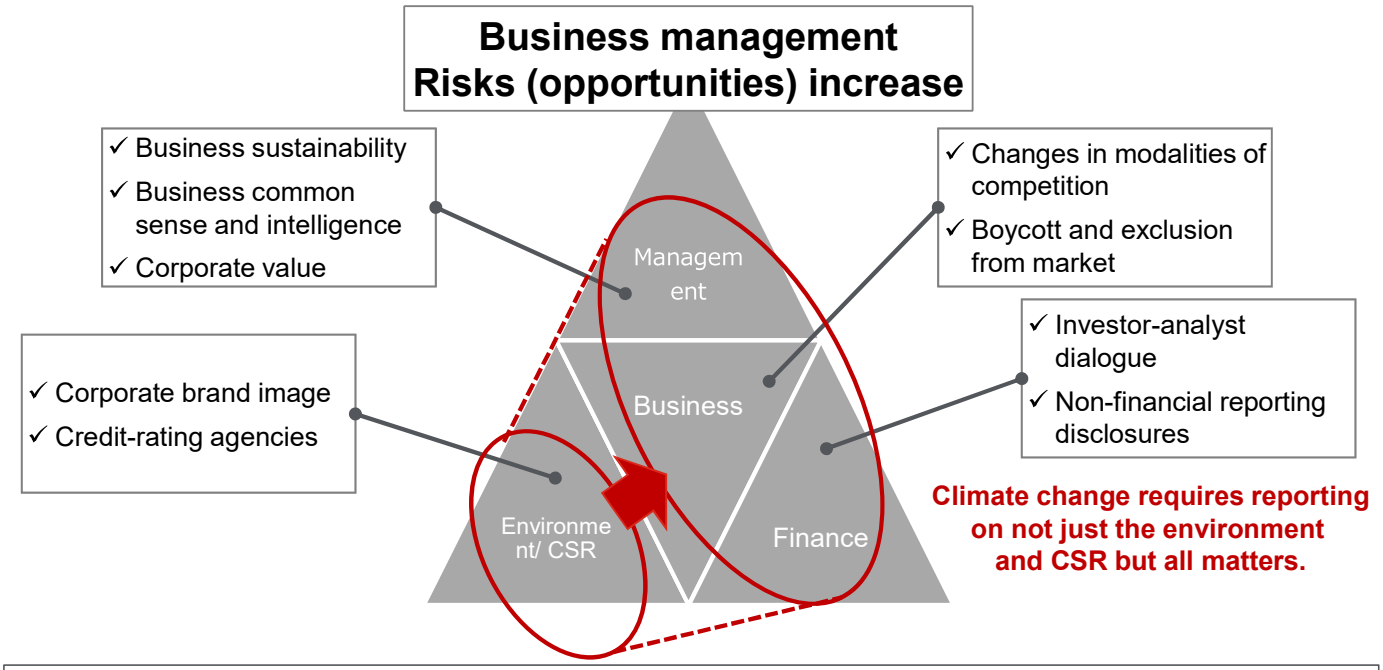
- When disclosing management strategies, **listed companies should make appropriate disclosure of their efforts related to sustainability**
- **Prime market listed companies**[*2] should promote the **quality and quantity of their disclosures based on the TCFD recommendations**
- **The Board of Directors** should **formulate basic policies on the company's sustainability initiatives and provide effective oversight**

*1: The revisions in the Corporate Governance Code that cover prime market listed companies will come into effect on April 4, 2022. Reports based on the principles, etc., for prime market listed companies are required to be submitted starting April 4, 2022; the Corporate Governance Reporting Guidelines (April 2022 version) will be effective starting April 4, 2022

*2: One of the market classifications after the Tokyo Stock Exchange listing classification change (scheduled for April 4, 2022). Generally equivalent to the current First Section of the Tokyo Stock Exchange

[Corporate Management and Climate Change]

For corporate management, climate change has the potential to become a clear risk and opportunity for the company as a whole



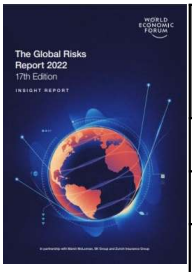
The environment and CSR department has responded to the climate change, however, there is a growing need for a company to respond to the issues as a whole, as climate-related issues can be risks and opportunities in the field of "corporate value", "business sales", and "fund raising."

[Management and Climate Change Risks (1)]

Environmental risks related to climate change are also being focused on by management around the world; environmental risks are mentioned for all short, medium and long-term time frames, and there is a concern that serious environmental risks will increase with longer time frames

Top 10 risks in the World Economic Forum (WEF) "Global Risks Report 2022"

■ :Environmental risks



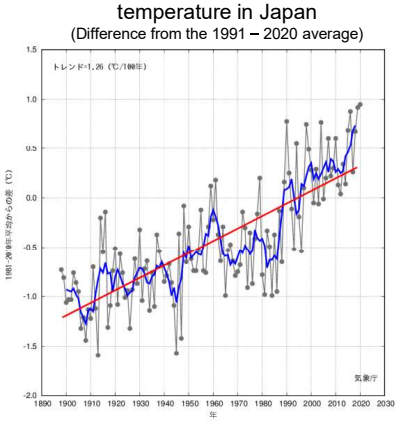
	By time frame			By severity
	Short term (0-2years)	Medium term (2-5years)	Long term (5-10years)	10 year on-wards
1	Extreme weather	Climate action failure	Climate action failure	Climate action failure
2	Livelihood crises	Extreme weather	Extreme weather	Extreme weather
3	Climate action failure	Social cohesion erosion	Biodiversity loss	Biodiversity loss
4	Social cohesion erosion	Livelihood crises	Natural resource crises	Social cohesion erosion
5	Infectious diseases	Debt crises	Human environmental damage	Livelihood crises
6	Mental health deterioration	Human environmental damage	Social cohesion erosion	Infectious diseases
7	Cybersecurity failure	Geoeconomic confrontation	Involuntary migration	Human environmental damage
8	Debt crises	Cybersecurity failure	Adverse tech advances	Natural resource crises
9	Digital inequality	Biodiversity loss	Geoeconomic confrontation	Debt crises
10	Asset bubble burst	Asset bubble burst	Geopolitical resource contestation	Geoeconomic confrontation

Source: World Economic Forum "Global Risks Report 2022" https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2022.pdf

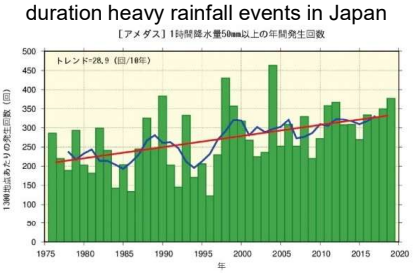
[Management and Climate Change Risks (2)]
In Japan, too, rising average temperatures and more frequent heavy rains are predicted, and physical risks from climate change will affect the sustainable management of companies in time frames spanning from short- to medium- and long-term

- The global average temperature for 2011 – 2020 is already about 1.1ºC higher than the pre-industrial (1850 – 1900) average. If this trend continues, **global warming will exceed 1.5ºC and 2ºC within the 21st century unless emissions of carbon dioxide and other greenhouse gases are significantly reduced in the coming decades**. (IPCC: the Sixth Assessment Report [the Working Group 1] "AR6 Climate Change 2021: The Physical Science Basis")
- Global warming is expected to cause increased risk of heat stroke, rising sea levels, and **increased frequency/severity of extreme weather events** such as heavy rains, typhoons, and heatwaves. This will **affect the viability of corporate activities** through supply chain disruptions, damage to facilities, and employee health risks.

Changes in annual average temperature in Japan
(Difference from the 1991 – 2020 average)



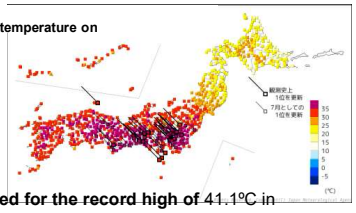
Changes in the number of annual short-duration heavy rainfall events in Japan



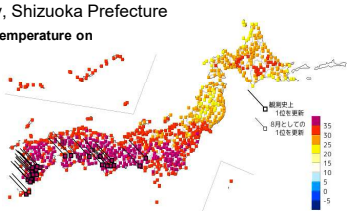
→Clear trend for increased number of short-duration heavy rainfall events observed

Observation of high temperatures across Japan

July 2018
Highest temperature ever recorded at 41.1ºC in Kumagaya City, Saitama Prefecture
Record number of emergency transports due to heatstroke from July 16 – 22
Maximum daytime temperature on July 23, 2018
(Source: Japan Meteorological Agency)

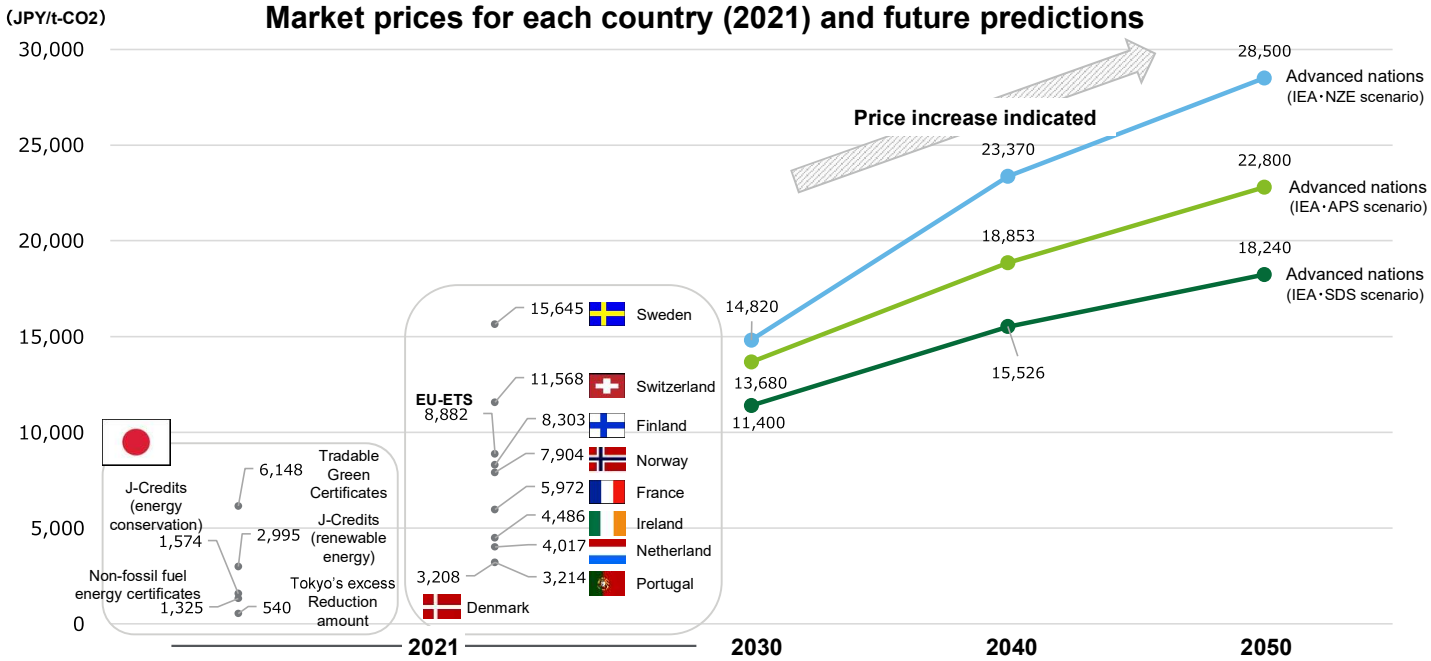


August 2020
Temperature tied for the record high of 41.1ºC in Hamamatsu City, Shizuoka Prefecture
Maximum daytime temperature on August 17, 2020
(Source: Japan Meteorological Agency)



Source: Japan Meteorological Agency, Climate Change Monitoring Report 2019 (Japan Meteorological Agency)

[Climate Change Risks/Opportunities: Projected Changes in Carbon Pricing]
Carbon pricing, which is being introduced in many countries in the transition to a low-carbon economy, will rise to between 10,000 JPY and 30,000 JPY; price increases are expected to occur worldwide in the future, which could be both risk and opportunity

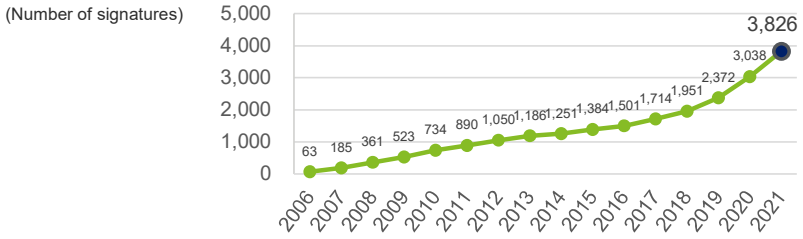


※ 1 USD＝114 JPY,1 EUR＝129 JPY(as of January 31, 2022)
※ EU-ETS prices as of March 1, 2022 are used; World Bank carbon prices for each country are used as of April 2021.
※ Tradable Green Certificates have been temporarily determined as 3 JPY/kWh
※ For the CO2 emission factor for electricity, we used the substitute values "0.00047(t-CO2/kWh)" (https://ghg-santeikohyo.env.go.jp/calc) from "Emission factors by electric utility (for calculating greenhouse gas emissions of specific emitters) – FY2019 results – published January 7, 2021, by the Ministry of the Environment and the Ministry of Economy, Trade and Industry
Source: Non-fossil fuel energy certificates: Agency for Natural Resources and Energy website: (https://www.enecho.meti.go.jp/category/electricity_and_gas/electric/nonfossil/katsuyou_joukyou/), J-Credits system "average bid price" (https://japancredit.go.jp/tender/), Tokyo's excess reduction amount: Tokyo Metropolitan Government – Bureau of Environment website: (http://www.kankyo.metro.tokyo.jp/climate/large_scale/trade/), EU-ETS (https://tradingeconomics.com/commodity/carbon), IEA "World Energy Outlook 2021", https://www.iea.org/reports/world-energy-outlook-2021 , Price Rate1 (highest price) from World Bank "Carbon Pricing Dashboard" (https://carbonpricingdashboard.worldbank.org/)

[Increased Decarbonization Awareness in Investors (1)]
ESG investments continue to increase, with investments reaching 121 trillion USD globally, and 514 trillion JPY in Japan

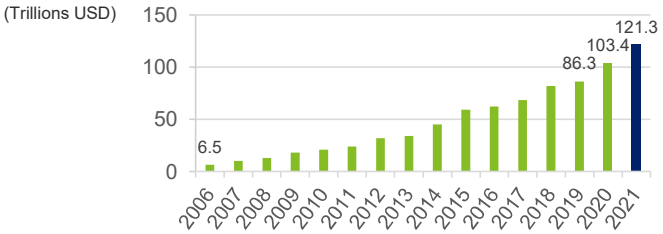
Number of PRI signatures (globally)

- The number of PRI signatures as of 2021 was 3,826



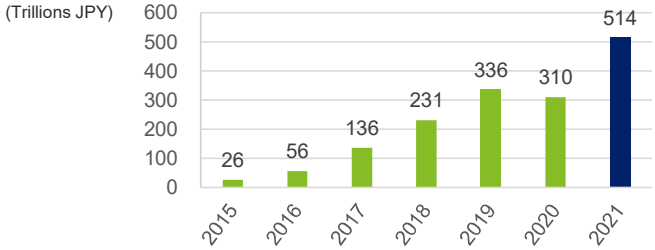
ESG assets under management (globally)

- As of 2021, the total amount of AUM was approximately 121 trillion USD



ESG assets under management (Japan)

- As of late March 2021, the total amount of AUM was approximately 514 trillion JPY



Source: PRI HP https://www.unpri.org/pri/about-the-pri, https://www.unpri.org/pri/about-the-pri, JSIF (Japan Sustainable Investment Forum) website https://japansif.com/survey#toc5

[Increased Decarbonization Awareness in Investors (2)]
Movement from institutional investors toward setting decarbonization targets can be seen, and there are also signs that companies will be asked to commit not only to high target levels, but also to speedy and effective strategies

Investor setting of decarbonization targets

- Nippon Life Insurance Company aims for zero CO2 emissions for companies it invests in by 2050
  - **The company is planning to** encourage efforts to reduce CO2 emissions **by companies in its investment portfolio for corporate bonds and equity, and consider divesting if no such efforts are made** (January 1, 2021)

- Increasing numbers of Japanese financial institutions declare their intent to participate in international climate change-related investor initiatives
  - In relation to the 1.5ºC target adopted at COP26, Nippon Life Insurance Company, Meiji Yasuda Life Insurance Company, Sumitomo Life Insurance Company declared participation in the "AoA (Net-Zero Asset Owner Alliance), Nomura Asset Management joined NZAMI (Net Zero Asset Managers Initiative), and Mizuho Financial Group joined "NZBA (Net-Zero Banking Alliance)" (November 2021)

- 43 Net-Zero Asset Managers member institutions set interim targets
  - "NZAMI", which has committed to making its investment portfolio carbon neutral by 2050, announced in a progress report that **43 member institutions have set interim targets**. The assets under management of the 43 institutions total 4.2 trillion USD, accounting for 35% of the 11.9 trillion USD for total assets under management for the 220 member institutions (November 2021)

Investor engagement with companies

- The Hague, Netherlands, orders Shell to reduce CO2 emissions
  - A lawsuit filed by several environmental protection groups cited that the biggest European oil company Royal Dutch Shell (UK, Netherlands) lacked specificity, binding effect, and speed, and **demanded that the company reduce its emissions, including Scope 3 emissions, by 45% of its 2019 net emissions by 2030** (May 2021)

- The New York State Department of Financial Services (DFS) encourages information disclosure by in-state insurance companies
  - The finalized guidance was released on climate change financial risk management for state-based insurance companies, **urging disclosure based on the TCFD recommendations** (November 2021)

- Major institutional investors demand emission reduction targets be set
  - Larry Fink, CEO of BlackRock of the U.S., the world's largest asset management firms, released a letter to top executives of the companies BlackRock invests in, **requesting that they set short, medium, and long-term GHG emission reduction targets and perform information disclosure in compliance with the TCFD recommendations** (January 2022)

Sources: Sustainable Japan https://sustainablejapan.jp/2021/11/22/new-york-tcfd-guidance/68309, https://sustainablejapan.jp/2021/11/16/net-zero-asset-managers-4/68122, NHK news, https://www.nikkei.com/article/DGXZQODF228IG0S1A120C2000000, BlackRock website https://www.blackrock.com/jp/individual/ja/2022-larry-fink-ceo-letter, New York State https://www.dfs.ny.gov/industry_guidance/climate_change, Alterna https://www.alterna.co.jp/42842/, various public information such as the Nikkei

[Case Study for Disclosure in Securities Reports]

There was progress in the disclosure of scenario analysis in securities reports in 2021; scenario disclosure is also attracting investors' attention as a medium for disclosure from the perspective of deepening the relationship between climate change-related information and financial information

Case study for disclosure in securities reports (Example by Tokyu Fudosan Holdings)

- 1.5°C scenario disclosures
  - List the transition/physical risks for three types of scenarios: 1.5°C (the Paris Agreement achieved), 3°C (NDC complied with by each country), 4°C (reduction measures failed)
- Disclosure of business impact evaluation
  - For financial impact, use plus/minus arrows to show impact

想定される環境変化	1.5℃シナリオ（パリ協定の実現） 政策強化・法令等規制が厳格化	3℃シナリオ（各国がNDCを遵守） 1.5℃と4℃の中間的なシナリオ	4℃シナリオ（削減策が破綻） 自然災害が激甚化
移行リスク（一部抜粋）	2030年 2050年	2030年 2050年	
	↓ 炭素税の導入・上昇 ↓	↓ 炭素税の導入・上昇 ↓	
	↑↓ ZEB化による競争優位性 ZEB化対応コストの増大 ↑↓	↑↓ ZEB化による競争優位性 ZEB化対応コストの増大 ↑↓	
	↑ 再エネ事業の拡大 ↑	↑ 再エネ事業の拡大 ↑	
物理的リスク（一部抜粋）	2030年 2050年	2030年 2050年	2030年 2050年
	↑↓ BCP対応による競争優位性 自然災害による施設の損害 ↑↓	↑↓ BCP対応による競争優位性 自然災害による施設の損害 ↑↓	↑↓ BCP対応による競争優位性 風水災による施設の損害 ↑↓
	↑↓ 既存アセットによる新規事業 気温上昇による減収・コスト増 ↑↓	↑↓ 既存アセットによる新規事業 気温上昇による減収・コスト増 ↑↓	↑↓ 立地による競争優位性 気温上昇による減収・コスト増 ↑↓

↑ 財務影響プラス
↓ 財務影響マイナス

1-15 Source: Tokyu Fudosan Holdings "Securities Report", EDINET (edinet-fsa.go.jp)

Repeat of earlier page

[Positioning of the TCFD recommendations in information disclosure]

The TCFD recommendations have become recognized as the standard for each framework/evaluation as disclosure frameworks / evaluation organizations have revised and reconsidered their metrics and criteria, etc. to align with the TCFD recommendations

Alignment of framework with the TCFD recommendations

Alignment of evaluation methods/items with the TCFD recommendations

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Global participants:3,075 groups
729 of which are Japanese
(as of February 2022)

Disclosure framework

CDP	**Revised its questionnaire to include the TCFD recommendations** as of 2018
IIRC*1	Reported that its existing framework and standards were found to be **mostly in line with the TCFD recommendations** according to the results of surveys toward the CDP, GRI, SASB, CDSB and similar
ISSB*2	Released the prototype for climate-related disclosures **in compliance with the TCFD recommendations** in November 2021 Completed version to be released in June 2022
⋮	

Evaluation organizations

FTSE Russell	Added and updated metrics to be **consistent with climate change metrics in the TCFD recommendations**
MSCI	Began **aligning its evaluation of climate-related risks/opportunities with the TCFD** for certain portions of its climate change risk analysis
DJSI	**Revised questions in some sectors to be in line with the TCFD recommendations**
⋮	

*1: IIRC merged with SASB to form VRF (Value Reporting Foundation), which works to build a comprehensive and consistent corporate reporting framework through the IIRC's Integrated Reporting Framework and the SASB Standards

*2: CDSB and VRF will merge with the ISSB by June 2022. The IFRS Foundation, which oversees the IASB and ISSB, will be responsible for international rules for accounting standards and sustainability standards (IFRS Website IFRS - International Sustainability Standards Board)

Sources: TCFD Guidance 2.0, FTSE Russell "How the TCFD recommendations are incorporated into FTSE Russell's ESG Ratings and data model"

1-16 MSCI Website https://www.msci.com/our-solutions/esg-investing/climate-solutions/climate-risk-reporting

[Relationship between CDP Questions and the TCFD Recommendations]
The CDP questions also conform to the TCFD recommendations; addressing the TCFD recommendations will lead to enhanced corporate value

- The CDP sends out questionnaires **at the request of institutional investors and companies that make ESG investments, and evaluates companies' environmental responses**
- The climate change questionnaire **conforms to the recommended disclosure items in the TCFD recommendations**, and asks for information on companies' risks, opportunities, and impact related to climate change

The CDP's climate change questionnaire (2022)**: there are questions related to the TCFD recommendations in C3.2, etc.**

C3 Business strategy

Business strategy

(C3.1) Does your organization's strategy include a transition plan that aligns with a 1.5°C world?

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's transition to a 1.5°C world?

(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization's transition to a 1.5°C world.

Source: CDP website

[Relationship between the ISSB and the TCFD Recommendations]
The ISSB has been organized to develop internationally consistent standards for sustainability disclosure, and companies will need to keep a close watch on its actions; for climate-related disclosures, it calls for information disclosures based on the TCFD recommendations

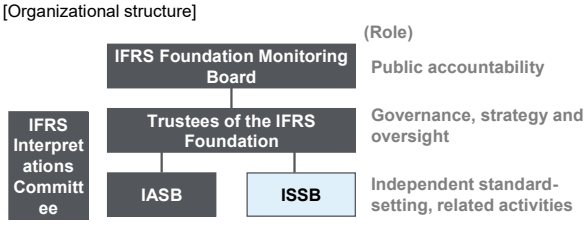
- The IFRS Foundation established the ISSB on November 3, 2021, in response to the needs of investors, etc., to develop international disclosure standards
- The TRWG released the climate-related disclosure standards prototype in November 2021, which **requests disclosures made based on the TCFD recommendations**. The final version is scheduled for release by around June 2022

History and goal of the ISSB

✓ Founding history: On November 3, 2021, the Trustees of the IFRS Foundation **announced the founding of the ISSB (International Sustainability Standards Board)** at COP26

✓ Goal: **Aim to develop international standards for ESG information disclosure such as climate change risks** in order to improve consistency and comparability of corporate sustainability disclosures

[Organizational structure]



Relationship between the ISSB and the TCFD recommendations

✓ The TRWG*1 is a working group for consideration of ISSB standards; in November 2021, it released a summary document of the deliverables that will become the foundation of future consideration (8 deliverables)

✓ Of the deliverables released, two were disclosure standard prototypes

- General Requirements for Disclosure of Sustainability-related Financial Information (General Requirements Prototype) (Deliverable 1)
- **Climate-related Disclosures Prototype** (Deliverable 2)

Establishes corporate disclosure requirements for climate-related financial information, and **requires disclosure of information on governance, strategy, risk management, metrics and targets based on the TCFD recommendations**

*1: The TRWG is composed of representatives from the CDSB, TCFD, IASB, VRF, and the world Economic Forum

Sources: IFRS Foundation website IFRS - Our structure, https://www.ifrs.org/groups/technical-readiness-working-group/#about, IFRS Foundation TRWG "Climate-related Disclosures Prototype" (November 3, 2021) Prototype Climate-related Disclosures Requirements (Climate Prototype) (ifrs.org), the Nikkei

[Impact on companies who do not implement responses to the TCFD recommendations]

Perceptions of lacking / having inadequate measures for addressing the TCFD recommendations have a great risk of hindering sustainable management of the company in the short, medium, and long-term

Short term

- **Increased financing costs**: Perceptions of inadequate measures against climate change will lead to increased financial costs due to withdrawn investments and lost opportunities for ESG investment and green financing
- **Environmental reputation/branding**: Decline in environmental reputation and branding due to lack of compliance with international disclosure rules
- **Lawsuits**: Litigation by shareholders and other stakeholders for failure to uphold obligations for reporting material information (example: Commonwealth Bank of Australia)

+

Short to medium-term

- **Regulations**: Failure to comply with information disclosure rules and accounting standards may lead to a decline in the company's reputation and its competitiveness, as well as incurring penalties from the government (Corporate Governance Code revision in Japan, movement toward legislation in several countries in Europe)

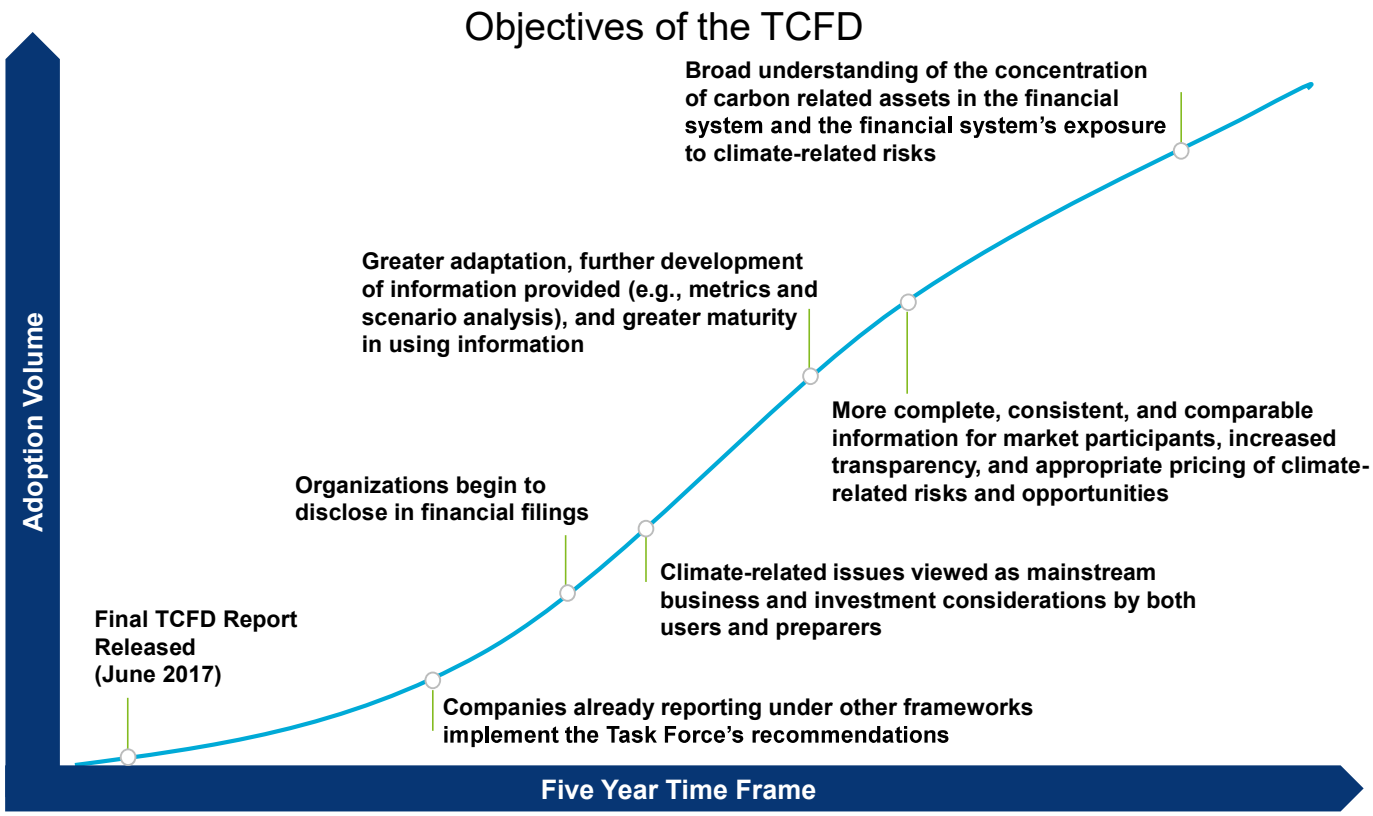
+

Long term

- **Weakening of business itself**: If the company fails to cope with the uncertainties of climate change, it will lose opportunities / be exposed to risks that may jeopardize its long-term survival

[Objectives of the TCFD]

The TCFD expects companies to gradually adopt the recommendations, and aims for broad understanding over 5 years by 2022



Source: Task Force on Climate-related Financial Disclosures, 2017

[Status of the TCFD recommendations in Each Country (1/2)]
Progress toward making the TCFD recommendations into policy continues; the UK plans to be the first country worldwide to implement mandatory disclosure based on TCFD recommendations

EU

EU revised its directive to comply with the TCFD recommendations

- Published a draft revision in March 2019 toward the "revision of guidelines for non-financial reporting directive" (March '19)
- On June 20, 2019, the draft revision of the guidelines and supplementary materials was announced. TCFD compliant (June '19)
- Revised the Non-Financial Reporting Directive (NFRD), announced a new Corporate Sustainability Reporting Directive (CSRD) that extends the scope to taxonomy disclosure, and called for companies to disclose ESG-related information that has an impact on the environment and society. Plans to extend the scope of disclosures to all large corporations* and listed companies around 2023. Updates scheduled every three years based on reference to international disclosure frameworks from the GRI, SASB, TCFD, etc. (April '21)

UK

UK requests its regulators to support the TCFD recommendations

- The UK Green Finance Taskforce, established by the government to transition to a low-carbon society
- Mentioned that it will aim to have all listed companies and large asset owners perform TCFD-compliant disclosures by 2022. Invited public comments from March to October 2020 on making disclosures mandatory via "Comply or Explain" (June '20)
- The Department for Business, Energy & Industrial Strategy announced draft regulations for the Company Act requiring large corporations and designated financial institutions to implement TCFD-based information disclosure (October '21). This has already been approved by the House of Commons and the House of Lords, and after approval by the Crown, it will be applied to reports for fiscal years starting on April 6, 2022, making it the world's first mandatory implementation of the TCFD recommendations (January '22)

Canada

Compiled recommendations on sustainable financing, including the TCFD recommendations

- Expert Panel established by the Ministry of the Environment and Climate Change and the Ministry of Finance
- Publication of the Final Report on the Issues and Recommendations on Institutionalization of Sustainable Finance, etc. (June '19)
- In addition, banks and other financial institutions and CSA (Canada Standard Authority) are taking the lead in discussing a unique Canadian taxonomy (September '21).
- Prime Minister Trudeau stated in separate letters to the Ministry of Finance and the Ministry of the Environment and Climate Change that he will move to require federal regulatory agencies (financial institutions, pension funds, etc.) to disclose information in line with TCFD recommendations. There was no definite statement regarding the date of implementation (December '21)

France

Started standardizing and developing frameworks for non-financial data as a whole to disclose the TCFD recommendations

- Economic and Finance Minister consulted the Accounting Standards Authority to develop extra-financial information disclosure frameworks to disclose information based on TCFD.
- Introduced a system to establish the Advisory Committee on Climate Change and Sustainable Finance composed of financial institutions, companies, and experts (July '19)
- (Reference) Article 29 of the new Energy-Climate Law states the obligation to publish alignment with long-term biodiversity protection goals as part of the tightened regulations for Energy Article 173 (June '21)

China

Scheduled revision of Environmental Reporting Guidelines

- A pilot project was launched in collaboration with the British government. Exploring the incorporation of a TCFD framework into the Chinese Environmental Reporting Guidelines and announcing its intention to make such mandatory for all listed companies by 2020 (January 2018). In addition, ESG has been incorporated into the Governance Disclosure Guidelines (September 2018).
- The Industrial and Commercial Bank of China (ICBC) translated five documents, including the TCFD recommendations and guidance, for the adoption and implementation of TCFD frameworks in China. There are plans to translate more documents in the future. (January '22)

*: A large corporation is defined as one that meets at least two of the following three criteria: net assets of 20 million EUR, net sales of 40 million EUR, and at least 250 employees

Sources: TCFD, "2021 Status Report", Ministry of the Environment; European Union Commission website, etc

*As of the end of January 2022

[Status of the TCFD recommendations in Each Country (2/2)]
There is also movement to encourage information disclosure in the U.S. and Japan, with the TCFD recommendations being recognized as the global standard

U.S.

Securities and Exchange Commission (SEC) recommends that the U.S. use its own ESG disclosure framework

- The New York State Department of Financial Services (DFS) joined the Network for Greening the Financial System (NGFS). The NGFS will consider implementing responses to climate-related risks in areas of financial supervision, including publishing non-binding disclosure recommendations in its April 2019 integrated report such as those based on TCFD recommendations (September '19)
- The SEC issued a report recommending that the U.S. use its own ESG disclosure framework. The report recognized the usefulness of TCFD recommendations, GRI, and U.S. Sustainability Accounting Standards Board (SASB) criteria in preparing the ESG disclosure framework (May '20)
- Public commentary made on the mandatory disclosure of information related to climate change risks; 180 institutional investors, 155 global companies, and 58 NGOs issued a joint statement calling for introducing mandatory disclosure of information based on the TCFD guidelines to listed companies (June '21)
- The Division of Corporation Finance (DCF) in the U.S. Securities and Exchange Commission (SEC) focused on disclosures related to business contents, risk factors, and the MD&A section, and released sample letters showing types of comments that the DCF may issue to public companies regarding climate change-related disclosures (September '21)
- "A ROADMAP TO BUILD A CLIMATE-RESILIENT ECONOMY", released by the Biden administration, states that Securities and Exchange Commission (SEC) staff are preparing a recommendation to the SEC for regulations related to mandatory disclosures aimed at providing investors with information about the significant risks and opportunities that climate change presents for their investments, and that the draft regulations will be proposed in the next few months (December '21)

Japan

Released guidance on TCFD disclosures

- METI released TCFD Guidance*1 by adding explanation to TCFD final report in order to promote disclosure by companies based on TCFD (December '18) "TCFD Guidance" was revised by the TCFD Consortium and published as "TCFD Guidance 2.0" (July '20) and released at the TCFD Summit (October '20)
- The Ministry of the Environment announced a practical guide describing examples and methodologies to be used as a reference when companies conduct scenario analysis (March '19, March '20)
- Led by five founders including Professor Kunio Ito of Hitotsubashi University, the TCFD Consortium was established (May '19). The consortium formulated the Green Investment Guidance*2 which provides commentaries on perspectives needed by investors and other stakeholders when understanding the information disclosed based on the TCFD recommendations and released it at the TCFD Summit (October '19).
- The Financial Services Agency revised the Corporate Governance Code, which also mentions sustainability and the TCFD recommendations. It requests that prime market listed companies disclose information based on the TCFD recommendations on principle as a supplement to enhance disclosures (June '21)
- At the Financial System Council, the Financial Services Agency discussed the ideal form for sustainability disclosures by listed companies that include climate change (From September '21)

*1: Guidance on Climate-related Financial Disclosures
*2: Guidance for Utilizing Climate-related Information to Promote Green Investment 2.0

*As of the end of January 2022

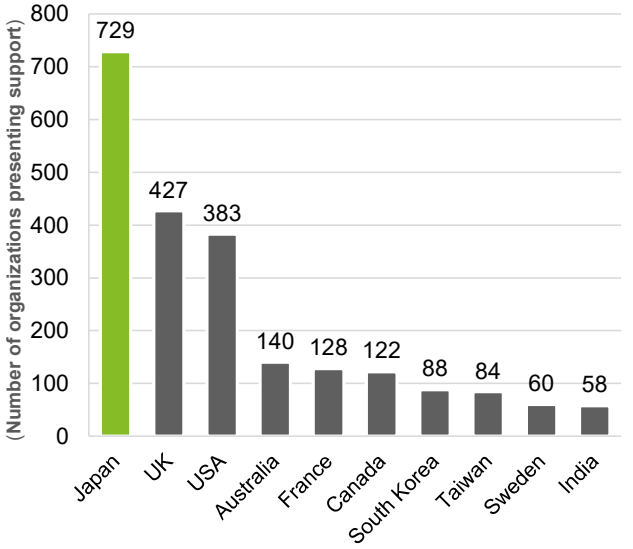
Sources: TCFD, "2021 Status Report", Ministry of the Environment; European Union Commission website, etc

[Status of support for TCFD]

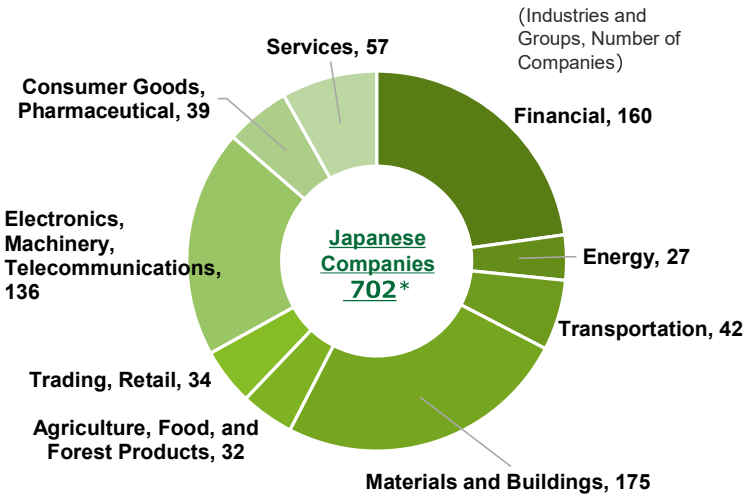
Japan ranks first in the world in terms of the number of organizations expressing support, with expressions of support from companies in many diverse sectors

- 83 countries, 3,075 companies, governments, multilateral institutions, private organizations, etc., expressed their support for TCFD (As of February 28, 2022). The Ministry of the Environment on July 27, 2018, the Ministry of Economy, Trade and Industries on December 26, 2018.
- Total assets of financial institutions that have expressed their support already exceed 194 trillion USD and have continued to increase thereafter (from the 2021 Status Report).

Number of Organizations Presenting Support (Top 10 countries & regions) (as of February 28, 2022)



Number of Japanese Companies Presenting Support (as of February 28, 2021)

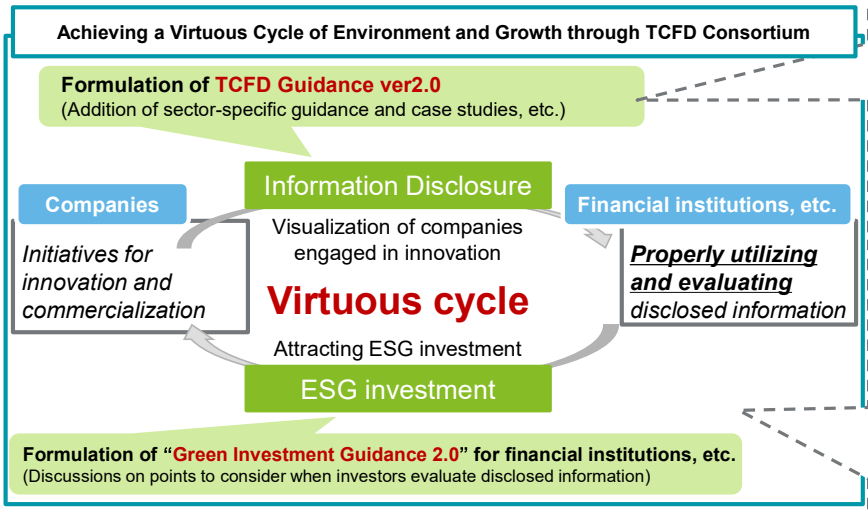


See below (the Ministry of the Environment website) for the latest number of companies presenting support and their names
http://www.env.go.jp/earth/datsutansokeiei.html

Source: TCFD website
*The number of organizations presenting support in Japan is 729, and the number of companies presenting support in Japan (including general incorporated associations and law firms in addition to general companies) is 702. (as of February 28, 2022)

[Outline of TCFD Consortium]

- In view of the increased awareness on corporate disclosure and use of climate-related information highlighted by the Task Force on Climate-related Financial Disclosures (TCFD) in Japan, **the private-led TCFD Consortium was established on May 27, 2019**, by five founders.
  * Founders of the consortium: Professor Kunio Ito of Hitotsubashi University; Chairman Hiroaki Nakanishi of Keidanren (Japan Business Federation); Chair Makoto Takashima of the Japan Bankers Association; President and Chief Executive Officer Takehiko Kakiuchi of Mitsubishi Corporation; and Chairman of the Board Shuzo Sumi of Tokyo Marine Holdings.
- The Consortium aims to further discussion on **effective corporate disclosure of climate-related information and their use by financial institutions for appropriate investment decision**.
- Published **"Green Investment Guidance"** (October 2019), which explains **the perspective investors should have when interpreting information disclosed in line with TCFD recommendations**, and **"TCFD Guidance 2.0"** (July 2020) (revised version of the December 2018 guidance developed by METI), which explains the TCFD Final Report from a corporate perspective
- Published **"Guidance for Utilizing Climate-related Information to Promote Green Investment 2.0 (Green Investment Guidance 2.0)" in October 2021** and **made a worldwide announcement concerning this at the TCFD Summit 2021** held October 5. 2021



- An explanation of TCFD's Final Report to provide a first step toward TCFD disclosure, thereby encouraging disclosure by companies based on the TCFD recommendations.
  - ➢ See below for more information on TCFD guidance. https://tcfd-consortium.jp/news_detail/20073103

- Based on the increase in corporate information disclosure, it provides commentaries on perspectives needed by investors and other stakeholders when understanding the disclosed information.
- It is also expected that companies will deepen their understanding of the viewpoints of investors and other stakeholders, leading to further disclosure.
  - ➢ See below for more information on Green Investment Guidance 2.0. https://tcfd-consortium.jp/news_detail/21100501

Source: TCFD Consortium

[Guidance/guides related to the TCFD in Japan]
"Guidance on Climate-related Financial Disclosures (TCFD Guidance)", "Guidance for Utilizing Climate-related Information to Promote Green Investment (Green Investment Guidance)", and "Practical guide for Scenario Analysis in line with the TCFD recommendations" (this guide)

Practical guide for Scenario Analysis in line with the TCFD recommendations 2021
(this guide)

- Published by the Ministry of the Environment(March 2022)
- **Explains c) scenario analysis in Strategy** which is one of the recommended disclosure items in the TCFD recommendations
- Covers all industries

Guidance on Climate-related Financial Disclosures 2.0
(TCFD Guidance 2.0)

- Published by the TCFD Consortium (July 2020)
- Explains **the recommended disclosure items in the TCFD recommendations**
- Covers all industries
- Industry-specific guidance is also provided for the following industries: automobiles; steel; chemicals; electrical machinery/electronics; energy; food products; banking; life insurance, and non-life insurance

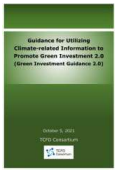
Companies

Promotion of climate change-related initiatives → **Disclosure of climate change-related information**

Investors

Assessment of climate change-related information disclosure

Guidance for Utilizing Climate-related Information to Promote Green Investment 2.0
(Green Investment Guidance 2.0)



- Published by the TCFD Consortium(October 2021)
- Provides an explanation that **includes the perspectives needed by investors and similar stakeholders in interpreting disclosure information** for recommended disclosure items in the TCFD recommendations

Sources: TCFD Consortium, Ministry of the Environment websites

→See Appendix for the list of TCFD-related literature

[The TCFD recommendations and disclosure contents]

Repeat of earlier page

The TCFD recommendations are structured around four thematic areas: Governance, strategy, risk management, and metrics and targets. In the "Strategy" section of the TCFD recommendations, the implementation of climate change scenario analysis is recommended

Recommended disclosures	Governance	Strategy	Risk Management	Metrics and Targets
Areas in detail	Disclose the organization's governance around climate-related risks and opportunities	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material	Disclose how the organization identifies, assesses, and manages climate-related risks	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material
Recommended Disclosures	a) Describe the board's oversight of climate-related risks and opportunities	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	a) Describe the organization's processes for identifying and assessing climate-related risks	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process
	b) Describe management's role in assessing and managing climate-related risks and opportunities	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	b) Describe the organization's processes for managing climate-related risks	b) Disclose Scope 1, Scope 2, and if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks
		c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management	c) Describe the targets used by the organization to manage climate-related risks and opportunities, and performance against targets

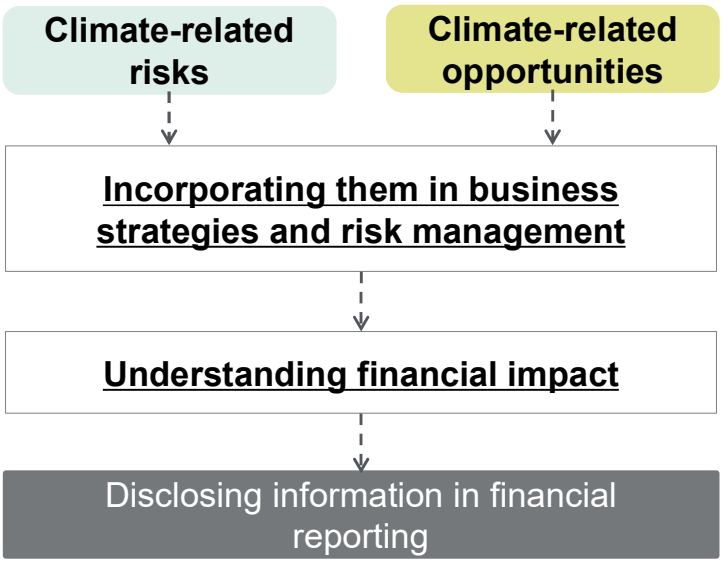
(Differences with the existing information disclosure system)

- Implementation of scenario analysis:
  Recommends disclosure of information using **specific climate-related scenario analysis** as recommended by the TCFD

Source: prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.14

[Requirement of the TCFD Recommendations]

The TCFD recommendations disclosure of information related to climate change that poses financial risks and opportunities

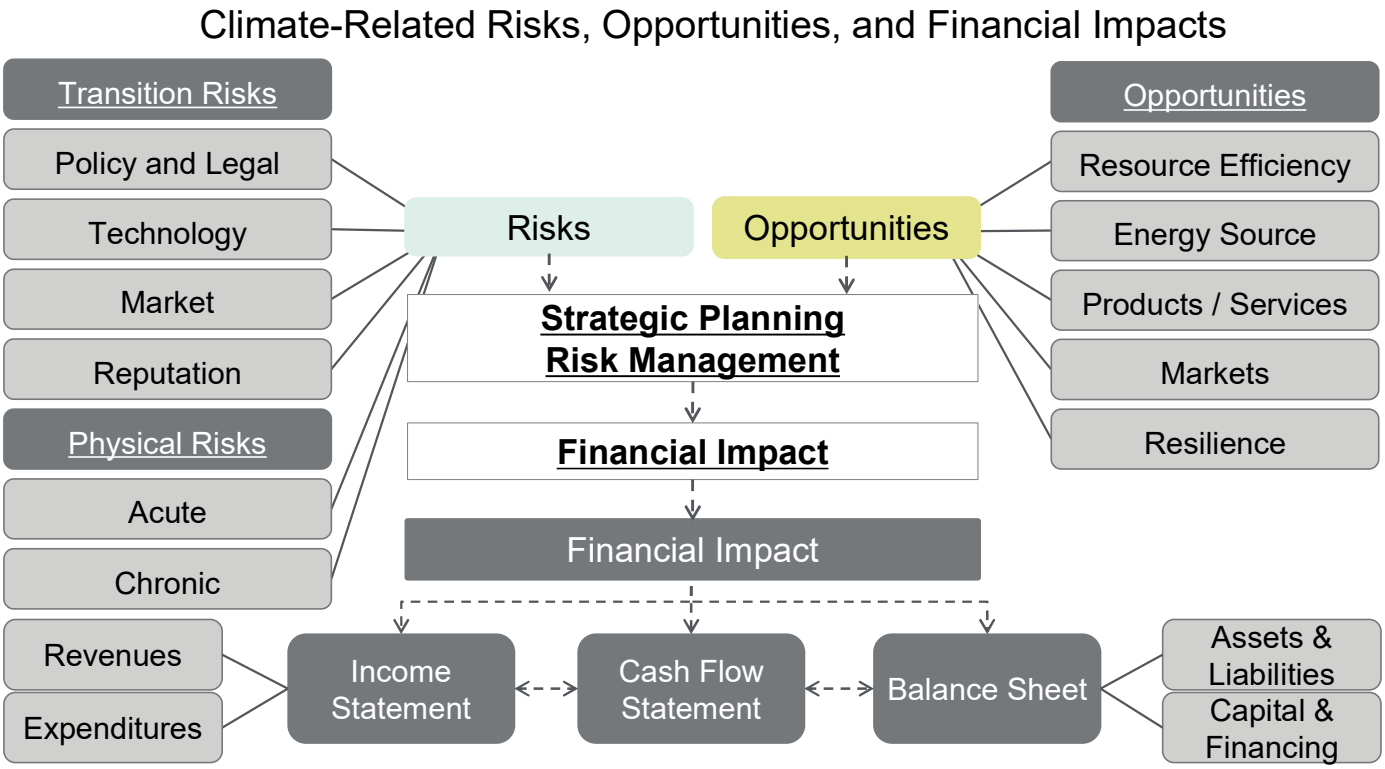


The TCFD recommendations request all companies to (i) use different climate-related scenarios, including a 2°C or lower scenario to (ii) assess their climate-related risks and opportunities, (iii) incorporate such risks and opportunities in their business strategies and risk management, and (iv) understand and disclose their financial impacts.

Sources: prepared by the Ministry of the Environment based on the page 9 of Financial Services Agency's document, "On Reports of the Task Force on Climate related Financial Disclosures (TCFD)" for briefings on "Final Report"

[Financial Impact]

The TCFD recommendations present the scope of climate-related risks and opportunities, and financial impacts to be disclosed



Source: Prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.8

[Climate-related Risks]
The TCFD Recommendations divided climate-related risks into two major categories: (1) risks related to the transition to a lower-carbon economy and (2) risks related to the physical impacts of climate change

Category	Definition	Type	Major aspects and policy actions
Transition Risks	Risks related to the transition to a lower-carbon economy	Policy and Legal	Enhancing regulations on GHG emissions, imposing greater obligations on information disclosure
		Technology	Replacing existing products with those based on low-carbon technologies, investing in new technologies that eventually turn out to be a failure
		Market	Changes in consumer behaviors, market signals with greater uncertainty, a rise in materials and costs
		Reputation	Changes in customer or community perceptions, criticism against certain industries, increased concern among stakeholders
Physical Risks	Risks related to the physical impacts of climate change	Acute	Event-driven risks, including severity of extreme events such as cyclones or floods
		Chronic	Longer-term shifts in climate patterns, including sustained higher temperatures, which may cause sea level rise or chronic heat waves

Source: prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.10

1-29

[Climate-related Opportunities]
The TCFD recommendations identified the following five areas of climate-related opportunities that organizations can produce in the course of their efforts to mitigate and adapt to climate change

	Area	Policy actions	Financial impact
Opportunities	**Resource Efficiency**	■ Use of more efficient models of transport ■ Use of more efficient production and distribution processes ■ Use of Recycling ■ Move to more efficient buildings ■ Reduced water usage and consumption	■ Reduced operating costs (e.g., through efficiency gains and cost reductions) ■ Increased production capacity, resulting in increased revenues ■ Increased value of fixed assets (e.g., highly rated energy-efficient buildings) ■ Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs
	Energy Source	■ Use of lower-emission sources of energy ■ Use of supportive policy incentives ■ Use of new technologies ■ Participation in carbon market ■ Shift toward decentralized energy generation	■ Reduced operational costs (e.g., through use of lowest cost abatement) ■ Reduced exposure to future fossil fuel price increases ■ Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon ■ Returns on investment in low-emissions technology ■ Increased capital availability (e.g., as more investors favor lower-emissions producers) ■ Reputational benefits resulting in increased demand for goods/services
	Products and Services	■ Development and/or expansion of low emission goods and services ■ Development of climate adaptation and insurance risk solutions ■ Development of new products or services through R&D and innovation ■ Ability to diversify business activities	■ Increased revenue through demand for lower emissions products and services ■ Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services) ■ Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
	Markets	■ Access to new markets ■ Use of public-sector incentives ■ Access to new assets and locations needing insurance coverage	■ Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks) ■ Increased diversification of financial assets (e.g., green bonds and infrastructure)
	Resilience	■ Participation in renewable energy programs and adaptation of energy-efficiency measures ■ Resource substitutes/diversification	■ Increased market valuation through resilience planning ■ Increased reliability of supply chain and ability to operate under various conditions ■ Increased revenue through new products and services

Source: prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.11

1-30

[Guidance for Specific Sectors]

The TCFD supplemental guidance, such as "Annex" and "Technical Supplement", provides additional context and suggestions for implementing the recommended disclosures for four non-financial sectors (Energy; Transportation; Materials and Buildings; and Agriculture, Food, and Forest Products) potentially most affected by climate change

Sector	Industry	Recommended disclosure
Energy	■ Oil and Gas ■ Coal ■ Electric Utilities	Assessment and potential impacts of **legal compliance, operating costs, changes in risks and opportunities; changes in regulations and shift in consumer and investor preferences; and changes in investment strategy**
Transportation	■ Air Transport, Maritime Transportation ■ Land Transportation (Rail Transportation, Tracking Services) ■ Automobiles	Assessment and potential impacts of **financial risks of enhanced regulations and new technology on existing factories and equipment; R&D investment in new technologies; opportunities for use of new technologies to lower emissions standards and regulations on higher fuel efficiency**
Materials and Buildings	■ Metals and Mining ■ Chemicals ■ Construction Materials, Capital Goods ■ Real Estate Management and Development	Assessment and potential impacts of **enhanced regulations on GHG emissions and carbon pricing; risk assessment of increased severity of extreme weather events on construction materials and property; and opportunities for products to improve energy efficiency or reduce energy consumption**
Agriculture, Food, and Forest Products	■ Beverages, Foods ■ Agriculture ■ Paper and Forest Products	Assessment and potential impacts of **GHG emissions reductions; recycling and waste management; business of food and textile products with lower GHG emissions, and shifts in consumer preferences**

Source: Prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.52-65

1-31

[Governance]

To incorporate climate-related risks and opportunities in business strategy, an organization should establish a system involving management. The TCFD recommendations require an organization to describe the board's oversight of climate-related risks and opportunities, and management's role in assessing and managing such risks and opportunities

The organization's governance around climate-related risks and opportunities

The board's oversight of climate-related risks and opportunities

- Processes and frequency by which the board and/or board committees are informed about climate-related issues
- Whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as setting the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures
- How the board monitors and oversees progress against goals and targets for addressing climate-related issues

Management role in assessing and managing climate-related risks and opportunities

- Whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues
- A description of the associated organizational structure(s)
- How management (through specific positions and/or management committees) monitors climate-related issues

Source: Prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.19

1-32

[Strategy]

The TCFD recommendations require an organization to describe the climate-related risks and opportunities over the short, medium, and long term; their impacts on the organization's businesses, strategy, and financial planning; and the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario

Impact on the organization's businesses, strategy, and financial planning (where relevant information is critical)

The climate-related risks and opportunities the organization has identified over the short, medium, and long term

- A description of what they consider to be the relevant short, medium, and long-term time horizons
- The specific climate-related issues for each time horizon that could have a material financial impact on the organization
- The process(es) used to determine which risks and opportunities could have a material financial impact on the organization

The impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

- How identified climate-related issues have affected their businesses, strategy, and financial planning
- The impact on their businesses and strategy in the areas of products and services; supply chain and/or value chain; adaptation and mitigation activities; investment in research and development; and operations
- The impact of climate-related issues on operating costs and revenues; capital expenditures and capital allocation; acquisitions or divestments; and access to capital

The resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario

- How resilient their strategies are to climate-related risks and opportunities
- Where they believe their strategies may be affected by climate-related risks and opportunities; how their strategies might change to address such potential risks and opportunities; and the climate-related scenarios and associated time horizon(s)

Source: prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.20-21

[Risk Management]

The TCFD recommendations require an organization to describe the organization's processes for identifying, assessing, and managing climate-related risks, as well as how these processes are integrated into the organization's overall risk management

How the organization identifies, assesses, and manages climate-related risks

The Organization's processes for identifying and assessing climate-related risks

- Their risk management processes for identifying and assessing climate-related risks (An important aspect is how the organization determines the relative materiality of climate-related risks in relation to other risks)
- Whether they consider existing and emerging regulatory requirements related to climate change
- Their processes for assessing the potential size and scope of identified climate-related risks; and definitions of risk terminology used or references to existing risk classification frameworks used

The organization's processes for managing climate-related risks

- Their processes for managing climate-related risks, (including how they make decisions to mitigate, transfer, accept, or control those risks)
- Their processes for prioritizing climate-related risks, (including how materiality determinations are made)

How processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risks management

- How their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management

Source: prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.21-22

[Metrics and Targets]

The TCFD recommendations require an organization to describe the metrics used to assess climate-related risks and opportunities in line with its strategy and risk management process; GHG emissions; the targets to manage climate-related risks and opportunities, and performance against targets

The metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material

The metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process

- The key metrics used to measure and manage climate-related risks and opportunities (organizations should consider including metrics associated with water, energy, land use, and waste management)
- Whether and how related performance metrics are incorporated into remuneration policies (where climate-related issues are material)
- Their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a lower-carbon economy
- Metrics should be provided for historical periods to allow for trend analysis. The methodologies used to calculate or estimate metrics should also be included.

Scope 1, Scope 2, and if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks

- GHG emissions calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions
- Related, generally accepted industry-specific GHG efficiency ratios (as appropriate)
- GHG emissions and associated metrics should be provided for historical periods. The methodologies used to calculate or estimate the metrics should also be included.

The targets used by the organization to manage climate-related risks and opportunities and performance against targets

- Their key climate-related targets (such as those related to GHG emissions, water usage, energy usage)
- Other goals including efficiency or financial goals through the entire life cycle of products and services
- Whether the target is absolute or intensity; time frames over which the target applies; key performance indicators, etc.

Source: Prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures, "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2017. p.22-23

[Significance of Scenario Analysis (1)]

Information disclosure using scenario analysis is recommended for evaluating the impact made by climate-related risks and opportunities; 1.5°C scenarios are becoming more complete and are useful for companies to consider their decarbonization strategies

Usefulness of scenario analysis

- Scenario analysis is a useful method for organizations to use to strategically address issues that are long-term and have a high level of uncertainty
- **Disclosures** should **also include premises for key scenarios in industries where climate change-related risks are a concern.** Scenario analysis requires ability / manpower, but it also holds benefits for organizations

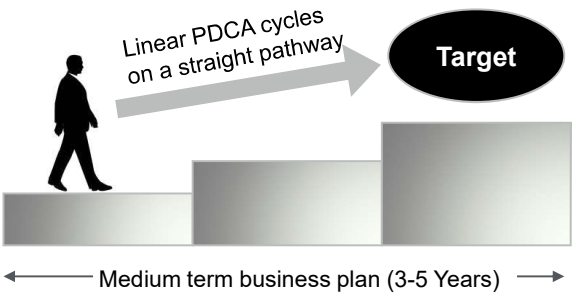
Target	Scenario groups that may be applied
Transition risks	■ IEA WEO NZE2050 / IEA WEO SDS / IEA WEO APS / IEA ETP 2DS / IEA WEO STEPS ■ Deep Decarbonization Pathways Project (the target of 2°C is achieved) ■ IRENA REmap(the renewable energy ratio is doubled by 2030) ■ Greenpeace Advanced Energy [R]evolution (the target of 2°C is achieved) ■ PRI 1.5°C RPS (Required Policy Scenario), PRI FPS (Forecast Policy Scenario)
Physical risks	■ RCP (Representative Concentration Pathways) scenarios employed by the IPCC: RCP8.5, RCP6.0, RCP4.5, RCP2.6

Sources: Prepared by the Ministry of the Environment based on the Task Force on Climate-related Financial Disclosures: "Final Report - Recommendations of the Task Force on Climate-related Financial Disclosures", 2019, pages 25 - 20;
Task Force on Climate-related Financial Disclosures: "Supplementary Guidance - Using scenario analysis for disclosing climate-related risks and opportunities", 2017, p.21 & 25
The scenarios listed in the IEA WEO have been updated to reflect the most recently published report

[Significance of Scenario Analysis (2)]

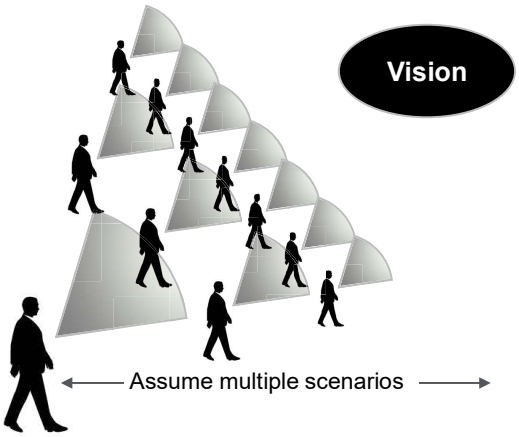
Scenario analysis enables strategic planning and internal/external dialogue in response to future uncertainties

In a reasonable foreseeable term…



- Business strategy cannot respond to changes in the future
- The discussion never reaches a consensus on future perspectives
- Suspected of lacking business resilience

In a longer term, where outcomes are highly uncertain, and possibly promising…



- Business management can flexibly respond to future change
- The discussion takes places without any subjective viewpoints on future
- Management can demonstrate business resilience

[Latest TCFD Discussion]

In 2021, TCFD revised its Annex for helping companies implement the recommended disclosure items, recommending consideration of long-term transitions, Scope 3 disclosures, and disclosure of specific strategies for decarbonization

Revised version of the Annex
A practical guide for translating the TCFD recommendations into practice, which is similar to the TCFD recommendations ("Final Report")

Primary changes (issued 2017, revised 2021)

- Added language regarding **transition plans and interim targets**
- **Recommends disclosure of Scope 1 and Scope 2 GHG emissions regardless of materiality evaluation**
- **Encourages companies to consider disclosing Scope 3 emissions**
  - While it stops short of saying that companies "should consider disclosing" these, the notes state that it "strongly encourages"

Future points for discussion

- Indicates **that transition plans, interim targets, and Scope 3 emissions will be TCFD's focal themes / points of discussion on climate change-related disclosures in the future**, and that requests for disclosure from investors, etc., are expected to gradually increase in the future

Annex: Implementing the Recommendations of the Task Force on Climate-related Financial Disclosure

Transitions (transition plans)

- (Excerpt from original)
  "Organizations that have made GHG emissions reduction commitments, …(omitted)…**should describe their plans for transitioning** to a low-carbon economy"

Scope3 disclosures

- (Excerpt from original)
  "All organizations **should consider disclosing** Scope 3 GHG emissions*"

*:The Task Force **strongly encourages** all organizations to **disclose Scope 3 GHG emissions.** (Excerpt from notes)

Source: TCFD "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" (October 2021)

[(Reference) Disclosure contents required by the TCFD recommendations]

In the "Metrics and Targets" area in the TCFD recommendations, disclosure of Scope 1, Scope 2, and appropriate Scope 3 GHG emissions is recommended

Recommended disclosures	Governance	Strategy	Risk Management	Metrics and Targets
Areas in detail	Disclose the organization's governance around climate-related risks and opportunities	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material	Disclose how the organization identifies, assesses, and manages climate-related risks	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material
Recommended Disclosures	a) Describe the board's oversight of climate-related risks and opportunities	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	a) Describe the organization's processes for identifying and assessing climate-related risks	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process
	b) Describe management's role in assessing and managing climate-related risks and opportunities	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	b) Describe the organization's processes for managing climate-related risks	**b) Disclose Scope 1, Scope 2, and if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks**
		c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management	c) Describe the targets used by the organization to manage climate-related risks and opportunities, and performance against targets

(Definition of applicable Scope 3 emissions)

- The notes to the revised Annex contain the following explanation on disclosure of Scope 3 emissions:
  "**When considering whether to disclose Scope3 GHG emissions, organizations should consider whether such emissions are a significant portion of their total GHG emissions**. For example, see discussion of 40% threshold in the Science Based Targets Initiatives (SBTi's) paper, SBTi Criteria and Recommendations, Ver4.2, Section V, p.10"

Sources: Task Force on Climate-related Financial Disclosures, "Recommendations of the Task Force on Climate-related Financial Disclosures (Final Version)」, 2017 postscript, TCFD "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" (October 2021)

2. Scenario Analysis - Key Points of Practice

Scenario Analysis Guide - Key Points of Practice

2-1. For beginning scenario analysis

2-2. STEP2. Assess materiality of climate-related risks

2-3. STEP3. Identify and define range of scenarios

2-4. STEP4. Evaluate business impacts

2-5. STEP5. Identify potential responses

2-6. STEP6. Document and disclose information

Chapter 2. Scenario Analysis - Key Points of Practice

This chapter explains how to practically undertake scenario analysis and describes key points of its practice, based on use cases performed by companies under the support program of the Ministry of the Environment.

Scenario Analysis Guide – Key Points of Practice

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2. Scenario Analysis - Key Points of Practice

The momentum for decarbonization among various countries and institutional investors is growing[1], and climate change has now become a clear risk and opportunity for corporate management. In Japan, "carbon neutrality by 2050" was declared in October 2020, and with the revision of the Corporate Governance Code[2] in June 2021, companies listed on the prime market will be required to disclose their response to the TCFD recommendations. The importance of responding to climate change, including addressing the TCFD recommendations that require disclosure of climate-related information, is increasing.

In the TCFD recommendations' recommended disclosure items, the strategy section encourages the implementation of climate change scenario analysis in the following passage: "Describe the resilience of the organization's strategy based on a review of various climate-related scenarios, including scenarios for under 2°C"[3]. In response, we will use this section to explain the practical process for undertaking scenario analysis and to describe key points in its implementation based on use cases of companies under the support program of the Ministry of the Environment. Furthermore, in each initiative "STEP", we will describe a step-by-step direction for initiatives in line with the actual situation of the company as shown below.

・For companies that are conducting scenario analysis for the "first time," such as companies in their first year of scenario analysis (companies in their "first round" of scenario analysis): these companies should conduct scenario analysis in a sure and steady manner while keeping in mind the key points of practice in this guide. They should also work on implementing the "points for continuing companies" as much as possible.

・For companies that are conducting scenario analysis for the "first time", but which are already working on initiatives related to climate change to some degree, or

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[1] Refer to Chapter 1 for information on the materiality of responding to TCFD recommendations, such as decarbonization trends for various nations and institutional investors.

[2] For details on the revision of the Corporate Governance Code, refer to Chapter 1, p.1-8

[3] Refer to Chapter 1, p.1-6.

companies that have already implemented scenario analysis (companies in their "second round" of scenario analysis): these companies should move on to the next step of "points for continuing companies" and use this to increase the sophistication of climate change-related management. Additionally, they should use disclosures and dialogue with investors to enhance analysis and the presentation of evidence.

2-1. For beginning scenario analysis

When beginning scenario analysis, the first step in preparation is to involve internal stakeholders and establish a target scope for scenario analysis. Specifically, the following must be done: 1) Having management understand the materiality of responding to TCFD recommendations (having management be aware of the recommendations and instruct that they be complied with); 2) Establishing an execution team; 3) Choosing a target scope for scenario analysis; and 4) Selecting a time frame of "X" years in the future to look at when conducting the scenario analysis. In this preparation stage, the key is in how to input climate change initiatives into management.

For companies undertaking scenario analysis for the first time, the following are important measures for beginning the analysis: establishing internal consensus for conducting scenario analysis (management has agreed); asking for cooperation from operation divisions; and deciding on the target scope/parties responsible (structure) for scenario analysis.

Meanwhile, companies that are continuing to conduct scenario analysis should aim for the following: having management/responsible departments understand the results of the previous scenario analysis, and having operation divisions take the lead in conducting the analysis; and expanding the target scope/responsible parties (structure) beyond what it was for the initial analysis.

1. Gain management's understanding

As the first step in preparation, it is necessary to obtain the understanding of the management team concerning the materiality of conducting scenario analysis.

Conscientious communication with the management team facilitates internal involvement in scenario analysis through helping management recognize what TCFD recommendations are and having them advance the initiatives necessary for scenario analysis in a top-down approach.

First of all, it is crucial for management to understand that investors expect that the scenario analysis the company performs in the course of its operations (i.e., recognition of a broad range of risks and identification of potential responses should the risk actually occur) should also include climate change. For example, if the company only envisions a foreseeable future with a reasonable degree of probability, it will only formulate linear PDCA cycles toward goals. This may result in business strategies that cannot respond immediately to future changes and lack of consensus regarding the company's future, which may result in risks such as investors questioning the resilience of the business. On the other hand, formulating hypotheses based on an uncertain future (and therefore one that also holds possibilities) allows business management that responds flexibly to future changes, enables discussion to take place without subjective viewpoints regarding the future, and allows management to assert the resilience of the business.

When gaining the understanding of the management team, it is also effective to have study groups with experts provide input on the potential impact of climate change responses on corporate value. There are increasingly frequent requests from multi-stakeholders for responses to climate change, so there may also be cases when management hears about these trends directly. However, it is still common that those messages do not reach management. In these cases, it is important to compile the "status of requests from multi-stakeholders" and provide input to management through study groups with experts and other means on the possible impact of climate change responses on corporate value.

Even for companies in their second round of scenario analysis, continuing to provide input to management from the results of climate change-related scenario analysis will further deepen management's understanding of the specific opportunities and risks climate change holds for the company, and may lead to increased integration of climate change initiatives and business management within the company.

2. Create an execution team for scenario analysis

The second step for preparation is creating an execution team for scenario analysis. Internal involvement is essential for conducting scenario analysis. Because of this, a team should be formed where operation divisions are involved from the very beginning. Having the responsible parties in operation divisions understand the scenario analysis processes enables the divisions to think of climate change initiatives as something that involves them directly.

There are two separate patterns hypothesized for the structure of scenario analysis execution teams. The first is a pattern where relevant divisions and departments are involved as needed during the course of the scenario analysis. The second pattern is for the internal teams to be formed prior to beginning the analysis. The first pattern has the advantages of making the scenario analysis easy to begin, and of placing a minimal burden on each division/department. On the other hand, its disadvantages include the need for internal coordination in the scenario analysis process and the long reporting process from the environment/CSR division to management. For the second pattern, the advantages are that divisions are better able to cooperate due to internal coordination being completed in advance, and that reports reach management swiftly due to the analysis being conducted by a well-coordinated team. However, its disadvantages are that it takes time to start the analysis, and that there is a large burden on each division/department.

For use cases of involving operational divisions for companies that have implemented scenario analysis, the following examples have been cited as being effective: 1) using narratives suited to each division (e.g., how reductions in CO2 emissions over the entire company can be promoted through contributions by various areas such as products and procurement), and 2) leveraging management's commitment. Furthermore, regular communication of information related to TCFD recommendations and scenario analysis can facilitate understanding and make it easier to receive cooperation when moving ahead with the scenario analysis.

3. Choose target for analysis

The third step for preparation is selecting a target scope for scenario analysis. When considering a target scope, the following should be determined: the region (e.g., only domestic sites, or including overseas sites), the scope of operations (only some businesses or all businesses), and the corporate scope (only for the scope of the consolidated financial statements or including subsidiaries).

By defining the scope of operations covered in the scenario analysis in terms of "sales composition", "relation to climate change", and "difficulty of data collection", companies can conduct scenario analysis in accordance with their business model. For example, companies might consider covering operations with particularly high sales in the scope defined as "sales composition", or they might cover operations with high CO2 emissions by using the scope "relation to climate change". Operations that are easy to collect data for may be covered in the scope defined as "difficulty of data collection", and so on.

In scenario analysis support, it is common to first select certain operations to cover in the analysis, and then gradually lead up to a scenario analysis for the company as a whole.

4. Choose time horizon to conduct scenario analysis

Select which year in the future to look at when conducting the scenario analysis. Since the worldviews showing the impacts of climate change vary depending on the year that the analysis is based on, companies should select a time horizon with the maximum benefit for the company after comparing advantages and disadvantages in light of factors such as project length, the amount of internal involvement, and effect from physical risks on the company.

Considering decarbonization trends such as carbon neutrality in 2050, it is assumed that scenario analysis for 2050 will be useful in the current situation. Other advantages of selecting 2050 are that physical risks due to temperature rise and transition risks such as carbon taxes are emerging, and the results of the impact of risks and opportunities will be clearly apparent. On the other hand, the disadvantage is that the distance from the time axis of the business plan makes it difficult to imagine the project realistically, which makes internal involvement difficult and sometimes makes collaboration difficult.

For other sectors where climate change is material, it is possible to consider mid- to long-term appropriate "transition to decarbonization"[4] toward carbon neutrality by 2050, by conducting scenario analysis for the year 2030 in addition to 2050. The advantages of selecting 2030 additionally are that it is easy to involve the management and the company, since there is abundant data available for reference and it is relatively easy to link with business plans.

[4] For details on the consideration of transitions, refer to Chapter 2, p.2-15.

2-2. STEP2. Assess materiality of climate-related risks

After finishing the preparations for scenario analysis, it is time to assess the risks and opportunities the company will face from the effects of climate change. The company should assess the materiality of these from the perspectives of whether or not the risks and opportunities hold the potential for significant impact in the future or if they are of concern to stakeholders.

Specifically, risk materiality should be determined through the following process: 1) list risks/opportunities for the targeted operation; 2) express the potential impact on operations from each listed risk/opportunity using qualitative terms; 3) determine the materiality of the risk based on how serious the impact on operations will be if the risk actually occurs. The key is to select risks from an industry/company perspective, and to consider the level of granularity to be used in assessing risk materiality.

For companies undertaking scenario analysis for the first time, the following are important when assessing the materiality of risks: climate-related risks material to the sector and company have been identified, and the specific impacts of these risks have been hypothesized.

Meanwhile, companies who are continuing to conduct scenario analysis should aim for greater fleshing out of climate-related risks that are material to the sector and company, and of the specific impact of risks. They should do this by involving operation divisions and outside experts, and while considering dialogue with investors on the results of prior scenario analysis.

1. <u>List risk items</u>

For Phase 1, the company should list out risk and opportunity items for the operation division it chose to target in the preparation stage. The company should make a list of risk and opportunity items based on the examples of risks and opportunities listed in the TCFD recommendations and in consideration of external reports such as industry-specific reports and other external information such as competitors' CDP responses. When doing this, it is important that the company consider and list a wide range of possible risks and opportunities to eliminate the unexpected, rather than attempting to keep the number of risk items listed to a minimum.

The listed risks and opportunities should be divided into two broad categories: transition risks, which are related to the transition to a low-carbon economy, and physical risks, which are related to physical changes caused by climate change. Examples of transition risks include risks from policies and regulations; market risks; technology risks; and reputational risks (changes in reputation with customers or investors). Meanwhile, physical risks include risks that occur on a chronic basis (e.g., increase in average temperature, changes in rainfall and weather patterns, rising sea level) and risks that occur on an acute basis (e.g., increasing severity of extreme weather conditions). When considering risk items, companies may wish to refer to examples of risk items used by support project companies.[5]

2. Identify potential impacts on business

The company will qualitatively identify the impact on business, and use qualitative terms to describe the potential impact on business from the risks and opportunities listed in Phase 1. When doing this, it is important that the company separates risks and opportunities and evaluates opportunities as well as risks.

The company should use the results of discussions with internal stakeholders as input when making qualitative descriptions, while also referring to external information such as external reports and CDP responses from competitors. For discussions with internal stakeholders, in particular: the important thing is that the company match its awareness with stakeholders and use a narrative (story-like) format to describe potential impacts based on the company's business model. These discussions on qualitatively describing impact can further deepen mutual understanding of scenario analysis within the company or its divisions/departments. Furthermore, discussions with each individual operation division often reveal unanticipated risks and opportunities. Companies continuing to conduct scenario analysis may also consider holding discussions that include external stakeholders.

3. Assess materiality of climate-related risks

[5] Refer to Chapter 3 for support project company examples.

In Phase 3, the company will determine the materiality of risks based on the scale of impact on business if the risk/opportunity occurs. The company will go on to assess the impact on business for each of the risks/opportunities evaluated in Phase 1 and Phase 2 based on a scale of "Large", "Medium", "Small" and so on.

When assessing materiality, the company should compare each of the risks and opportunities from the perspective of the "scale of impact on the company's business". For example, the company may consider classifying risks/opportunities with a broad range of impact or that affect important products as "Large"; risks/opportunities with no impact on the company as "Small"; and using "Medium" for others. A specific example would be classifying the risk "increases or decreases in important products" as having a "Large" impact on the company's business, as it affects the cost toward raw materials, which occupy a large percentage of the company's sales costs.

It is also key to consider the level of granularity to use when assessing risk materiality. The same risk/opportunity can be evaluated by subcategorizing it by "differences in product (by sector)" or "affected supply chains (by supply chain)" to enable analysis that is adapted to the company's operations. For example, when performing assessment by supply chain, the impact from the same risk may be categorized as "Large" for the procurement stage, but "Small" for the sales stage.

2-3. STEP3. Identify and define range of scenarios

For identifying and defining the range of scenarios in STEP3, the company should define multiple scenarios that encompass the transitional and physical risks related to the organization. The company should examine scenario hypotheses and analysis methods along with perspectives on what scenarios (and narratives) are appropriate for the organization, and which scenarios out of existing scenario groups should be used as references.

The following process will be used to identify and define the range of scenarios: 1) choose scenarios; 2) obtain forecast information on relevant parameters; and 3) shape the worldview in consideration of stakeholders. The key is in selecting the type of scenario while considering the amount of available information and versatility, as well as use cases from competitors. Companies should also consider how they will align worldviews with their relevant divisions/departments.

Companies undertaking scenario analysis for the first time should use reliable external scenarios and select several scenarios (1.5°C/2.6°C-4°C) that include a scenario for 2°C or lower (1.5°C for the current situation). The company should aim toward building internal consensus after detailing the worldview listed in each scenario.

On the other hand, companies that are continuing scenario analysis should aim for the following: using reliable external scenarios and based on dialogue with investors on the results of the previous scenario analysis, supplementing them with additional data for material risks; having selected multiple scenarios, including one for 1.5°C (1.5°C, 2°C, 2.6°C-4°C); and detailing the worldview in each scenario and holding discussions that include outside experts.

1. <u>Choose scenarios</u>

In Phase 1, the company will go on to choose scenarios from multiple temperature ranges, including the below-2°C (1.5°C) scenario, to respond to an uncertain future. Types of scenarios include the IEA's WEO (World Energy Outlook)[6], which is the most

[6] Medium- to long-term energy market forecasts. Lists future information on energy (qualitative/quantitative).

versatile and data-rich, SSP (Shared Socioeconomic Pathways)[7], and the PRI's IPR (Inevitable Policy Response)[8].

The TCFD recommendations encourage companies to perform scenario analysis by selecting scenarios for multiple temperature ranges, including the 2°C or lower scenario. It is important that scenarios be chosen based on their characteristics and parameters, and that scenarios match the company's industry and situation, investor trends, and trends for domestic and international policies. At present, based on the decarbonization trend, the selection of multiple scenarios including the 1.5°C scenario is effective.

The Sixth Assessment Report (AR6) WG1 Report (Natural Science Basis)[9] released by IPCC in 2021 sets multiple temperature ranges. For example, the SSP1-1.9 scenario assumes net zero CO2 emissions in the mid-21st century by adopting climate policies that limit temperature increase to about 1.5°C or less, and limit temperature increase to 1.0-1.8°C (average 1.4°C) relative to the industrial revolution. The SSP1-2.6 scenario is a scenario with zero net CO2 emissions in the second half of the 21st century, limiting temperature increase to 1.3-2.4°C (about 1.8°C). The SSP2-4.5 scenario is at the upper end of the emissions range based on the aggregated Nationally Determined Contributions (NDCs) of each country through 2030, with a temperature increase of 2.1-3.5°C (about 2.7°C), and the SSP3-7.9 Scenario is a scenario where no climate policy is introduced under regional conflictual development and the temperature rise is 2.8-4.6°C (about 3.6°C).[10]

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[7] Socioeconomic scenario based on recent policies and the socioeconomic environment. Lists the macroeconomic information scenarios that are based on for each scenario.

[8] Scenario for climate-related policies that are likely to be implemented in the short-term. Lists qualitative and quantitative forecasts for climate-related policies.

[9] For the IPCC's Sixth Assessment Report, refer the IPCC website:
https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/
(Japanese translation by JMA: https://www.data.jma.go.jp/cpdinfo/ipcc/ar6/index.html)

[10] For a summary of each scenario, refer Ministry of the Environment, "Publication of the Report of Working Group I of the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) (Natural Science Basis)," https://www.env.go.jp/press/109850. html
The attached document "Reference Materials (Overview of the IPCC and Wording Used in the Report)" of the Ministry of the Environment, https://www.env.go.jp/press/109850/116630.pdf

Selecting scenarios in this manner, with different temperature ranges and worldviews whenever possible, may help eliminate the unexpected. When selecting each scenario, it is important to draw an appropriate transition path focusing on decarbonization in 2050 based on the time horizon for scenario analysis that was chosen in the preparation stage.

2. Obtain information on parameters (variables)

For Phase 2, the company will obtain objective forecast information on parameters related to risks/opportunities to enable it to address an uncertain future. The company will also identify the effects of these on the company in further detail. For example, if the popularization of EVs is listed as an opportunity item, the task would be to obtain information on the EV penetration rate for the relevant year of the analysis timeframe.

When obtaining information, the company may use external sources such as IEA, PRI and SSP reports to obtain objective forecast information on parameters for transition risks. For physical risks, it may use climate change impact assessment tools such as physical risk maps and hazard maps.[11]

The point to keep in mind here is that the company may not be able to find all forecast information for the target year set as the analysis time horizon, so it will need to consider using other methods such as estimates and collecting qualitative information. For example, if the analysis timeframe is 2050, but data are only available up to 2040, the company may use estimation to calculate forecast information for 2050. (The company will need to consider which estimation method to use, such as linear or cumulative, according to the type of data). In cases where quantitative information is not available, it may also be useful to use qualitative information to draw a picture of the future world. At this stage, the key is that the company gather a wide range of forecast information on risk/opportunity items without getting too caught up in trying to obtain quantitative information.

[11] Refer to Appendix for examples of transition risk and physical risk parameters.

3. Shape the worldview in consideration of stakeholders

In Phase 3, the company should, if necessary, use forecast information to clarify the worldview surrounding the company, including the behavior of future stakeholders (including investors), and build consensus on the worldview within the company.

In the process of coordinating worldviews with the related divisions/departments, the key is to use dialogue to build a worldview that is convincing to these departments/divisions (including operation divisions). When staging dialogues, the company may consider preparing materials that facilitate discussion to move discussions with operation divisions forward. It can do this by organizing the worldview by factors such as newcomers/sellers/buyers/substitute products/the industry centered on the company, which is a method that uses 5forces analysis (a framework for business environment analysis). The company may also use narrative descriptions or illustrations in these discussion materials to give visible form to the worldview.

It may be useful to aim to build internal consensus after establishing a comprehensive worldview that also incorporates perspectives from outside of the company.

2-4. STEP4. Evaluate business impacts

When evaluating business impacts, we will evaluate the potential effects from each of the scenarios defined in STEP3 on the organization's strategic and financial position, and then perform a sensitivity analysis.

Business impact evaluation is performed by using the following process: 1) identify potential financial indicators affected by risks and opportunities; 2) consider a calculation formula and estimate financial impact; and 3) be aware of the gap between financial indicators in the estimated impact and in the business as usual. The key points are in deciding what kind of internal data can be used for estimation, and how the company treats data that cannot be quantitatively estimated. The company should also take care not to focus excessively on pursuing numerical accuracy.

Companies undertaking scenario analysis for the first time should aim to quantitatively (or qualitatively, if this is difficult) calculate the estimated impact on business for "significant risks", and have a rough understanding of the gap between the estimated impact on business and business as usual. The company will also need to involve operation divisions to obtain their consensus regarding the method of calculating the impact on business and the resulting figures.

Continuing companies should aim for the following: performing trial estimates for quantitative calculation of the impact on business from significant risks, even for impact that was initially calculated qualitatively (though qualitative calculation may still be used where this is difficult); understanding the gap between the impact on business and business as usual; and promoting discussion to obtain consensus from managers and outside experts regarding the method of calculating the impact on business and the resulting figures.

In addition, for sectors where climate change is material, it is useful to conduct business impact evaluation in the target year of 2030 in addition to 2050 from the perspective of decarbonization transitions for both companies undertaking scenario analysis for the first time and continuing companies.

1. <u>Identify potential financial indicators affected by risks and opportunities</u>

In Phase 1, the company should identify which financial indicators from its financial statements (P/L and B/S) are affected by impact on business brought on by climate change.

When identifying the affected financial indicators, the key is in first roughly sorting out whether the business impact falls under "sales" or "expenses" in the P/L. This is because, while changes in expenses may be recorded as-is without any problems, changes in sales become changes in profit (as sales x profit ratio = profit), resulting in a much greater impact. For example, companies may consider organizing impact items in the following manner: having sales be affected by changes in operating revenues due to the effects of climate change, and having expenses be affected by changes in raw material procurement costs, carbon tax fluctuations, and damage from increased physical risk.

By using data that is commonly used by operation divisions (e.g., sales information by business/product, operational costs, cost structure, greenhouse gas emissions), it is possible to create estimates that are closer to actual company conditions. Since the company will need to gather information by making requests of/receiving cooperation from each operation division, it would be ideal to have each operation division develop an understanding of the TCFD recommendations scenario analysis through the preparation phase and the risk materiality assessment.

2. Consider calculation formula and estimate financial impact

In Phase 2, the company will consider a calculation formula for financial indicators, and then estimate the financial impact based on internal information. Since performing calculation for all financial indicators would be too difficult, the key is in starting with financial indicators that are possible to estimate. When estimating financial impacts, for sectors where climate change is material, it is also useful to analyze the year of 2030 in addition to 2050 from the perspective of decarbonization transitions.

The company should consider a calculation formula by combining the data collected when obtaining the forecast information for related parameters in STEP3 with the internal data obtained in Phase 1. A hypothetical example would be taking the financial parameter "carbon tax fluctuations" and using the formula: "the company's 2050 Scope 1 and 2 CO2 emissions amounts (estimated based on internal data) x carbon tax per t-

CO2 for Scope 1 and 2 emissions amounts (obtained from forecast information)".[12]

Interviews with outside experts and continuous monitoring may be effective methods for risk/opportunity items that cannot be quantitatively estimated due to the information being qualitative or having little scientific basis. The key is in classifying risks by review status (evaluated/not yet evaluated) and clarifying what the next action should be. For interviews with external sources, the company could conduct interviews toward outside experts such as research institutes and specialists regarding risks/opportunities that cannot be calculated, and store the interview results as qualitative information. For continuous internal monitoring, the company could perform continuous monitoring in order to obtain up-to-date information on risks/opportunities.

3. Be aware of the gap between future outlook and financial indicators in the business as usual

In Phase 3, the company will develop awareness of the degree of impact on the future business outlook based on the estimate results it calculated in Phase 2. By giving visible form to the degree of impact climate change will have on business outlook as it currently stands (future business targets/plans), the company will be able to grasp which risks/opportunities have a significant impact on business, as well as how great of a threat climate change is to business outlook for future operations/targets.

When giving visible form to impact, the company should not simply make a list of financial figures from impact, but rather use waterfall graphs (for example) to illustrate this by adding/subtracting the estimated financial impact from the predicted operating income for the target year in the scenario analysis time horizon. This will show the final profit figures and make it easier for viewers to visualize the impact.

[12] For examples of calculation formulas, refer Chapter 2, p.2-42 to 2-43.

2-5. STEP5. Identify potential responses

In identifying potential responses for STEP5, the company should identify applicable, realistic choices for managing the identified risks and opportunities. The following responses are indicated here: "changes to the business model", "changes to the portfolio mix", and "investments in capabilities and technologies".

Specifically, the following process will be used: 1) understanding current in-house responses to risks/opportunities; 2) considering future actions for responding to risks and acquiring opportunities; 3) establishing an organizational structure and reviewing specific actions and procedures for the scenario analysis. The company will need to consider whether any modifications should be made to strategic/financial plans. The key is that the company be prepared for multiple scenarios and that it discloses information from the perspective of the reader.

On premise, when considering business strategies, the actions of each operation division are determined in the process of creating the corporate vision, formulating the medium-term business plan, and incorporating the business strategies into the operation division's activities plan. It is possible that, in the course of this process, there may be a difference in the direction taken by operation divisions versus responses based on corporate visions and medium-term business plans that do not take climate change into account. Consequently, it is important that, on principle, the company include climate change in medium-term business plans. If this is not possible, approaches should be made based on management's approval (top-down). The company should take care in such cases, however, as this may vary according to the corporate culture.

Meanwhile, the TCFD recommendations require specific responses, such as portfolio changes, business model changes, and low-carbon investment. However, these are not possible to implement all at once. Consequently, in this Practical Guide, we describe a process that starts with having the company consider responses according to the "limited personnel and time period" of the scenario analysis as an extension of the TCFD recommendations. Based on this, the company will then go on to implement responses for the company as a whole and in a manner that facilitates incorporation into the medium-term business plan and implementation by the related divisions/departments (applicable and realistic options, as stated in the TCFD recommendations).

Companies undertaking scenario analysis for the first time should proceed in the following direction: 1) identify significant risks requiring responses, and understand the company's current response status to significant risks; 2) establish a direction for future responses to significant risks; and 3) create a rough roadmap for implementing future responses/scenario analysis.

On the other hand, continuing companies should establish specific initiatives for future responses to significant risks based on dialogues with investors concerning the results of prior scenario analysis. It is also important that they work to further flesh out roadmaps for implementing these initiatives, as well as the framework for the organization structure needed to carry them out. In addition, one guideline these companies may wish to consider is incorporating TCFD recommendations and climate change as a concept into the medium-term business plan.

1. Understand company's current status on risks management and seizing opportunities

The company should understand its response status concerning risks/opportunities with a large impact on its business and confirm the response status of rival companies if necessary. It is common to have a situation where the company already has responses in place (but relevant parties did not realize this due to barriers between divisions/departments). Because of this, it is key that the company first confirm its current responses while involving internal stakeholders. It will also be important for the company to check that there are no problems with its current initiatives by using other companies as benchmarks.

2. Consider countermeasures for climate-related risk management and seizing opportunities

In Phase 2, the company will consider specific responses for risks/opportunities with a large impact on its business. The important point is in planning responses that are resilient in any given situation. The company may also consider deciding on a rough direction for responses as a bare minimum before going on to consider responses in

the course of ongoing implementation. When considering responses, the members responsible for scenario analysis initiatives may work as a team to come up with examples to use to identify candidates for potentially relevant divisions/departments. For companies that have calculated the business impact for 2030 in addition to 2050, if the impact for 2030 is large, it is important to additionally consider how to recover for 2050 (e.g., investment in technology, expansion of energy-saving facilities, etc.).

Additionally, there may be cases where, when incorporating responses into the medium-term business plan, the members responsible for scenario analysis initiatives will need to negotiate a list of responses with the relevant departments/divisions if climate change has been included in the departments/divisions' activities plans. If a good relationship has already been established with the relevant department/division, it will be possible to immediately select responses that are related to existing business operations (for example, EV development for automobile companies). In cases where there is no relationship with existing business operations, then it will be key to establish responses based on the medium-term business plan described above.

3. Establish practical action plans and an organizational structure

In Phase 3, the company should establish the organizational structure required to proceed with responses and commence with practical actions with the cooperation of the relevant department/division. It should also consider how it will proceed with scenario analysis in the future. Once the responses have been incorporated into the medium-term business plan and management has given its approval, the next step is to establish an organizational structure (involving the relevant departments/divisions) and moving on to practical actions with the relevant departments/divisions. It is important that the company continue conducting scenario analysis itself as well as monitoring external information at least once per year, so the company will need to define the methodology for these processes.

The key points are the following: 1) incorporating climate change into business plans such as medium-term management plans; 2) establishing an organizational structure (or restructuring) based on management's understanding of the above (covered by the required governance items in the TCFD recommendations: "Describe the board's oversight of climate-related risks and opportunities"; and "Describe management's role

in assessing and managing risks and opportunities"[13]). When establishing an organizational system, a cross-sectional organization on climate change and related issues could be created directly under the corporate planning department in order to make the scenario analysis results more effective.

Additionally, it is key that the company conduct scenario analysis/disclosure/business strategy as a cycle (not as a one-time effort, as the goal is to create corporate value), because this will give the process consistency and enable the necessary continuous monitoring.

[13] Refer to Chapter 1, p.1-32.

2-6. STEP6. Document and disclose information

In STEP6, the company will perform information disclosure after appropriately documenting the contents of the steps up to STEP5. In Japan, the revised Corporate Governance Code requires disclosure based on the TCFD recommendations for companies listed on the prime market, and the importance of appropriate disclosure is increasing. In addition, as the Financial Services Agency is considering making disclosure of climate-related information mandatory for listed companies, there is a growing need to deepen the relationship with financial information, and there are increasing cases of disclosure in securities reports[14] as well as in integrated reports, which have been common in the past.

When disclosing, the key points are for the company to document the positioning of the scenario analysis in the TCFD's recommended disclosure items as well as the results obtained from each step to ensure proper disclosure and enhance corporate value. Specifically, this should be done according to the following process: 1) describe the relationship between the TCFD's recommended disclosure items and the scenario analysis; 2) describe the results from each step. It may also be helpful to reference the TCFD Guidance[15].

Companies undertaking scenario analysis for the first time should proceed in the following direction: 1) describe the relationship between the TCFD disclosure items and scenario analysis; 2) describe the results for each step of scenario analysis toward significant risks; and 3) describe the company's response policy to risks.

On the other hand, companies continuing with scenario analysis should aim for the following based on dialogues with investors concerning the results of prior scenario analysis: 1) describe the relationship between TCFD disclosure items and the scenario analysis; 2) describe the results of scenario analysis toward significant risks in as quantitative a manner as possible for each step; and 3) describe the company's response policy to risks and specific initiatives.

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[14] For examples of disclosure in integrated reports and annual reports, refer to Appendix.

[15] Refer to “TCFD Guidance 2.0” at the following URL:
https://tcfd-consortium.jp/pdf/news/20073103/TCFD%20Guidance%202.0.pdf

1. Describe the relationship between the TCFD's recommended disclosure items and the scenario analysis

When performing disclosure, the company should first describe the positioning of the scenario analysis in relation to the TCFD's recommended disclosure items (11 items total)[16]. Specifically, the relevant part of scenario analysis considered here is Strategy: C in the TCFD recommendations, which states: " Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario ".

Scenario analysis is only part of the TCFD's recommended disclosure items, so it may be helpful to effectively use contrast charts and other methods to show an overall picture of the disclosure in line with the TCFD recommendations.

2. Describe the results obtained from each step

The next process is to list the scenario analysis results obtained up until now for each individual step. The key points are to clearly describe what kinds of risks/opportunities have been identified as a result of the scenario analysis and show the organization's strategic resilience regarding climate change, such as what kinds of responses the company will implement. There is the view that it is not the disclosure itself that investors and experts are actually interested in; they are more concerned that the disclosure show the identified risks/opportunities and the impact on business strategy that can be seen in the scenario analysis results.

Specific items that should be included in order to show the organization's strategic resilience include the following: the status of climate change-related governance structure; information of data used as the basis for each scenario analysis; explanation of the appropriate transition of the company toward decarbonization by 2050; current/future initiatives toward risks/opportunities identified from the scenario analysis; narrative for climate change-related value creation based on scenario analysis results; and how the company will proceed with scenario analysis in the future and achieve the goals.

On the other hand, the question of what information to disclose, and to what extent

[16] Refer to Chapter 1, p.1-6.

(when disclosing quantitative information, for example) is an issue often faced by companies undertaking scenario analysis. Some investors say that, in view of the penetration of the system and the recent trend to strengthen disclosure of climate-related information, it has been suggested that the disclosure of quantitative information will also be considered. Companies may consider performing disclosures while bearing in mind that investors are focusing on the effect on business, such as management's involvement in scenario analysis and how scenario analysis results will be leveraged into the company's business/management.

Furthermore, companies should not perform disclosure once and then leave it at that, but rather continuously increase the sophistication of the scenario analysis by having continued dialogue with investors based on the disclosure. Gradually enhancing the disclosure of the information used as evidence in the analysis based on dialogues with investors may lead to increased corporate value.

2. Scenario Analysis - Key Points of Practice

Scenario Analysis Guide - Key Points of Practice

2-1. For beginning scenario analysis

2-2. STEP2. Assess materiality of climate-related risks

2-3. STEP3. Identify and define range of scenarios

2-4. STEP4. Evaluate business impacts

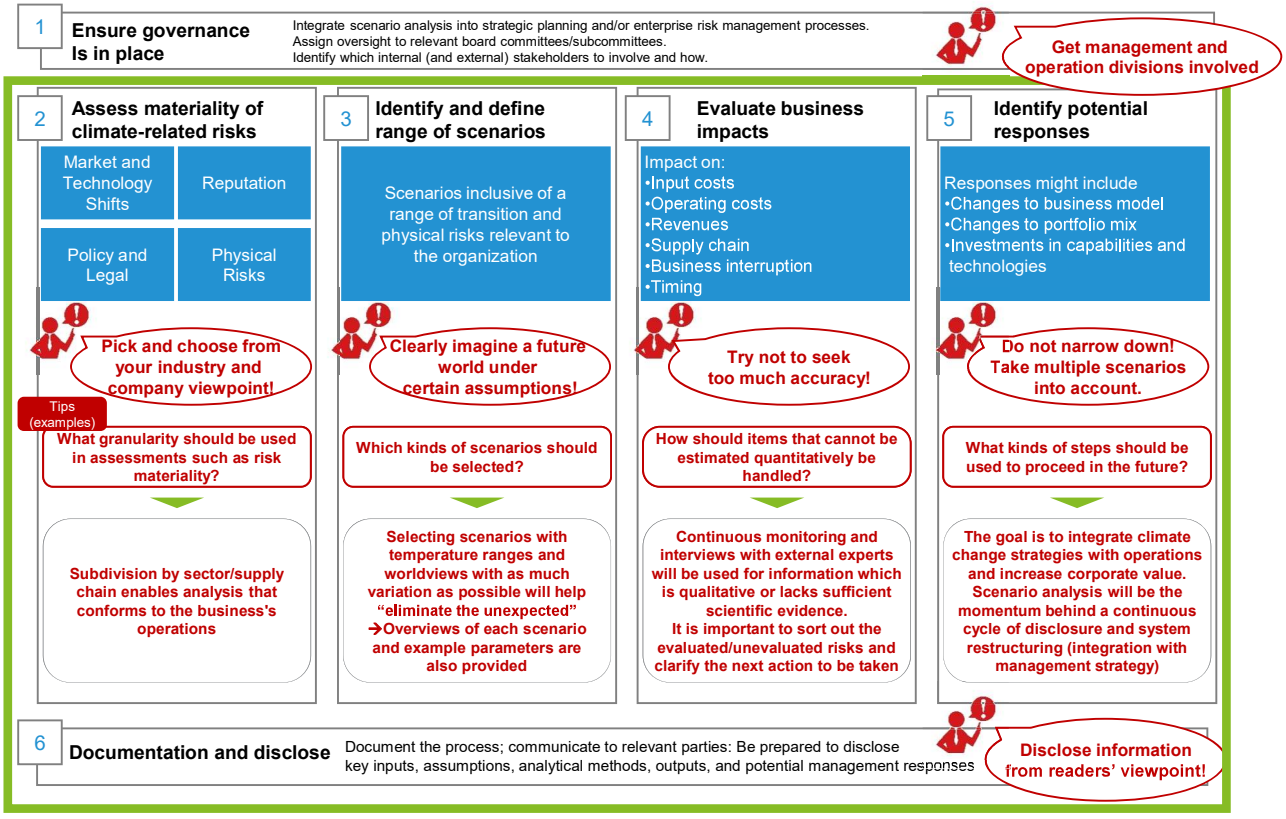
2-5. STEP5. Identify potential responses

2-6. STEP6. Document and disclose information

Chapter 2. Scenario Analysis - Key Points of Practice

This chapter explains how to practically undertake scenario analysis and describes key points of its practice, based on use cases performed by companies under the support program of the Ministry of the Environment.

The TCFD recommendations present 6 steps as a procedure for scenario analysis; we explain these with a focus on STEP2 to STEP6

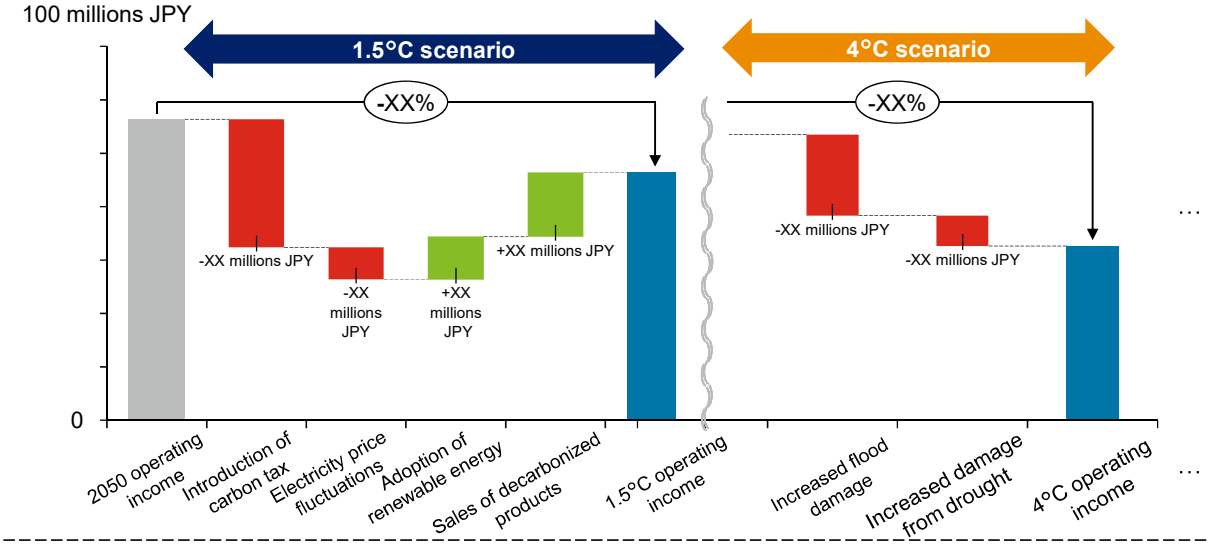


Sources: The Task Force on Climate-related Financial Disclosures, "Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate Related Risks and Opportunities", June 2017.

(Notes in red: Points to consider in each step were added after the support program)

"Scenario analysis" is analysis of the impact of climate change on the company based on a set scenario; by quantifying impact, it can lead to understanding of specific impacts and to effective disclosures

[Scenario analysis: Sample evaluation of impact on business]



Understand the degree of impact climate change will have on the current business outlook trajectory (future management goals/plans)

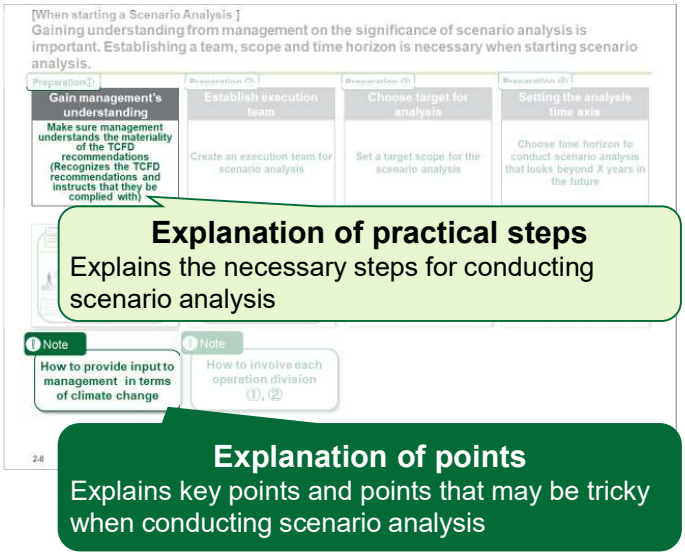
- ✓ Scenario analysis is conducted as a process where **the materiality of climate change risks is evaluated, a set of scenarios are selected, and then the impact on business is evaluated** p2-1
- ✓ Of the various STEPs, **it is particularly important** to use business impact evaluation (STEP 4) to **understand the financial impact of climate change** p2-39 – 2-45
- ✓ **It is a key to take a step-by-step approach** in quantifying financial impacts, such as starting with items that have a significant impact, such as carbon tax p2-3 – 2-5

Page number

[How to View the Key Points of Practice]

We describe scenario analysis procedures and the different levels for companies based on their prior experience with conducting scenario analysis

TCFD scenario analysis procedures



+ Description of the different levels for implementing gradual initiatives based on companies' prior experience

Level	Assumed targets	Direction for "gradual" initiatives
"First time" companies	✓ Companies conducting scenario analysis for the **"first time"** (for example, companies in their first year of scenario analysis)	✓ Sure and steady implementation with awareness of the key points of practice, in line with the direction for "First time" companies ✓ Try starting to implement the "points for continuing companies" as much as possible
Continuing companies	✓ Companies conducting scenario analysis for the **"first time"**, but which are **already working on initiatives related to climate change to some degree** ✓ Companies **that have already implemented scenario analysis** (for example, companies in their second year of scenario analysis)	✓ Move on to the next step of "direction for continuing companies" and use this to increase the sophistication of decarbonized management ✓ Use disclosures and dialogue with investors to enhance analysis and presentation of evidence

[Directions for Scenario Analysis (1/2)]

Scenario analysis should be conducted on an ongoing basis, and built upon gradually

Page number

	For beginning scenario analysis	STEP2 Assess materiality of climate-related risks	STEP3 Identify and define range of scenarios
Direction for "first time" companies	☐ **Internal consensus has been reached** for conducting scenario analysis (management consents) p2-8 – 9 ☐ The **cooperation** of operation divisions has been **obtained** p2-10 – 12 ☐ The **scope/parties responsible (structure)** for scenario analysis have been **identified** p2-10 – 15	☐ Main climate-related risks for the sector and the company **have been identified** p2-18 – 20 ☐ Additionally, the specific impacts from risks **have been hypothesized** p2-20 – 22	☐ Reliable external scenarios **are being used** p2-26 – 33 ☐ Multiple scenarios, including those for 2°C or lower **(currently 1.5°C)**, have been selected (1.5°C, 2.6°C – 4°C) p2-26 – 33 ☐ The worldview for each scenario has been described in detail, and **internal consensus has been reached** P2-34 – 35
Direction for continuing companies	☐ The results of the previous scenario analysis are **understood by management / the heads of the responsible divisions** p2-8 – 9 ☐ Operation divisions are **able to take the lead** in conducting scenario analysis p2-10 – 12 ☐ **The scope / parties responsible (structure)** for scenario analysis **has increased compared to the initial effort** p2-10 – 15	**(Based on dialogue with investors)** ☐ Main climate-related risks for the sector and the company have **been further specified through increasing the involvement of operation divisions and outside experts** p2-18 – 20 ☐ The specific impacts from risks have also **been further specified through increasing the involvement of operation divisions and outside experts** p2-20 – 22	**(Based on dialogue with investors)** ☐ Reliable external scenarios are being used, and **additional scenario information for significant risks have also been supplemented** p2-26 – 33 ☐ Multiple scenarios, **including those for 1.5°C**, have been selected (1.5°C, 2°C, 2.6°C – 4°C) p2-26 – 33 ☐ The worldview for each scenario has been described in detail, and **has also been discussed with outside experts** P2-34 – 35

[Directions for Scenario Analysis (2/2)]

Page number

	STEP4 Evaluate business impacts	STEP5 Identify potential responses	STEP6 Document and disclose information
Direction for "first time" companies	☐ The impact on business from significant risks has been calculated quantitatively **(or qualitatively if the former proves difficult)** even if this is only a trial estimate p2-41 – 44 ☐ The gap between the impact on business and normal results is understood p2-45 ☐ **The operation division agrees** with the method of calculating the impact on business and the resulting figures p2-14 – 15 ☐ In sectors significantly affected by climate change, the impact on business has been calculated with **2030 to 2050 as the target fiscal years** p2-13 – 14 p2-41 – 45	☐ Risks requiring responses have been identified p2-50 ☐ The company's current status in addressing significant risks is understood p2-50 ☐ **Policies for future responses toward** significant risks **have been established** p2-51 ☐ **A rough roadmap** for future response measures / how to proceed after scenario analysis **has been prepared** p2-52	☐ The relationship between TCFD disclosure items and the scenario analysis has been described p2-59 ☐ The results of scenario analysis toward significant risks has been described for each step p2-60 – 65 ☐ The company's response policy to risks has been described p2-60 – 65 ☐ An appropriate disclosure medium has been selected p2-60 – 65
Direction for continuing companies	**(Based on dialogue with investors)** ☐ Trial estimates for quantitative calculation of the impact on business from significant risks has been performed even for **impact that was initially calculated qualitatively** (though qualitative calculation may still be used where this is difficult) p2-41 – 44 ☐ The gap between the impact on business and normal results is understood p2-45 ☐ **Management and outside experts agree** with the method of calculating the impact on business and the resulting figures p2-14 – 15 ☐ In sectors significantly affected by climate change, the impact on business has been calculated with **2030 to 2050 as the target fiscal years** p2-13 – 14 p2-41 – 45	**(Based on dialogue with investors)** ☐ Risks requiring responses have been identified p2-50 ☐ The company's current status in addressing significant risks is understood p2-50 ☐ **Specific initiatives for future responses toward** significant risks **have been established** p2-51 ☐ **A roadmap and organizational structure** for future response measures / **scenario analysis has been established** p2-52	**(Based on dialogue with investors)** ☐ The relationship between TCFD disclosure items and scenario analysis has been described p2-59 ☐ The results of scenario analysis toward significant risks has been described **in as quantitative a manner as possible** for each step p2-60 – 65 ☐ The company's response policy to risks and **specific initiatives** have been described p2-60 – 65 ☐ An appropriate disclosure medium has been selected p2-60 – 65

2. Scenario Analysis - Key Points of Practice

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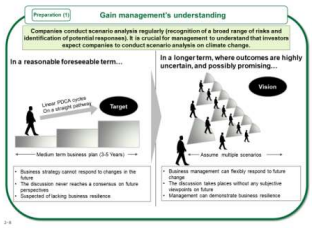
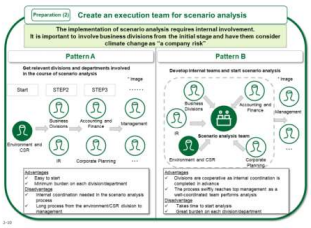
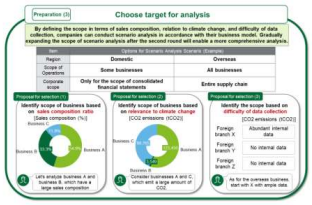
[When starting a Scenario Analysis]

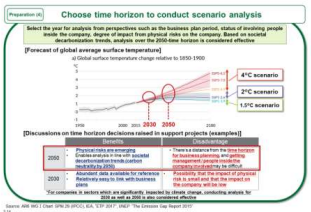
Gaining understanding from management on the significance of scenario analysis is important. Establishing a team, scope and time horizon is necessary when starting scenario analysis

Preparation (1)	Preparation (2)	Preparation (3)	Preparation (4)
Gain management's understanding	**Establish execution team**	**Choose target for analysis**	**Setting the analysis time axis**
Make sure management understands the materiality of the TCFD recommendations (Recognizes the TCFD recommendations and instructs that they be complied with)	Create an execution team for scenario analysis	Set a target scope for the scenario analysis	Choose time horizon to conduct scenario analysis that looks beyond X years in the future









Note

How to provide input to management in terms of climate change

Note

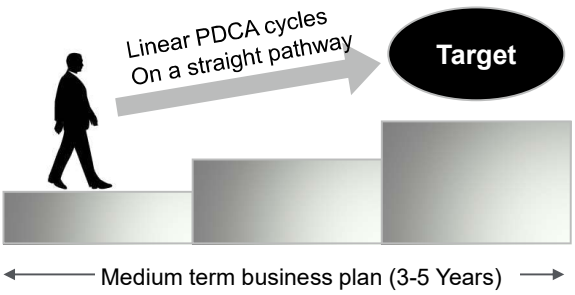
How to involve each operation division (1), (2)

Preparation (1)

Gain management's understanding

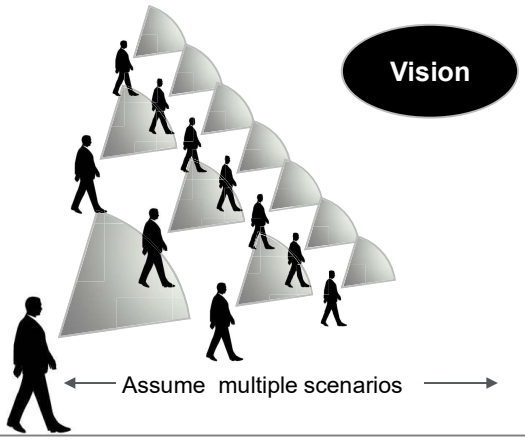
Companies conduct scenario analysis regularly (recognition of a broad range of risks and identification of potential responses). It is crucial for management to understand that investors expect companies to conduct scenario analysis on climate change.

In a reasonable foreseeable term…



- Business strategy cannot respond to changes in the future
- The discussion never reaches a consensus on future perspectives
- Suspected of lacking business resilience

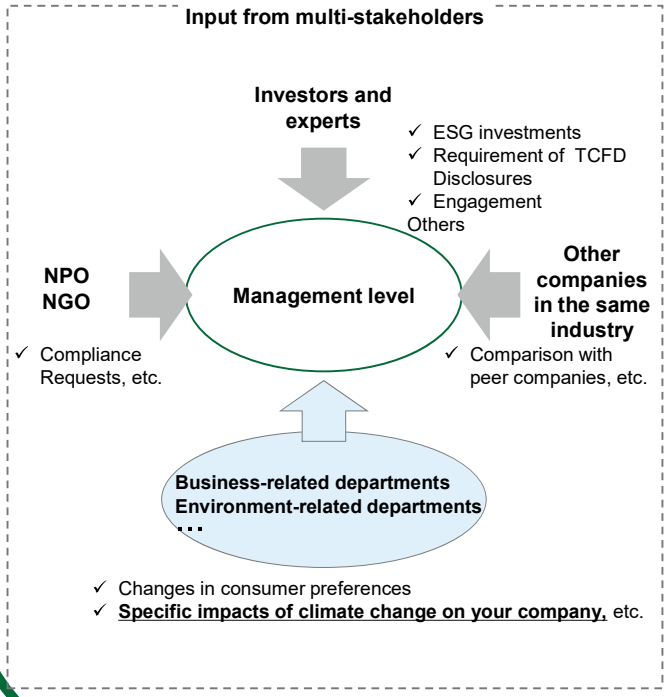
In a longer term, where outcomes are highly uncertain, and possibly promising…



- Business management can flexibly respond to future change
- The discussion takes places without any subjective viewpoints on future
- Management can demonstrate business resilience

How to provide input to management in terms of climate change

It is effective to convey the effect that climate change solutions have on the value of businesses through workshops with experts.



- There are increasingly frequent requests from multi-stakeholders for responses to climate change. While there are cases where management hears about these trends directly, there are also cases where those messages don't reach management.
- In such a case, it is important to compile **the status of requests from multi-stakeholders**, and input to management **through study groups with experts and other means that responding to climate change can affect corporate value**.
- Continuing to input the results of climate change-related scenario analysis from the second round and after onward will further deepen management's understanding of the specific opportunities/risks related to climate change for the company.

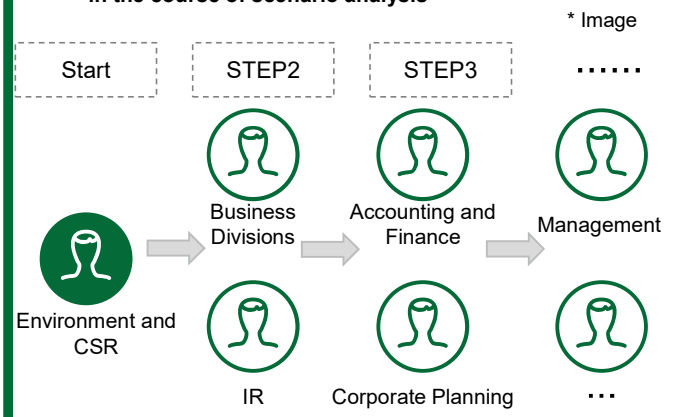
Preparation (2)

Create an execution team for scenario analysis

**The implementation of scenario analysis requires internal involvement.
It is important to involve business divisions from the initial stage and have them consider climate change as "a company risk"**

Pattern A

Get relevant divisions and departments involved in the course of scenario analysis

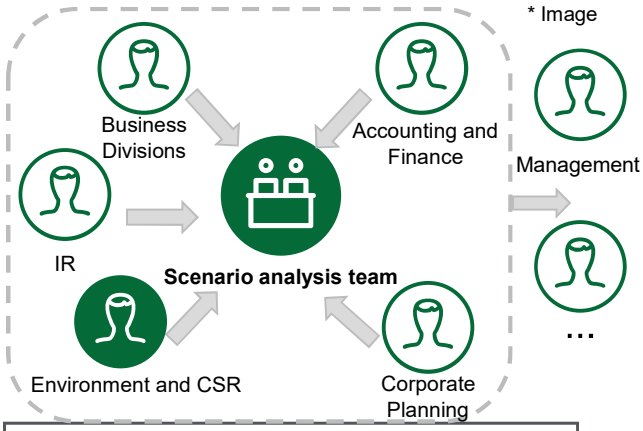


Advantages
- ✓ Easy to start
- ✓ Minimum burden on each division/department

Disadvantage
- ✓ Internal coordination needed in the scenario analysis process
- ✓ Long process from the environment/CSR division to management

Pattern B

Develop internal teams and start scenario analysis



Advantages
- ✓ Divisions are cooperative as internal coordination is completed in advance
- ✓ The process swiftly reaches top management as a well-coordinated team performs analysis

Disadvantage
- ✓ Takes time to start analysis
- ✓ Great burden on each division/department

How to involve each operation division (1)

**The following use cases exist as examples for involving operation divisions for companies that have implemented scenario analysis.
Effectively leveraging management's commitment and using narratives suited to each division/department are useful strategies, and daily communication of information within the company will also help promote understanding.**

Narratives for each operation division

- It may be good to put the focus on **how the company as a whole can reduce its CO2 emissions through the contributions of various areas such as products and procurement,** rather than concentrating only on reducing emissions from processes. Framing it in such a way could promote greater participation from each operation division.
- Since each operation division is connected, **we can motivate them by having each operation division consider strategies they can implement and come up with a storyline** for what to do. The important thing is **showing what they can do as a business**, and not being limited to environmental measures.

Effectively leveraging management's commitment

- We communicate with operation divisions in the following manner: "we are planning to discuss the results we reviewed based on external data at the management committee, **so if there is anything that you as a division think should be corrected, please let us know**".
- The backing of **management's commitment** allows us to use the momentum to involve operation divisions

- There are many other issues besides climate change, and some might argue that those issues should be addressed first. However, we emphasize that **there is a need for us to focus on measures against climate change, as this is something that is required of us as a company**.
- Having **management position climate change measures as a priority issue** enables us to gain operation divisions' understanding that this is an important issue for the company.

Strengthening communication of information within the company

- We started **communicating information within the company** about the TCFD recommendations from the beginning stage of their implementation, so there was no sense of resistance internally as our staff was already aware of them.
- **When it became time to proceed with the scenario analysis, each division responded quickly by assigning members to the scenario analysis team.**

How to involve each operation division (2)

Operation divisions should also take the lead and be involved in the scenario analysis process.
In the initial stages, it is assumed that operation divisions will provide interviews/data regarding the analysis results from ESG/sustainability-related departments.

	Structure for conducting scenario analysis	How operation divisions are involved	Positions in the operation division that are involved
Companies undertaking scenario analysis for the first time	✓ Departments or other units responsible for ESG/sustainability will take the lead in conducting scenario analysis and interviews with operation divisions	✓ Provide data to those conducting scenario analysis ✓ Provide feedback on analysis results (for analysis conducted by other divisions)	✓ Not specified ✓ However, the responsible parties within the operation division should understand the significance and overview of scenario analysis
Companies continuing to conduct scenario analysis	✓ ESG/sustainability-related departments perform a secretarial role ✓ Operation divisions conduct scenario analysis/intra-divisional interviews	✓ Provide data to those conducting scenario analysis ✓ Conduct scenario analysis for related target areas ✓ Intra-divisional interviews	✓ Positions closest to decision making processes should be involved, as it will be necessary to involve operation division members in tasks such as data collection and promoting countermeasures

Preparation (3)

Choose target for analysis

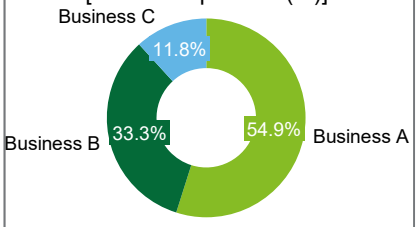
By defining the scope in terms of sales composition, relation to climate change, and difficulty of data collection, companies can conduct scenario analysis in accordance with their business model. Gradually expanding the scope of scenario analysis after the second round will enable a more comprehensive analysis.

Item	Options for Scenario Analysis Scenario (Example)	
Region	**Domestic**	**Overseas**
Scope of Operations	**Some businesses**	**All businesses**
Corporate scope	**Only for the scope of consolidated financial statements**	**Entire supply chain**

Proposal for selection (1)

Identify scope of business based on sales composition ratio

[Sales composition (%)]

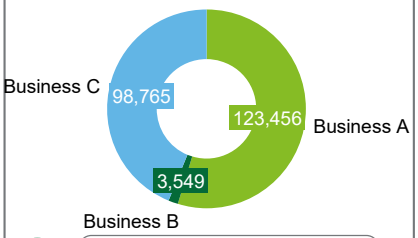


Let's analyze business A and business B, which have a large sales composition

Proposal for selection (2)

Identify scope of business based on relevance to climate change

[CO2 emissions (tCO2)]



Consider businesses A and C, which emit a large amount of CO2.

Proposal for selection (3)

Identify the scope based on difficulty of data collection

	[CO2 emissions (tCO2)]
Foreign branch X	Abundant internal data
Foreign branch Y	No internal data
Foreign branch Z	No internal data

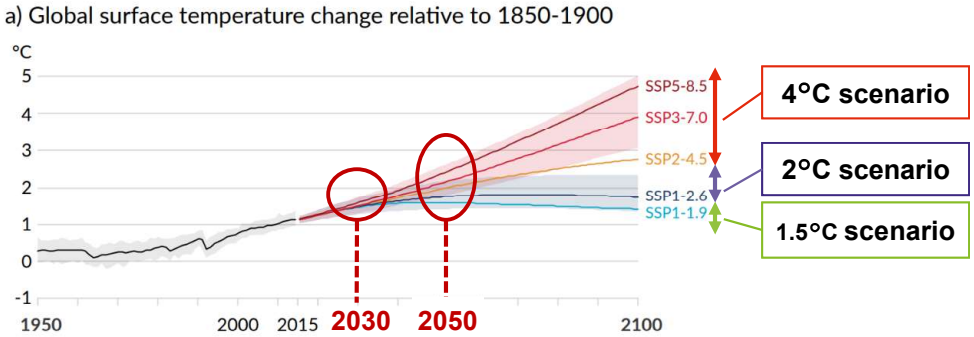
As for the overseas business, start with X with ample data.

Preparation (4)

Choose time horizon to conduct scenario analysis

Select the year for analysis from perspectives such as the business plan period, status of involving people inside the company, degree of impact from physical risks on the company. Based on societal decarbonization trends, analysis over the 2050-time horizon is considered effective

[Forecast of global average surface temperature]



[Discussions on time horizon decisions raised in support projects (examples)]

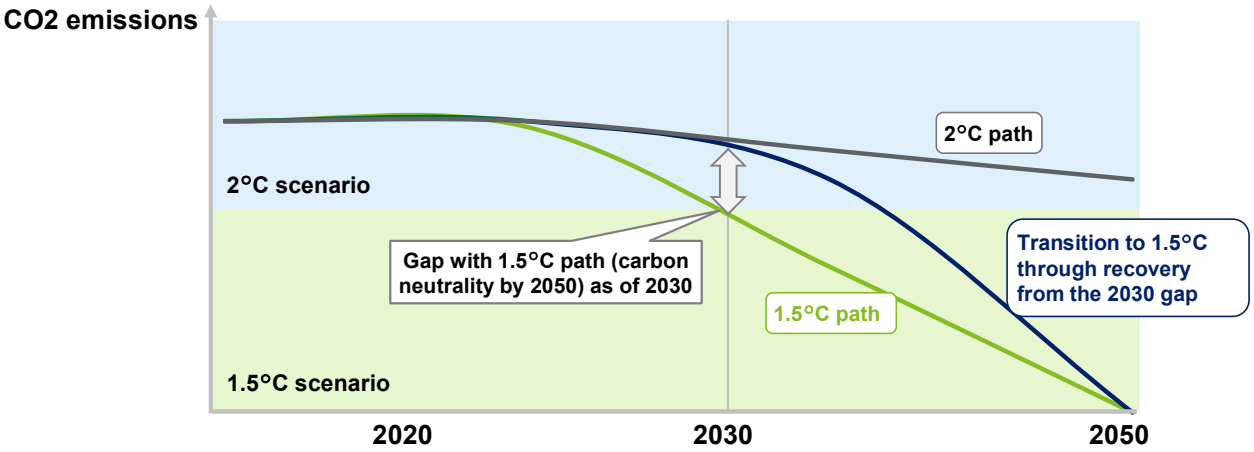
	Benefits	Disadvantage
2050	• Physical risks are emerging • Enables analysis in line with societal decarbonization trends (carbon neutrality by 2050)	• There's a distance from the time horizon for business planning, and getting management / people inside the company involved may be difficult
2030	• Abundant data available for reference • Relatively easy to link with business plans	• Possibility that the impact of physical risk is small and that the impact on the company will be low

***For companies in sectors which are significantly impacted by climate change, conducting analysis for 2030 as well as 2050 is also considered effective**

Source: AR6 WG I Chart SPM.29 (IPCC), IEA, "ETP 2017", UNEP "The Emission Gap Report 2015"

Considering a plan for transitioning to decarbonization

In sectors where climate change has a significant impact, scenario analysis for the target year 2030 in addition to 2050 can be useful to examine the mid- to long-term "transition to decarbonization" for carbon neutrality by 2050.
The transition path toward 2050 may not necessarily follow the 1.5°C path



The following points should be considered when investigating the transition toward decarbonization for carbon neutrality by 2050:

- ✓ **Is there a significant financial impact in the 1.5°C scenario as of 2030? (i.e., is there a gap between the 1.5°C path and the company's own path?)**
- ✓ **If there is a significant financial impact, how will the company recover from it? (investing in technologies, building more low-energy facilities, etc.)**

Furthermore, there are many things to consider when determining a transition plan (the company's starting position and track record, capital investment timing, etc.), so short and medium-term targets (e.g., for 2030) may not necessarily be on the same linear axis as long-term targets (2050), and also the path may not even be linear

 Source: Financial Services Agency, Ministry of Economy, Trade and Industry, Ministry of the Environment, "Basic Guidelines on Climate Transition Finance" (2021)

2. Scenario Analysis - Key Points of Practice

Scenario Analysis Guide - Key Points of Practice

2-1. For beginning scenario analysis

2-2. STEP2. Assess materiality of climate-related risks

2-3. STEP3. Identify and define range of scenarios

2-4. STEP4. Evaluate business impacts

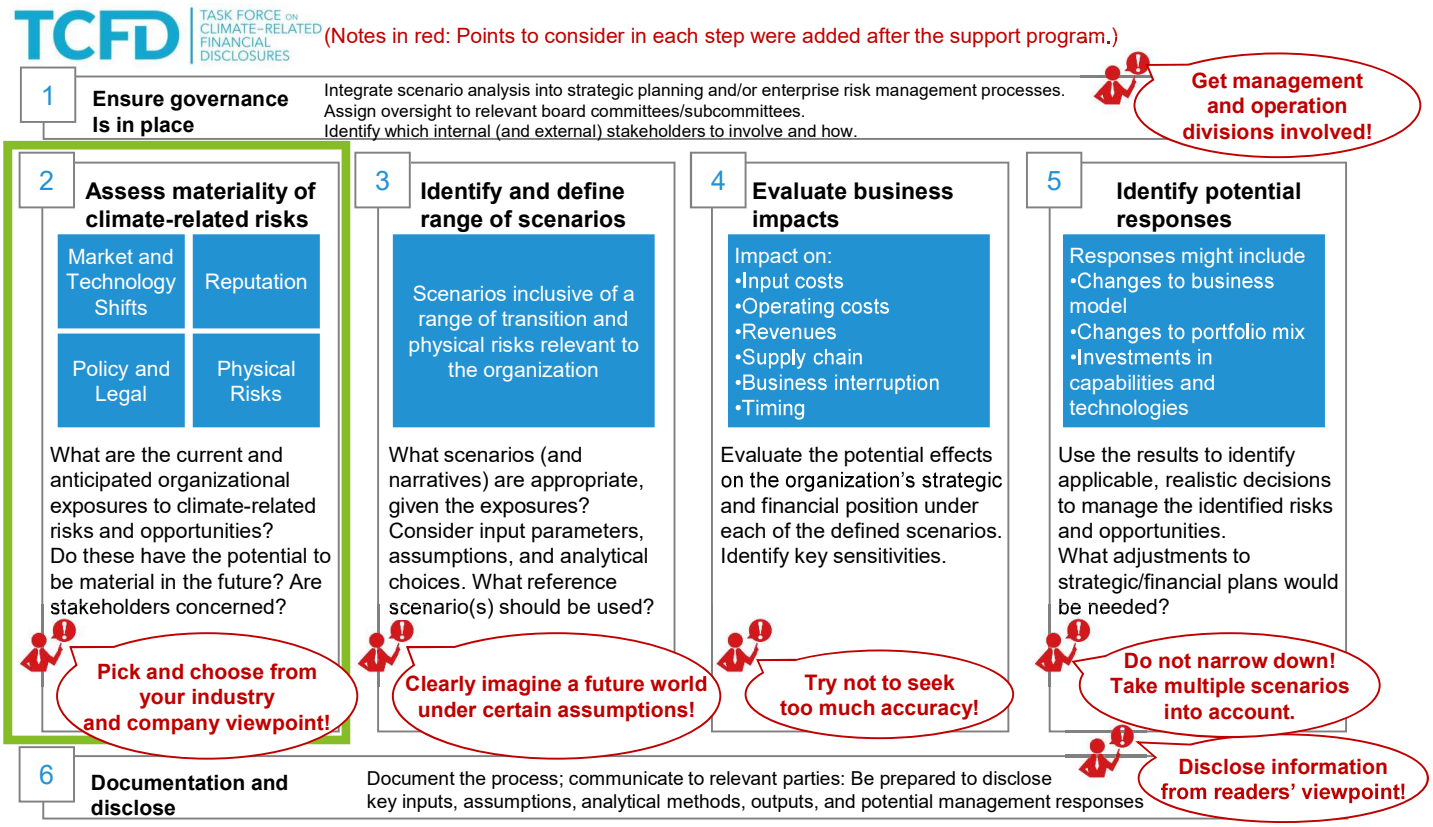
2-5. STEP5. Identify potential responses

2-6. STEP6. Document and disclose information

Chapter 2 Scenario Analysis - Key Points of Practice

This chapter explains how to practically undertake scenario analysis and describes key points of its practice, based on use cases performed by companies under the support program of the Ministry of the Environment.

Assess materiality of climate-related risks:
What are the current and anticipated organizational exposures to climate-related risks and opportunities?



Sources: The Task Force on Climate-related Financial Disclosures, "Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate Related Risks and Opportunities", June 2017.

[Overview]

List risk items, identify the potential impacts on business, and assess materiality of climate-related risks

Stage1 — **List risk items**

List the risks and opportunities related to targeted business areas

Stage2 — **Identify potential impacts on business**

From the list of risk and opportunities, qualitatively describe the potential impact on business

Stage3 — **Assess the materiality of climate-related risks**

Conduct risk assessment based on scale of impact (large to small) and determine how important it is

Image

Transition risk classification	Index	Business Impact: Discussion: Risks	Business Impact: Discussion: Opportunities	Assessment
Carbon emission targets/policies of each country (Carbon tax)	Spending	➢ Plant operating costs may increase due to the application of carbon taxes by governments of various countries	➢ Quick responses such as shifting to use low-carbon energy could make it possible to limit energy cost increases	Large
Carbon emission targets/policies of each country	Spending	➢ Production costs may rise due to rising costs of raw materials	➢ Quick responses to anticipated future regulations could make it possible to limit production cost increases	Large
Changes in the energy mix	Spending	➢ Electricity fees may rise and manufacturing costs may increase due to higher rates of reusable energy ➢ Costs may increase due to significant reductions in CO2 emissions for manufacturing plants	➢ Expanding investment and increasing the use of renewable energy may lead to greater revenue from enhanced production capability	Large
Changes in important products/prices	Revenue Spending	➢ Production costs of key products may rise due to requirements to display the carbon footprint of manufactured products, including in the textile industry	➢ Options may increase for new materials, new products, and new services adapted to a circular economy, resulting in increased sales	Large
Changes in customer behavior	Revenue Spending	➢ As more consumers and stakeholders make purchasing decisions based on environmental impact, delayed action may lead to loss of customers and decreased sales ➢ There is a risk of increased costs for presentation of risks such as use of hazardous substances and supply chain risks	➢ By responding to changes in purchasing trends and expanding its line of environmentally friendly products, such as functional clothing that uses less energy and products utilizing recycled materials, GUNZE can maintain its market superiority and connect these to increased revenue	Large
Changes in investor's reputation	Revenue	➢ Failing to keep pace with the apparel industry's standard-setting for energy, water, and material use may lead to increased costs for addressing potential reputation damage and decreased sales	➢ Meeting sustainability requirements could lead to deeper relationships with customers, employees, regulators, and interest groups, which could lead to increased revenue	Medium

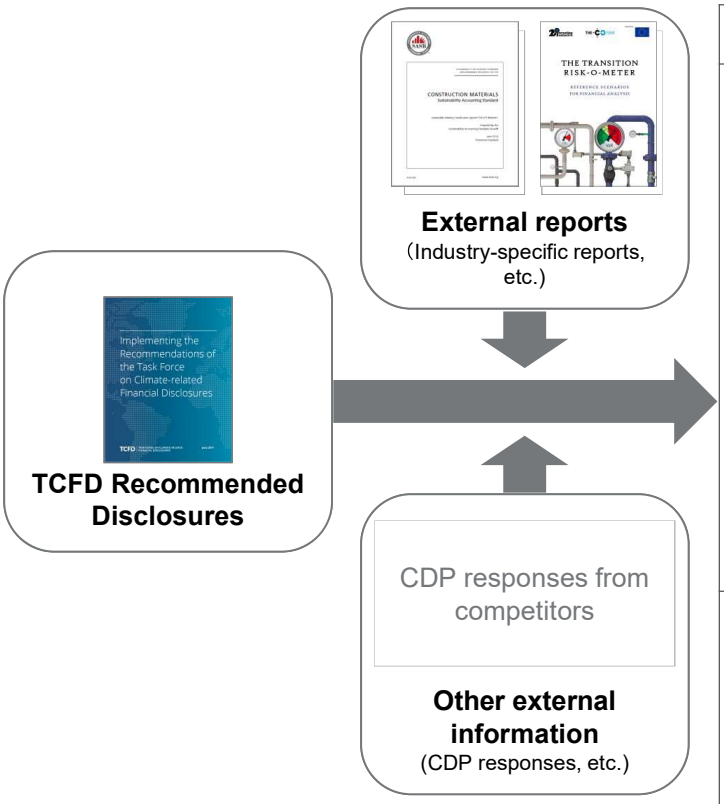
Note

To what extent should the risk assessment be conducted?

Source: This Practical Guide (example of GUNZE: 3-69)

[Stage 1: List risk items]

List risk and opportunity categories for targeted business areas



Image

Classification		Risks and Opportunities Related to Climate Change (Examples)
Transition Risk / Opportunity	Policy Regulation	Carbon price
		Carbon emissions targets/policies of each country
		Energy-saving policy
		Fossil fuel subsidies
		Subsidies for renewable energy, etc.
	Market	Changes in the energy mix
		Changes in energy demand
		Changes in important products/prices
	Technologies	Diffusion of renewable energy and energy-saving technologies
	Reputation	Changes in customer reputation
		Changes in investor's reputation
Physical Risk / Opportunity	Chronic	Increase in average temperature
		Changes in rainfall and weather patterns
		Rising sea level
	Acute	Increasing severity of extreme weather conditions

[Stage 2: Identify potential impacts on business]

From the list of risk and opportunity items, qualitatively describe the potential impact on business

Image

		Business Impact		
		Discussion: Risks	Discussion: Opportunities	
Carbon emission targets/policies of each country (Carbon tax)	Spending	Plant operating costs may increase due to the application of carbon taxes by governments of various countries	Quick responses such as shifting to use low-carbon energy could make it possible to limit energy cost increases	Large
Carbon emission targets/policies of each country	Spending	Production costs may rise due to rising costs of raw materials	Quick responses to anticipated future regulations could make it possible to limit production cost increases	Large
Changes in the energy mix	Spending	Electricity fees may rise and manufacturing costs may increase due to higher rates of reusable energy Costs may increase due to significant reductions in CO2 emissions for manufacturing plants	Expanding investment and increasing the use of renewable energy may lead to greater revenue from enhanced production capability	Large
Changes in important products/prices	Revenue Spending	Production costs of key products may rise due to requirements to display the carbon footprint of manufactured products, including in the textile industry	Options may increase for new materials, new products, and new services adapted to a circular economy, resulting in increased sales	Large
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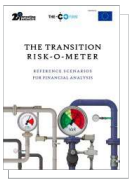
It is important to consider not only the company's risks but also its opportunities.

Separate and examine risks and opportunities



CDP responses from competitors

External reports and other external information

Describe the possible impact in a narrative manner through discussions with related parties within the company, based on the company's business model, etc. If the analysis is to be conducted in the second round, it may be a good idea to include external stakeholders in the discussion.

Discussions with internal stakeholders

Source: This Practical Guide (example of GUNZE: 3-69)

[Stage3: Materiality assessment of climate-related risks]

Conduct risk assessment based on scale of impact (large to small)

Business impact	Risks and opportunities tied to business impact	
Large	• Carbon price • Changes in important products/prices	• Policies and regulations of each country • Changes in rainfall and weather conditions
Medium	• Changes in the energy mix • Changes in the reputation of customers and investors	
Small	• Energy-saving policy • Fossil fuel subsidies • Subsidies for renewable energy, etc. • Energy demand • Improving efficiency	• Diffusion of renewable/energy-saving technologies • Rising sea levels • Increasing in severity of extreme weather conditions

Image

Comparison of each risk and opportunity item from the perspective of **the size of the business impact** for the company

Example: **Describe risks and opportunities that impact in a wide range, and those that relate to important goods as "Large." Describe those that have no impact on one's business as "Small" and "Medium" for others**.

Examples of Analysis (Changes in Important Products)

Since raw materials account for a large proportion of the cost of sales, the business impact may be "large."

To what extent should the risk assessment be conducted?

Assessing materiality of risks after categorizing them by differences in products (by sector) and affected supply chains (by supply chain) enables an analysis that is convincing to management

Example (1)

Materiality assessment of risks by sector

Image

Risk Item	Materiality assessment of risks by sector		
	X	Y	Z
Risk A	Large	Medium	Small
Risk B	Small	Small	Large
Opportunity C	Large	Medium	Medium
Opportunity D	Medium	Large	Large

Example (2)

Materiality assessment of risks by supply chain

Image

Risk Item	Materiality assessment of risks by supply Chain			
	Procurement	Transportation	Sales	・・・
Risk A	Large	Large	Small	Medium
Risk B	Small	Small	Large	Large
Opportunity C	Large	Medium	Medium	Small
Opportunity D	Medium	Large	Large	Large

2. Scenario Analysis - Key Points of Practice

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Chapter 2 Scenario Analysis - Key Points of Practice

This chapter explains how to practically undertake scenario analysis and describes key points of its practice, based on use cases performed by companies under the support program of the Ministry of the Environment.

Identify and define range of scenarios:
What scenarios (and narratives) are appropriate, given the exposures?

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

(Notes in red: Points to consider in each step were added after the support program.)

1 Ensure governance Is in place

Integrate scenario analysis into strategic planning and/or enterprise risk management processes.
Assign oversight to relevant board committees/subcommittees.
Identify which internal (and external) stakeholders to involve and how.

Get management and operation divisions involved!

2 Assess materiality of climate-related risks

- Market and Technology Shifts
- Reputation
- Policy and Legal
- Physical Risks

What are the current and anticipated organizational exposures to climate-related risks and opportunities?
Do these have the potential to be material in the future? Are stakeholders concerned?

Pick and choose from your industry and company viewpoint!

3 Identify and define range of scenarios

Scenarios inclusive of a range of transition and physical risks relevant to the organization

What scenarios (and narratives) are appropriate, given the exposures?
Consider input parameters, assumptions, and analytical choices. What reference scenario(s) should be used?

Clearly imagine a future world under certain assumptions!

4 Evaluate business impacts

Impact on:
- Input costs
- Operating costs
- Revenues
- Supply chain
- Business interruption
- Timing

Evaluate the potential effects on the organization's strategic and financial position under each of the defined scenarios.
Identify key sensitivities.

Try not to seek too much accuracy!

5 Identify potential responses

Responses might include
- Changes to business model
- Changes to portfolio mix
- Investments in capabilities and technologies

Use the results to identify applicable, realistic decisions to manage the identified risks and opportunities.
What adjustments to strategic/financial plans would be needed?

Do not narrow down! Take multiple scenarios into account.

6 Documentation and disclose

Document the process; communicate to relevant parties: Be prepared to disclose key inputs, assumptions, analytical methods, outputs, and potential management responses

Disclose information from readers' viewpoint!

Sources: The Task Force on Climate-related Financial Disclosures, "Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate Related Risks and Opportunities", June 2017.

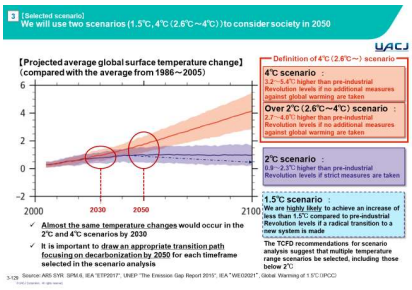
[Overview]

Choose scenarios, obtain forecast information on parameters, and shape the worldview

Stage 1

Choose scenarios

Choose a number of scenarios with different temperature targets, including the below 2°C (1.5°C).



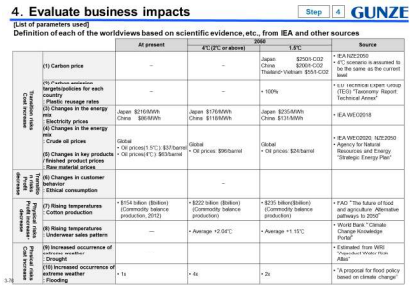
Note

What kind of scenarios should be chosen?

Stage 2

Obtain forecast information on relevant parameters (variables)

Obtain objective forecast information of relevant parameters on each risk and opportunity items and identify the effects to the company in further detail.



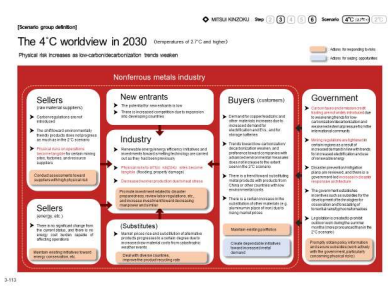
Note

What kind of scenario is the 1.5℃ scenario? Parameter Example (1) (2)

Stage 3

Shape the worldview in consideration of stakeholders

Based on forecast information, shape the company's worldview such as future stakeholders' performance, and work towards achieving internal and external consensus by incorporating the perspectives from outside of company (If needed).



Note

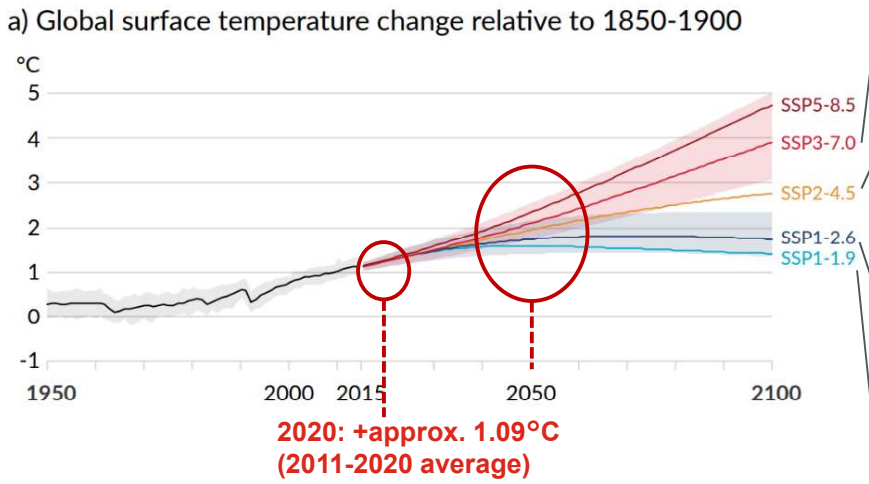
How to coordinate the worldview with each business division?

Sources: This Practical Guide (UACJ example: 3-129, GUNZE example: 3-76, Mitsui Mining & Smelting example: 3-113)

[Stage1: Choose scenarios]

We will select scenarios from multiple temperature ranges, including the below 2ºC (1.5°C) scenario, in order to respond to an uncertain future

[Predicted global surface temperature change]
(Difference with the 1850 – 1900 average)



SSP3-7.9: +2.8 – 4.6°C (approx. 3.6°C)
Mid- to high level reference scenario in which climate countermeasures are not adopted due to confrontational stances toward development between different regions
Large volume of emissions besides CO2, such as aerosols

SSP2-4.5: +2.1 – 3.5°C (approx. 2.7°C)
Climate countermeasures are adopted, and development is neutral. Emission levels are largely on par with the upper limit of aggregated "Nationally Determined Contributions (NDCs)" for each country. The temperature increase compared to pre-industrial levels by the end of the 21st century is approx. 2.7°C (best estimate)

SSP1-2.6: +1.3 – 2.4°C (approx. 1.8°C)
There is sustainable development, and climate countermeasures are adopted to keep the temperature increase to below 2°C compared to pre-industrial levels. Net zero CO2 emissions is expected to be achieved by the latter half of the 21st century

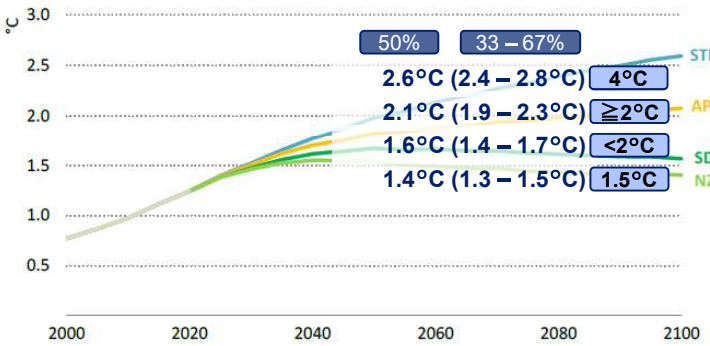
SSP1-1.9: +1.0 – 1.8°C (1.4°C)
There is sustainable development, and climate countermeasures are adopted to keep the increase in temperature (median value) by the end of the 21st century mostly to approx. 1.5°C (there may be cases where it exceeds it slightly) or below compared to pre-industrial levels. Net zero CO2 emissions is expected to be achieved by the mid-21st century

- ✓ **Up to 2030, the 2°C and 4°C scenarios have mostly the same level of temperature change. Starting in 2030, the gap between the scenarios widens**
- ✓ **The equilibrium climate sensitivity (ECS) for 2100 has a likely range of 2.5 – 4°C and a very likely range of 2 – 5°C, and a median value of 3°C**
- ✓ **If current trends continue, global warming will exceed 1.5°C and 2°C within the 21st century if emissions of CO2 and other greenhouse gases are not significantly reduced within the next few decades**

Source: AR6 WG I Figure SPM.29 (IPCC), Ministry of the Environment

(Reference) The IEA's WEO 2021 newly released detailed parameters for the latest scenarios: the NZE (1.5°C), and the APS (2.1°C)

Global surface temperature increase (median value) over time for each scenario in the WEO 2021



*In the temperature blocks, we have listed the maximum temperature increases for confidence levels of 50% and 33% – 67%

Assumptions

- ✓ **Around 2050, temperatures increased will reach a peak of 1.7°C in the SDS and 1.5°C in the NZE before declining**
- ✓ **The 2100 increase in temperature will be 2.6°C in STEPS and 2.1°C in APS, and will continue to rise after that**
- ✓ In contrast to the WEO 2020, assumptions about public health have not been changed for each scenario; the WEO 2021 assumes that the pandemic will largely die down by the end of 2021 in developed countries and China, but will continue longer in many emerging markets and developing countries

The Stated Policies Scenario (STEPS) — Exploratory
- ✓ A scenario that does not assume that each government will meet its announced targets; serves as a conservative benchmark for exploring the direction for energy systems in the absence of significant steering by policymakers

The Announced Pledges Scenario (APS) — Exploratory
- ✓ First appearance in the WEO
- ✓ Considers all climate change pledges made by governments around the world, including NDCs and long-term net zero targets, and assumes that they will be met completely and on time

Sustainable Development Scenario (SDS) — Exploratory
- ✓ Rapid increase in clean energy policies and investment
- ✓ Net zero will be reached by 2050 for developed countries, around 2060 for China, and by 2070 at the latest by other countries

The Net Zero Emissions by 2050 Scenario (NZE) — Normative
- ✓ Rapid increase in clean energy policies and investment
- ✓ Developed countries will reach net zero ahead of other countries
- ✓ Energy access and air quality will improve by 2030

→See Appendix for examples of parameters

Source: IEA "World Energy Outlook 2021"

Which scenario should be chosen?

Selecting scenarios with temperature ranges and worldviews with as much variation as possible will help "eliminate the unexpected". It is important to consider the characteristics and parameters of each scenario and choose a scenario that matches the company's industry and situation, investor trends, and trends for domestic and international policies. It will also be effective to consider scenarios based on recent decarbonization trends (currently 1.5°C)

Scenario /temperature range	IEA WEO (World Energy Outlook)	SSP (Shared Socioeconomic Pathways)					PRI IPR (Inevitable Policy Response)
	• Lists medium- to long-term energy market forecasts ✓ Lists future information (quantitative/qualitative) related to energy	• Socioeconomic scenario based on recent policies and the socioeconomic environment ✓Lists the macroeconomic information scenarios are based on for each scenario					• Scenario for climate-related policies that are likely to be implemented in the short term ✓Lists qualitative and quantitative forecasts for climate-related policies
		SSP1	SSP2	SSP3	SSP4	SSP5	
RCP8.5 (4°C)	CPS (Current Policies, eliminated in '20)	—	—	—	—	○	—
RCP6.0	—	○	○	○	○	○	—
RCP4.5	STEPS (2.6°C, Stated Policies)	○	○	○	○	○	—
RCP3.4	—	○	○	○	○	○	—
RCP2.6	APS (2.1°C, Announced Pledges, added in '21) SDS (1.6°C, Sustainable Development)	○	○	○	—	△ Partial achievement	FPS (1.8°C, Forecast Policy Scenario)
RCP1.9 (under 1.5°C)	NZE (1.4°C, Net Zero Emissions by 2050)	○	—	—	—	—	RPS (1.5°C Required Policy Scenario)

*RCP stands for Representative Concentration Pathways. The subsequent values are the radiative forcing values (for example, RCP 2.6 indicates a radiative forcing increase of 2.6W/m2 by the end of the 21st century compared to pre-industrial levels)

✓: Climate models corresponding to RCPs exist
(✓) Some portions lacking models

Sources: IEA website, Riahi et al. (2017) https://doi.org/10.1016/j.gloenvcha.2016.05.009, PRI website

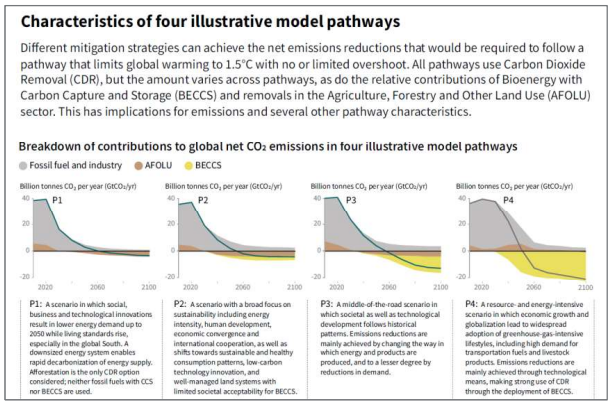
What kind of scenario is the 1.5˚C scenario?

The Paris Agreement indicated that efforts will be pursued to keep the global average temperature increase well below 2˚C and to keep it at 1.5˚C compared to pre-industrial levels.
In October 2018, the Intergovernmental Panel on Climate Change (IPCC) prepared a special report on the effects of a 1.5˚C global warming and the pathways through which it can emit greenhouse gases.

Impact difference between 2˚C and 1.5˚C scenario (Examples)

	1.5° C scenario	2° C scenario
Sea level rise by 2100	Rise of 26 – 77cm	Rise of 30 – 93cm
Biological species loss	Insects : 6% decrease Plants : 8% decrease Vertebrates : 4% decrease	Insects:18% decrease Plants:16% decrease Vertebrates:8% decrease
Disappearance frequency of sea ice in the Arctic Ocean during summer	Once in 100 years	Once in 10 years
Decrease ratio of catches	1.5 million tons	3.0 million tons
Impacts on coral reef	Approximately 70% – 90% dies	Mostly annihilated

Greenhouse gas emissions pathways to 1.5˚C



- Examples of 4 representative pathways (P1 to P4) are listed.
  - **P1: Low energy demand. No use of CCS**
  - **P2: Wide focus on sustainability**
  - **P3: Middle of the road scenario (business as usual)**
  - **P4: Expected use of CCS**

Source: Global Warming of 1.5℃ (IPCC)

[Step 2: Obtain forecast information on parameters (variables)]

Obtain forecast information on parameters and identify the effects to the company in further detail

List of Risks and Opportunities

Image

【Step2：Significance assessment of risks/opportunities】

Climate-related risks and opportunities in Nishitetsu Group's bus business

Type			Evaluation	Risks	Opportunities
Transition Risk	Policy	Carbon tax	Large	-Increased costs due to introduction of a carbon tax	-Decreased fuel procurement costs due to introduction of EV buses, etc.
		Regulations	Large	-Costs incurred for addressing demands to transition to EV buses, etc. -Difficult to continue business if these cannot be addressed	-Preemptive investment/introduction made possible through implementation/strengthening of policies and subsidy programs to promote the spread of EV buses
	Technologies	Spread of low-carbon technologies	Large	-Increased procurement costs for EV buses, etc. -Increased operation costs such as storage battery management costs and replacement costs -Increased maintenance costs for EV buses, etc. -Increased hard infrastructure construction costs for fueling facilities, etc.	-Lower prices for EV buses, etc., and the capacity to travel long distances lead to lowered vehicle procurement costs and barriers toward introduction -Reduced fuel procurement costs due to improved fuel efficiency from lighter vehicles -Increased sales due to the introduction of mixed passenger-cargo transportation -Revenue source secured through leveraging storage battery for energy management, etc.
		Development of next-generation technologies	Large	-Costs incurred for introducing automated driving technology -Increased maintenance costs for automated vehicle fleet	-Reduced costs from the spread of automated driving technology curbing fuel and personnel needs -Increased sales due to active use of public transportation due to the spread of MaaS and AI on-demand services, etc.

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Parameters list

Image

【Step3：Identify and define range of scenarios】

Definitions of various worldviews based on scientific evidence from IEA and other sources

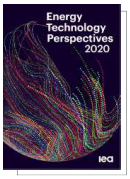
*Exchange rate: 1 USD = 110 JPY (based on the Sept. 1, 2021 rate)
*Items in blue are items for which 2℃ parameters were used due to the 1.5℃ parameters not being available

Key items	Assumed parameter	Parameter area	Unit	BAU	2030 4℃	2030 1.5℃	2050 4℃	2050 1.5℃	Source
Carbon emissions targets/policies in each country	Carbon tax (Carbon border adjustment mechanism)	Developed countries	Yen/tCO2	-	-	14,300	-	27,500	• IEA WEO2020 • IEA NZE2050 • 4℃ scenario is assumed to be the same as the current level
	Spread of environmentally friendly vehicles (EV/FC buses)	World	%	-	2%	23%	6%	79%	• IEA WEO2020 • IEA NZE2050
Changes in the energy mix	Percentage change in price of fuel	World	%	-	21%	-5%	48%	-35%	• IEA WEO2020 • IEA NZE2050
	Electricity prices	Japan	Yen/kWh	23,780	22,880	25,410	19,360	25,850	• IEA WEO2018
Development of next-generation technologies	Changes in numbers of private automobile users / bus users due to decarbonization	World	%	-	-	-	-	20-50%	• IEA NZE2050 • 4℃ scenario is assumed to be the same as the current level
Increasing severity of extreme weather conditions	Rate of change in instances of rainfall continuing for 12 hours or more	Japan (Hokkaido, Northwest area, Kyushu)	%	-	40%	15%	40%	15%	• "Vision for Flood Control Planning that takes Climate Change into Account" Study Group on Flood Control Planning that takes Climate Change into Account

* IEA (International Energy Agency): The IEA was established in 1974, after the first oil crisis, as an autonomous organization within the framework of the OECD. Its executive office is located in Paris. It has earned a high international reputation for its expertise in all aspects of energy policy.

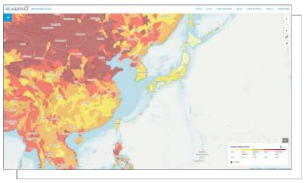
3-58

It is important to obtain objective forecast information on parameters from external sources



Scenario Report
(IEA WEO (World Energy Outlook), IEA ETP (Energy Technology Perspectives) etc.)

External reports
(Industry-specific reports, academic papers, etc.)



Climate Change Impact Assessment Tools
(Physical Risk Map, Hazard Map, etc.)

→See Appendix for examples of parameters.

Source：This Practical Guide (Nishi-Nippon Railroad examples: 3-55, 58)

What kind of parameters should be used? (1) (Transition risks / opportunities)

For transition risks/opportunities, the IEA and others have released parameter data for 1.5°C, 2°C and 4°C scenarios, and parameter data such as the following is available

Parameter (example)	Parameter data
Carbon tax (2030 – 2050)	**Table B.2 ▷ CO_2 prices for electricity, industry and energy production in selected regions by scenario** USD (2020) per tonne of CO_2 — 2030 / 2040 / 2050 Stated Policies (STEPS): Canada 55 / 60 / 75; Chile, Colombia 15 / 20 / 30; China 30 / 45 / 55; European Union 65 / 75 / 90; Korea 40 / 65 / 90 Announced Pledges (APS): Advanced economies with net zero pledges[1] 120 / 170 / 200; China 30 / 95 / 160; Emerging market and developing economies with net zero pledges 40 / 110 / 160 Sustainable Development[2]: Other advanced economies 100 / 140 / 160; Other selected emerging market and developing economies - / 35 / 95 Net Zero Emissions by 2050 (NZE): Advanced economies 130 / 205 / 250; Major emerging economies[3] 90 / 160 / 200; Other emerging market and developing economies[4] 15 / 35 / 55 Note: The values are rounded. ✓ In the **1.5°C scenario (NZE)** for developed countries • 2030: **130** USD/tCO2 • 2050: **250** USD/tCO2 ✓ In the **2°C scenario (APS)** for countries that have pledged net zero emissions by 2050 • 2030: **120** USD/tCO2 • 2050: **200** USD/tCO2 ✓ In the **4°C scenario (STEPS)** for developed countries (EU) • 2030: **65** USD/tCO2 • 2050: **90** USD/tCO2
Grid electricity emission factors (2030 – 2050)	**Table 1.2 ▷ Selected indicators in the Net Zero Emissions by 2050 Scenario** 2010 / 2020 / 2030 / 2040 / 2050 Electricity generation (NZE): CO_2 emissions intensity (g CO_2 per kWh) 575 / 506 / 156 / -1 / -5 Share of unabated coal 40% / 35% / 8% / 0% / 0% Share of renewables 20% / 28% / 61% / 84% / 88% Share of wind and solar PV 2% / 9% / 40% / 63% / 68% ✓ In the **1.5°C scenario (NZE)** worldwide • 2020: **506** g-CO2/kWh • 2030: **156** g-CO2/kWh • 2050: **-5** g-CO2/kWh

→See p2-42 for examples for calculating the impact of carbon tax introduction
→See Appendix for examples of parameters.

Source: IEA "World Energy Outlook 2021"

What kind of parameters should be used? (2) (Transition risks / opportunities)

For transition risks/opportunities, the IEA and others have released parameter data for 1.5°C, 2°C and 4°C scenarios, and parameter data such as the following is available

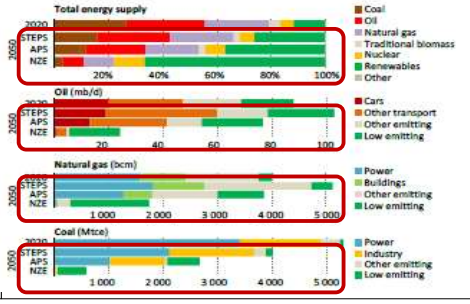
Parameter (example)	Parameter data
Crude oil prices (2030 – 2050)	
Changes in the share of primary energy sources in the energy mix (2020 – 2050)	

Table 2.2 ▷ Fossil fuel prices by scenario

Real terms (USD 2020)	2010	2020	Net Zero Emissions by 2050 2030	Net Zero Emissions by 2050 2050	Sustainable Development 2030	Sustainable Development 2050	Announced Pledges 2030	Announced Pledges 2050	Stated Policies 2030	Stated Policies 2050
IEA crude oil (USD/barrel)	92	42	36	24	56	50	67	64	77	88
Natural gas (USD/MBtu)										
United States	5.2	2.0	1.9	2.0	1.9	2.0	3.1	2.0	3.6	4.3
European Union	8.8	4.2	3.9	3.6	4.2	4.5	6.5	6.5	7.7	8.3
China	7.9	6.3	5.3	4.7	6.3	6.3	8.5	8.1	8.6	8.9
Japan	13.0	7.9	4.4	4.2	5.4	5.3	7.6	6.8	8.5	8.9
Steam coal (USD/tonne)										
United States	60	43	24	22	24	22	25	25	39	38
European Union	109	50	52	44	58	55	66	56	67	63
Japan	127	69	58	50	67	63	73	63	77	70
Coastal China	137	89	61	51	72	66	77	65	83	74
			NZE				APS		STEPS	

- ✓ In the **1.5°C scenario (NZE),** worldwide
  - 2030: **36** USD/barrel
  - 2050: **24** USD/barrel
- ✓ In the **2°C scenario (APS),** worldwide
  - 2030: **67** USD/barrel
  - 2050: **64** USD/barrel
- ✓ In the **4°C scenario (STEPS)**, worldwide
  - 2030: **77** USD/barrel
  - 2050: **88** USD/barrel

Figure 4.15 ▷ Energy supply and demand by fuel and sector, 2020 and 2050



Comparing the 2050 energy mix to 2020 for each scenario shows the following:

- ✓ In the **1.5°C scenario (NZE)**,
  - **The share of renewable energy will increase to approx. 75%, and the share of fossil fuels will decrease to approximately 13%** by 2050
- ✓ In the **2°C scenario (APS)**,
  - **The share of renewable energy will increase to approx. 40%, and the share of fossil fuels** will remain **around 51%** by 2050
- ✓ In the **4°C scenario (STEPS)**,
  - **The share of renewable energy** will be limited to **around 26%** and the **share of fossil fuels** will make up **around 66%** by 2050

→See Appendix for examples of parameter.

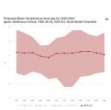
Source: IEA "World Energy Outlook 2021"

What kind of parameters should be used? (3) (Physical risks)

For physical risks, the World Bank and others have released parameter data for 1.5°C, 2°C and 4°C scenarios, and parameter data such as the following is available

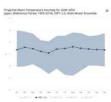
Parameter (example)	Parameter data
Increased average temperature (2040 – 2059)	
Rainfall, flow rate, flood frequency (from 2040)	

- ✓ In the **4°C scenario (SSP5-8.5)**, there is an **average** temperature increase of **2.13°C** for Japan between 2040 – 2059



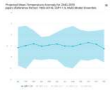
Average temperature increase(°C)	Jan	Feb	Mar	Apr	May	Jun
Average 2.13	2.21	2.15	2.18	1.95	1.84	2.13
	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	2.14	2.14	2.25	2.28	2.17	2.06

- ✓ In the **2°C scenario (SSP1-2.6)**, there is an **average** temperature increase of **1.40°C** for Japan between 2040 – 2059



Average temperature increase (°C)	Jan	Feb	Mar	Apr	May	Jun
Average 1.40	1.36	1.57	1.45	1.22	1.09	1.42
	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	1.47	1.61	1.49	1.42	1.37	1.35

- ✓ In the **1.5°C scenario (SSP1-1.9)**, there is an **average** temperature increase of **1.04°C** for Japan between 2040 – 2059



Average temperature increase (°C)	Jan	Feb	Mar	Apr	May	Jun
Average 1.04	0.84	1.02	1.18	0.97	1.07	1.16
	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	0.98	0.95	1.14	1.29	1.14	0.74

気候変動シナリオ	降雨量	流量	洪水発生頻度
2℃上昇時	約1.1倍	約1.2倍	約2倍
4℃上昇時	約1.3倍	約1.4倍	約4倍

- ✓ In the **4°C scenario**, Japan at the end of the 21st century will have:
  - Rainfall: **approx. 1.3 times**
  - Flow rate: **approx. 1.4 times**
  - Flood frequency: **approx. 4 times**
- ✓ In the **2°C scenario**, Japan at the end of the 21st century (from 2040*) will have:
  - Rainfall: **approx.1.1 times**
  - Flow rate **approx.1.2 times**
  - Flood frequency: **approx.2 times**

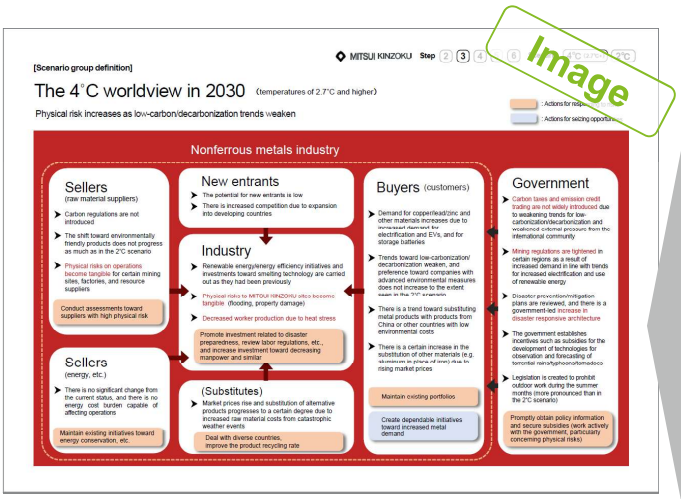
→See p2-43 for examples for calculating the impact of extreme weather
→See Appendix for examples of parameters.

*For 2°C (RCP2.6), the temperature increase is level until around 2040, so it is possible to apply values from after 2040

Sources: The World Bank, "Climate Change Knowledge Portal", Ministry of Land, Infrastructure, Transport and Tourism, Technical Study Group on Flood Control Planning in Consideration of Climate Change, "Proposal for Flood Control Planning in Consideration of Climate Change" (Revised April 2021)

[Stage 3: Shape the worldview in consideration of stakeholders]

Based on forecast information, shape the company's worldview such as future stakeholders' performance and work towards achieving internal and external consensus by incorporating the perspectives from outside of company (if needed)



It would be useful to aim for building internal consensus after incorporating the perspectives from outside of company in order to understand comprehensive worldview.

Components of the worldview surrounding the company (e.g.)

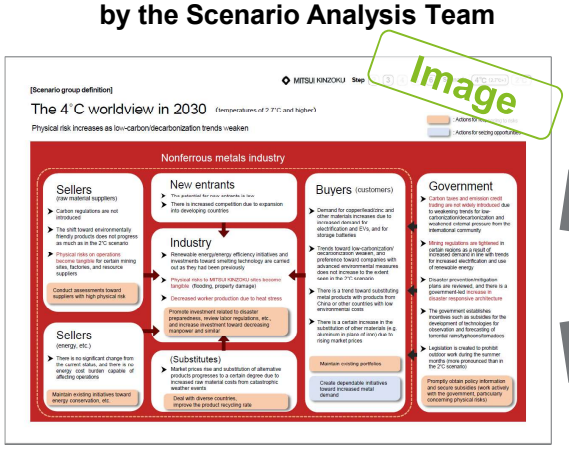
Government	✓ Legal systems and regulations related to risks ✓ Policies to promote opportunities
Industry	✓ Trends, technologies and tendencies related to climate change that are mainstream in the industry
Buyer (Customers)	✓ Customer trends and tendencies affecting products, businesses, and services we provide
Seller (Suppliers)	✓ Trends affecting raw materials and costs required for business
New comer	✓ Businesses themselves and new entrants who can change supply chains
Substitute product	✓ Substitutes, etc., that could affect the market for the products, businesses, and services provided

Source: This Practical Guide (example of Mitsui Mining & Smelting: 3-113)

How to coordinate worldview with each business division?

It is important to create a worldview that can convince relevant departments including business division through dialogue. In order to encourage relevant department members to think of climate change as their own problem, and to share the scenario's meaning and perspective, it is important to have a written narrative or some type of visualization to facilitate discussion.

Worldview (draft) developed by the Scenario Analysis Team



Points in the discussion with each department to coordinate the worldview (Example)

Business Divisions

- ✓ Are there any discrepancies in the worldview, technology, products, etc., related to each business?
- ✓ Is it a worldview that is likely to occur in the future relative to the behavior of the sellers and buyers who interact with us in our day-to-day operations?

Corporate Planning

- ✓ Are there any discrepancies compared with the company's management strategy?
- ✓ Are there any prospects for the future compared to the industry outlook mentioned in our daily operations?

Source: This Practical Guide (example of Mitsui Mining & Smelting: 3-113)

2. Scenario Analysis - Key Points of Practice

Scenario Analysis Guide - Key Points of Practice

2-1. For beginning scenario analysis

2-2. STEP2. Assess materiality of climate-related risks

2-3. STEP3. Identify and define range of scenarios

2-4. STEP4. Evaluate business impacts

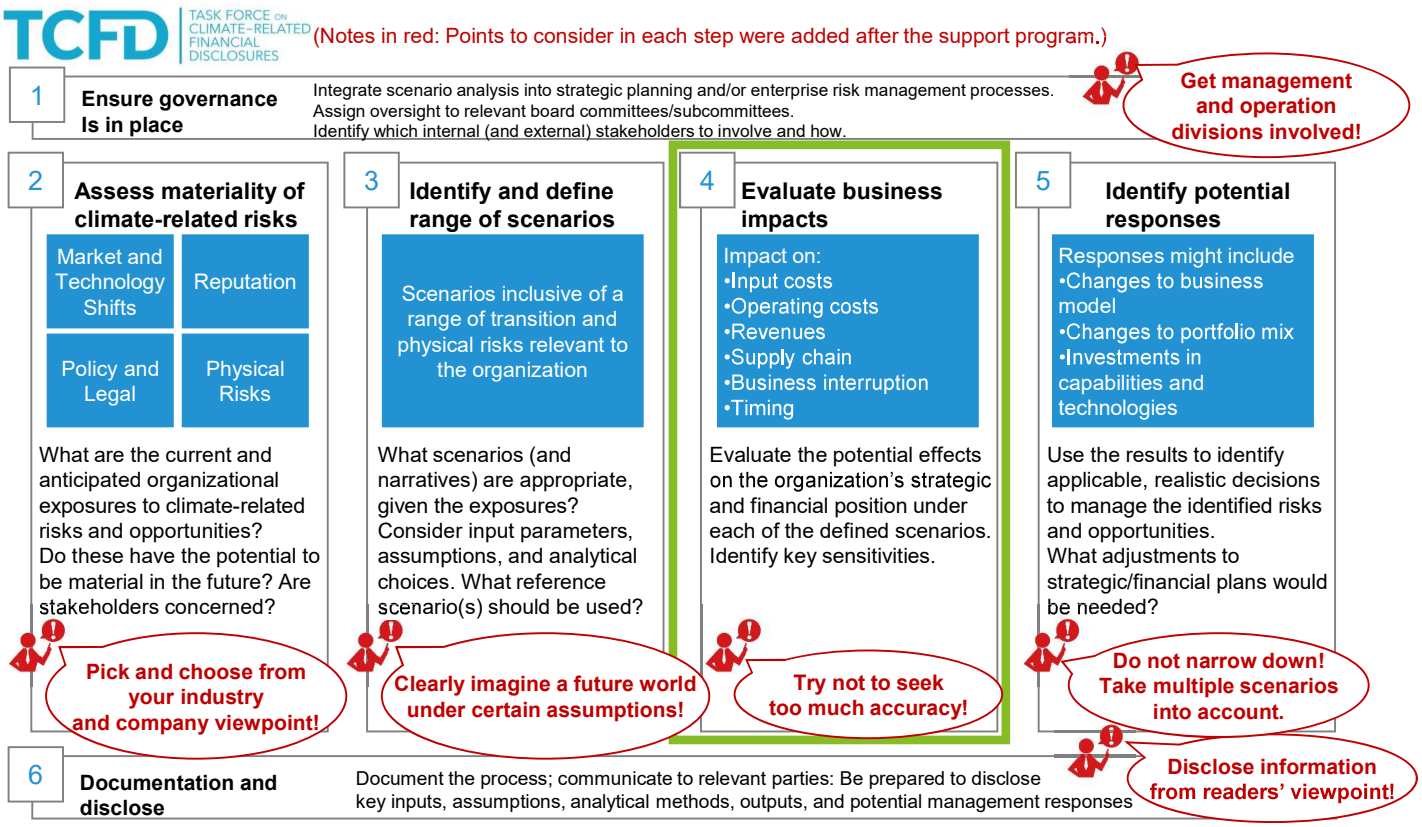
2-5. STEP5. Identify potential responses

2-6. STEP6. Document and disclose information

Chapter 2 Scenario Analysis - Key Points of Practice

This chapter explains how to practically undertake scenario analysis and describes key points of its practice, based on use cases performed by companies under the support program of the Ministry of the Environment.

Evaluate business impacts:
Evaluate the potential effects on the organization's strategic and financial position under each of the defined scenarios.



Sources: The Task Force on Climate related Financial Disclosures, "Technical Supplement The Use of Scenario Analysis in Disclosure of Climate Related Risks and Opportunities", June 2017.

[Overview]

Estimate the financial impact on P/L and B/S, then compare the gap between future perspectives and financial items in the business as usual

Stage 1

Identify potential financial items affected by risks and opportunities

Identify which financial indicators are possibly affected by business impact of climate change

Stage 2

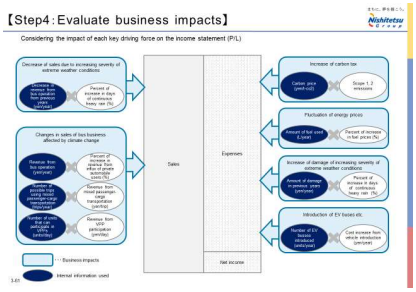
Consider calculation formula and estimate financial impact

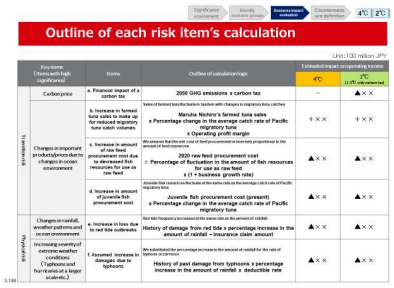
Consider calculation formula for risks that can be estimated, then estimate the financial impact based on internal information

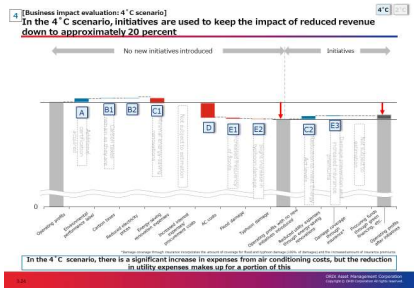
Stage 3

Be aware of the gap between future outlook and financial indicators in the business as usual

Based on the estimated results, be aware of the scale of impact on the future outlook







Note

What kind of internal data can be used for estimation?

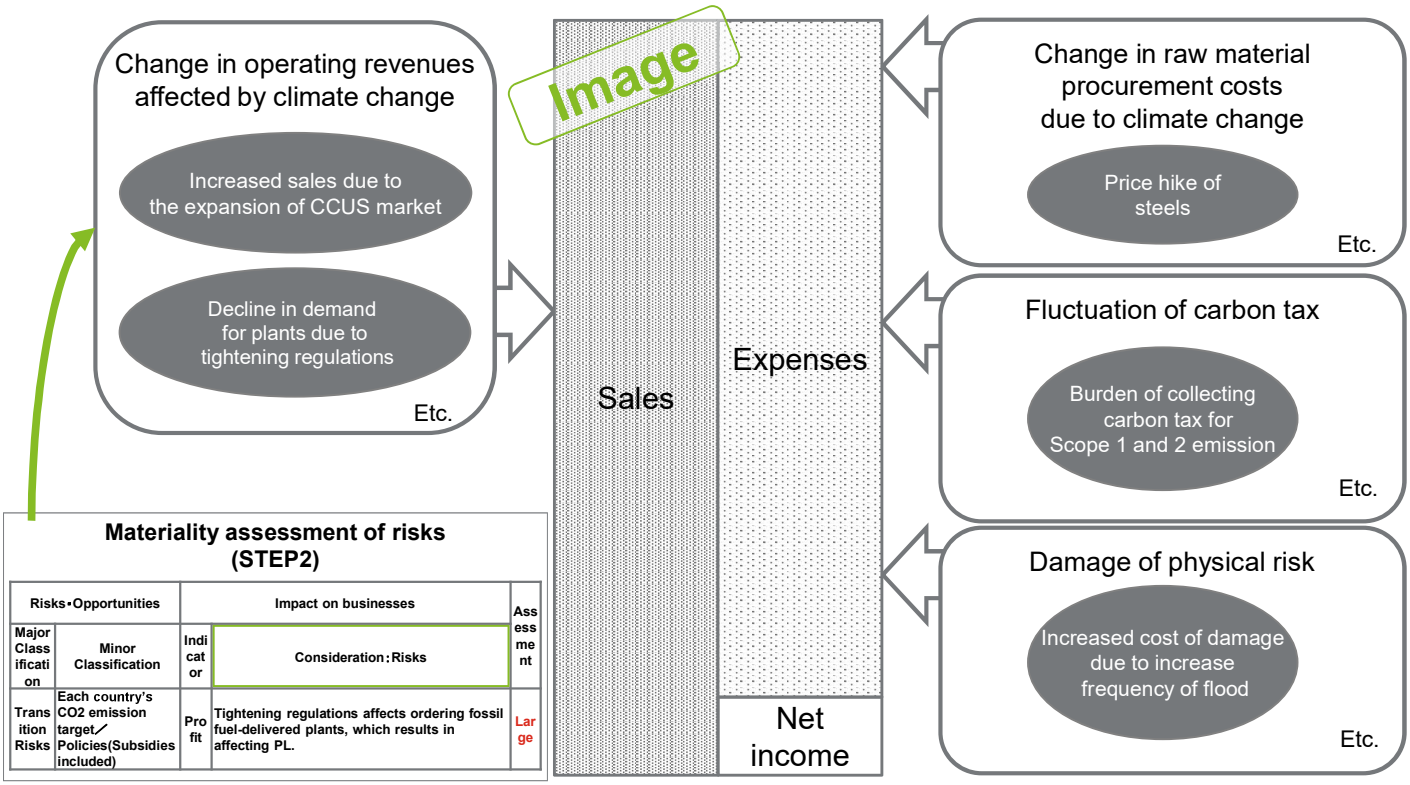
Note

How do we treat data that cannot be quantitatively estimated?

Source: This Practical Guide (Nishi-Nippon Railroad example: 3-61, Maruha Nichiro example: 3-148, ORIX Asset Management example: 3-24)

[Stage1: Identify potential financial items affected by risks and opportunities]

Identify which financial items of P/L and B/S are affected by risks and opportunities



Materiality assessment of risks (STEP2)

Risks・Opportunities		Impact on businesses		Assessment
Major Classification	Minor Classification	Indicator	Consideration：Risks	
Transition Risks	Each country's CO2 emission target／Policies(Subsidies included)	Profit	Tightening regulations affects ordering fossil fuel-delivered plants, which results in affecting PL.	Large

It is crucial to differentiate "Profit" and "Cost" at first (as Fluctuation of profit × Profit ratio = Fluctuation of profit, which also indicates that the impact can be largely different.)

··· Business impact

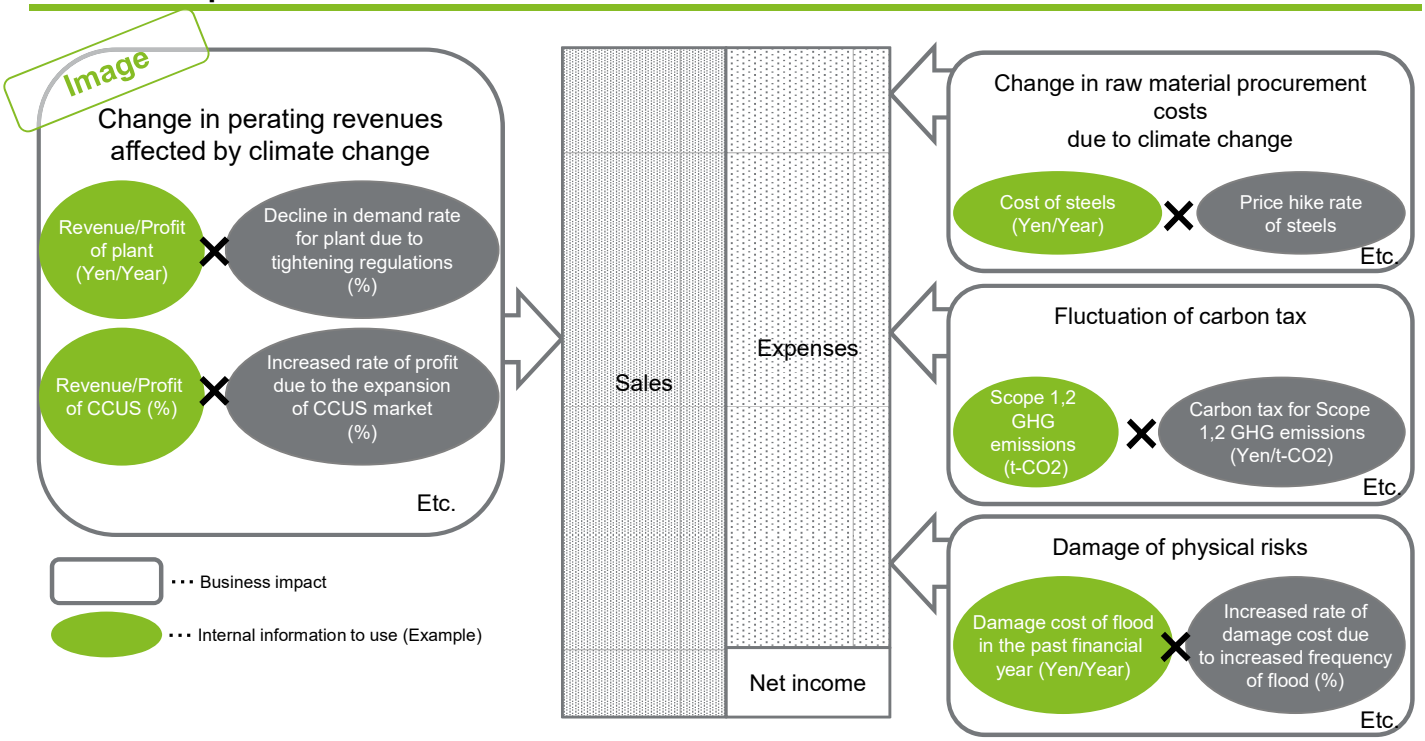
What kind of internal data can be used for estimation?

By using data that is commonly used by business divisions (e.g., sales information by business/products, operational costs, cost structure, greenhouse gas emissions), it is possible to create estimations close to actual company conditions

	Information available for consideration	Methods for collecting information
Sales Structure	**Current and future sales and operating income by business segment** (Targets for net sales and operating income)	✓ Refer to the company's **long-term management targets,** etc. ✓ In the absence of relevant information, it is possible to calculate the current value using CAGR (annual growth rate), etc.
	Sales forecasts and targets for related products in the future (By product)	✓ **Hearings from business divisions, corporate planning, etc.** ✓ If owned, also collect **information on future market conditions normally used by relevant departments**.
Cost Structure	**Current operating costs** (Electricity and fuel prices, electricity and fuel consumption, etc.)	✓ **Hearings from business divisions, corporate planning, etc.**
	Information on the cost structure of raw materials (Amount of raw materials used, procurement cost, etc.)	✓ **Hearings from business divisions, corporate planning, etc.** ✓ If owned, also collect **information on future market conditions normally used by relevant departments**.
	Current and future GHG emissions (Scope 1 and 2, Scope3 if needed)	✓ Refer to the company's **environment-related targets, etc.**

[Stage2: Consider calculation formula and estimate financial impact]

Consider calculation formula for financial indicator that can be estimated, then estimate the financial impact based on internal information



✓**For sectors in which climate change has a significant impact, it will also be effective to conduct analysis as of 2030 in addition to 2050**

✓**It is also important to align operation divisions' awareness of the calculation formula (as well as management, etc., for the second round and after)**

[Formula example for study (1): Introduction of carbon tax]

Calculate the increase in cost from the introduction of a carbon tax by multiplying the CO2 emissions for the scenario analysis target year by the carbon tax; for the assumptions on the emissions volume, changes in emissions factors can also be taken into account

Estimate logic

Increased expenses from introduction of a carbon tax (100 millions JPY) (1.5°C / 4°C) = Scope1 and 2* CO2 emissions (t-CO2) for the target year × Carbon tax on CO2 emissions (JPY/t-CO2)

*Currently Scope1 and 2; it will be effective for sectors significantly impacted by climate change to consider Scope 3, too

Case #1 No change in Scope 2 CO2 emissions factor

(Assumptions)

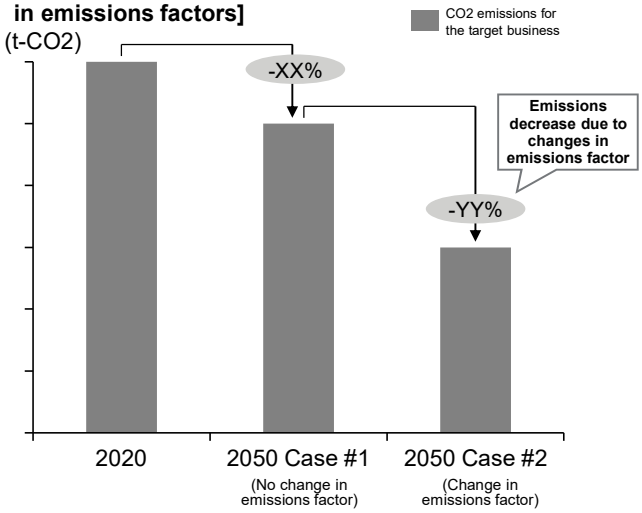
- **Emissions are planned to be reduced by XX% compared to 2020 levels by 2050**
- **As there will be no change in the emissions factor for 2050, the planned reduction in CO2 emissions will remain XX%**

Case #2 Change in Scope 2 CO2 emissions factor

(Assumptions)

- **Emissions are planned to be reduced by XX% compared to 2020 levels by 2050 (same as Case #1)**
- **As the emissions factor for 2050 will be reduced, there will be a greater reduction in CO2 emissions than planned, with an additional reduction of YY% from the reduced emissions factor. Consequently, CO2 emissions will be reduced by (XX% + YY%)**

[Example of changes in emissions factors]



→See p2-31 for examples of parameters for carbon tax, emissions factors, etc.

[Formula example for study (2): Increased incidence of severe weather]

For increased costs due to increased incidence of severe weather, it is possible to calculate the amount of damages using the percentage of increased frequency and the probability of occurrence after calculating the amount of damages per day from operations being suspended

Estimate logic

Amount of damages due to flooding (100 millions JPY) (1.5°C / 4°C) = Increase in frequency (times) × Probability of occurrence (times) × Total amount of damages due to flooding (**YY** millions JPY)

Amount of damages per day (**XX** millions JPY) = Sales (100 millions JPY) × Operating margin (%) ÷ Number of business days (days) ÷ Number of target sites (sites)

Estimated amount of damages due to flooding for each level

[Example for calculating damages]

Flood depth level (Hazard map)	# of company sites	Maximum # of days operations are suspended	Amount of damages at time of occurrence
5m–10m	1 site	45 days	1 site × amount of damages per day (**XX** millions JPY) × 45 days
3m–5m	2 sites	32 days	2 sites × amount of damages per day (**XX** millions JPY) × 32 days
0.5m–3m	0 sites	20 days	0 sites × amount of damages per day (**XX** millions JPY) × 20 days
0.5–1m	2 sites	12 days	2 sites × amount of damages per day (**XX** millions JPY) × 12 days
Under 0.5m	4 sites	6 days	4 sites × amount of damages per day (**XX** millions JPY) × 6 days

Total the amount of damages due to flooding and calculate the total amount of damages, **YY** millions JPY

→See p2-33 for examples of flooding frequency parameters and the Appendix for examples of tools such as hazard maps

How do we treat data that cannot be quantitatively estimated?

Regarding qualitative information or information with little scientific basis, measures such as continuous monitoring and interviews with external experts could be methods for evaluation. It is important to identify evaluated/unevaluated risks and clarify the next action

Image

Risk Item	Validity of quantitative estimation of business impact	Review status
Risk A	**Possible**	**Considered**
Risk B	**Possible**	**Considered**
Risk C	**Not possible** (Qualitative Information Only)	Considered (Qualitative)
Risk D	**Not possible** (no scientific data)	Not considered
Risk E	**Possible**	**Considered**

[Examples of actions for risks that cannot be quantified]

Interviews with outside experts

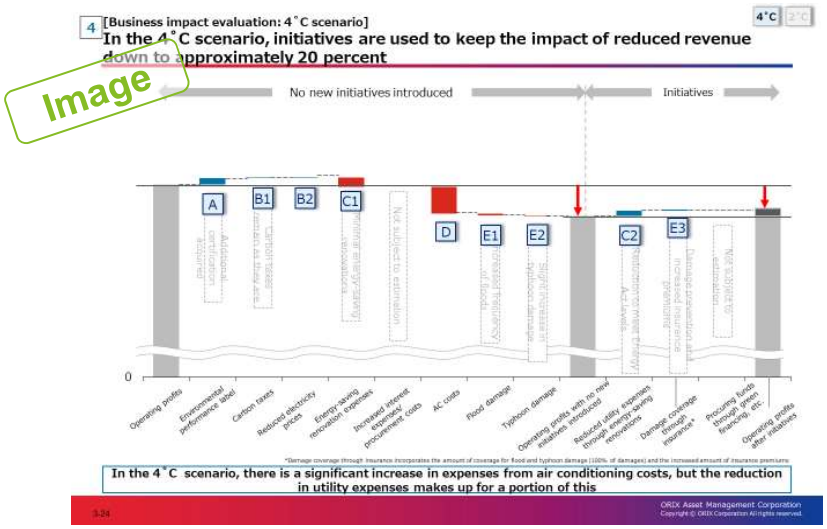
- ✓ Hearings with external experts such as research institutes and experts regarding risks that could not be calculated
- ✓ The results of the hearings are stored as qualitative information.

Continuous internal monitoring

- ✓ Continuously monitor to obtain up-to-date information on risks.

[Stage 3: Be aware of the gap between future outlook and financial indicators in the business as usual]

Based on the estimated results, be aware of the scale of impact on the future outlook



Understand the impact of climate change on business prospects (future management targets and plans)

- ✓ What risks and opportunities have a greater impact?
- ✓ It is possible to understand the extent to which climate change threatens the business prospects for future management and targets. In some sectors and industries, the impact may be smaller than anticipated.

Source: This Practical Guide (example of ORIX Asset Management Corporation: 3-24)

2. Scenario Analysis - Key Points of Practice

Scenario Analysis Guide - Key Points of Practice

2-1. For beginning scenario analysis

2-2. STEP2. Assess materiality of climate-related risks

2-3. STEP3. Identify and define range of scenarios

2-4. STEP4. Evaluate business impacts

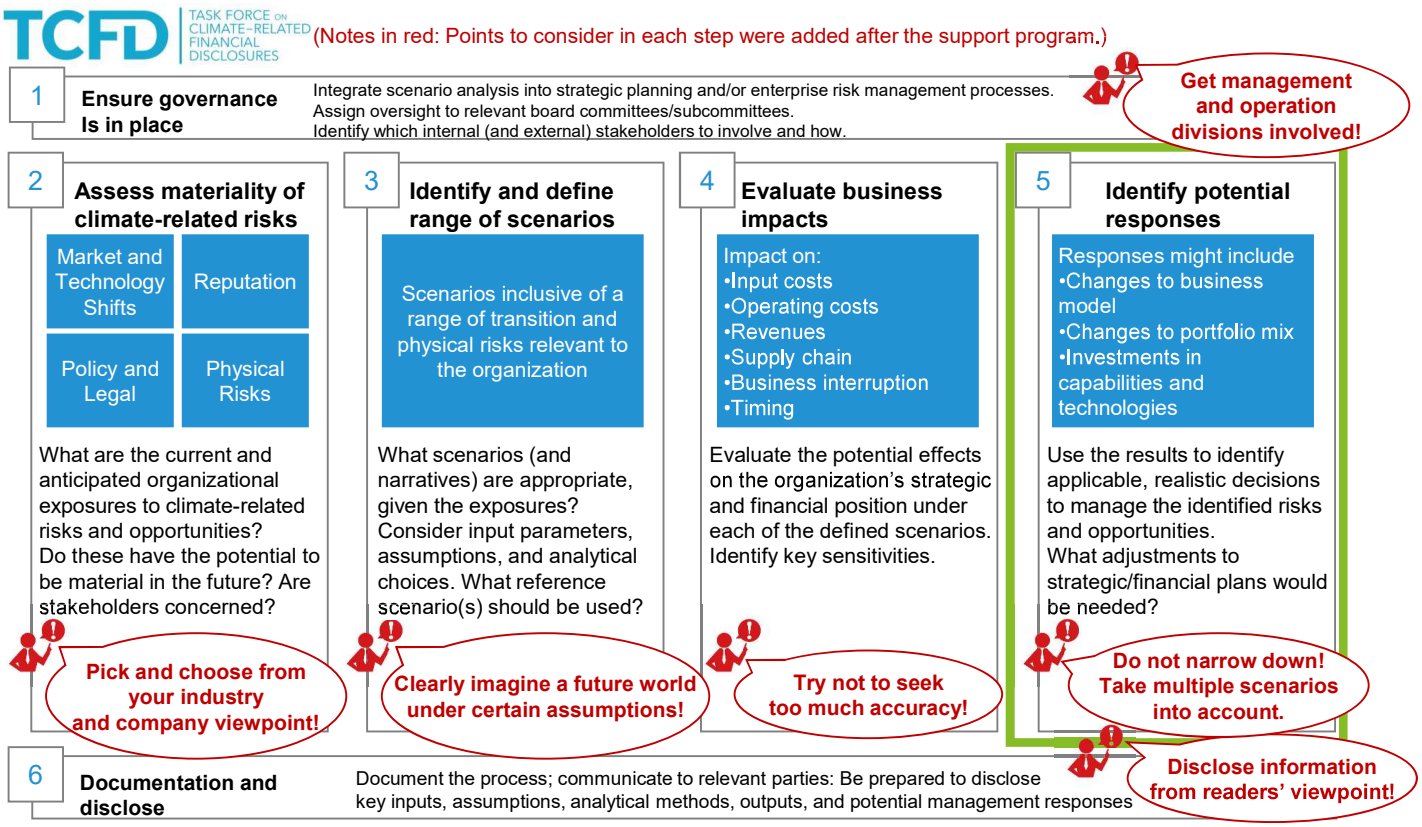
2-5. STEP5. Identify potential responses

2-6. STEP6. Document and disclose information

Chapter 2 Scenario Analysis - Key Points of Practice

This chapter explains how to practically undertake scenario analysis and describes key points of its practice, based on use cases performed by companies under the support program of the Ministry of the Environment.

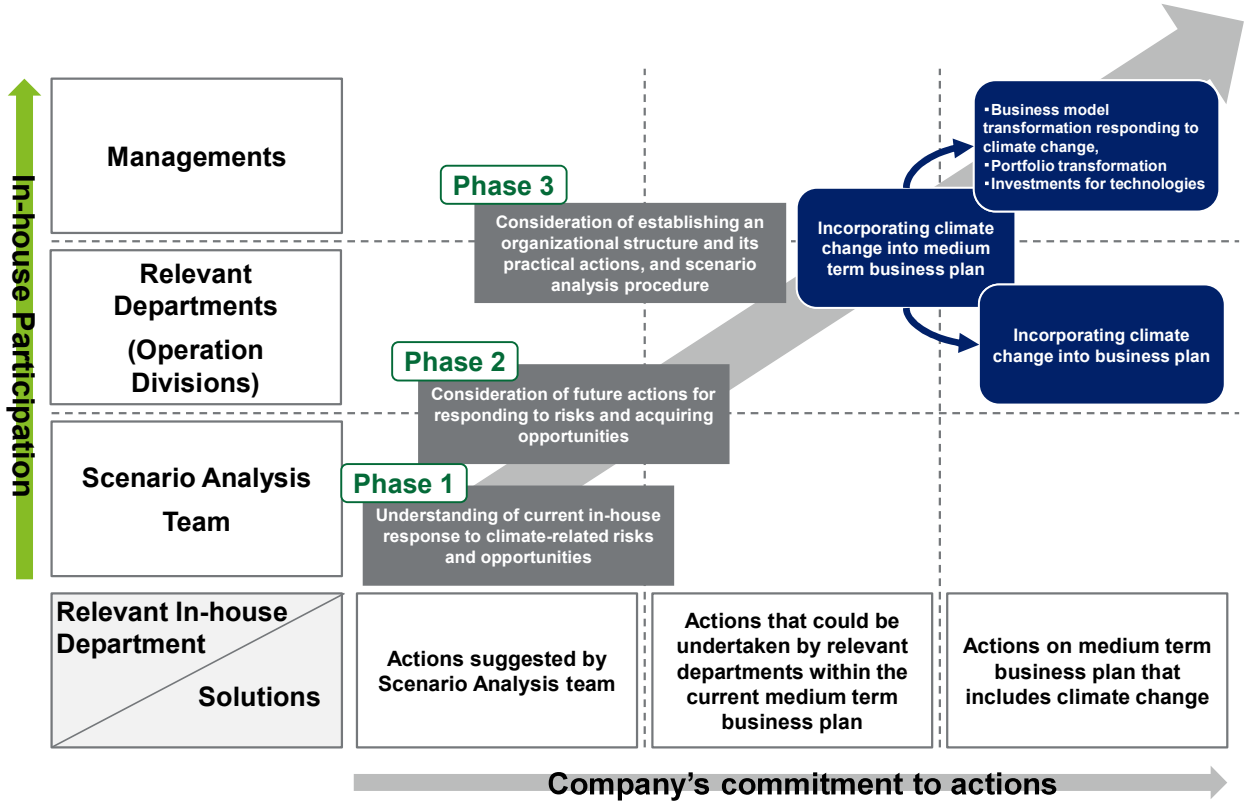
Identify potential responses:
Use the results to identify applicable, realistic decisions to manage the identified risks and opportunities.



Sources: The Task Force on Climate-related Financial Disclosures, "Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate Related Risks and Opportunities", June 2017.

【STEP5. Definitions of Actions / Target of Practical Guide】

Practical Guide demonstrates flows for “integration of climate change into business management (inclusion of climate change into medium term business plan)” as it is crucial for countermeasures involving business model transformation.



[Overview]

Understand company’s current status on risk management, consider countermeasures, and establish practical action plans and an organizational structure

Stage1

Understand company’s current status on risk management

Regarding climate-related risks with great financial impact, it is important to understand the company’s current status for risk management. If necessary, confirm the current status of rival companies

Stage2

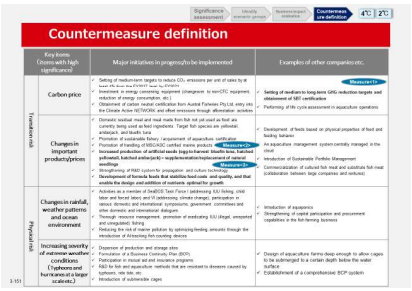
Consider future countermeasures for climate-related risk management and seizing opportunities

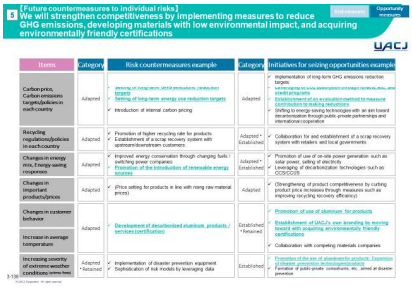
Consider practical countermeasures for risks and opportunities with great financial impact

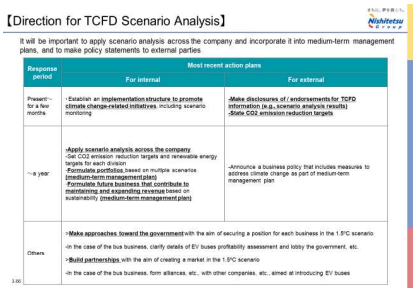
Stage3

Establish an organizational structure and consider practical countermeasures and how to proceed scenario analysis

Establish an organizational structure in order to promote countermeasures and take practical actions cooperating with relevant department. And also consider how to proceed with scenario analysis







Note

How will scenario analysis results be used in management?

Note

What kind of organizational structures are suitable after conducting scenario analysis?

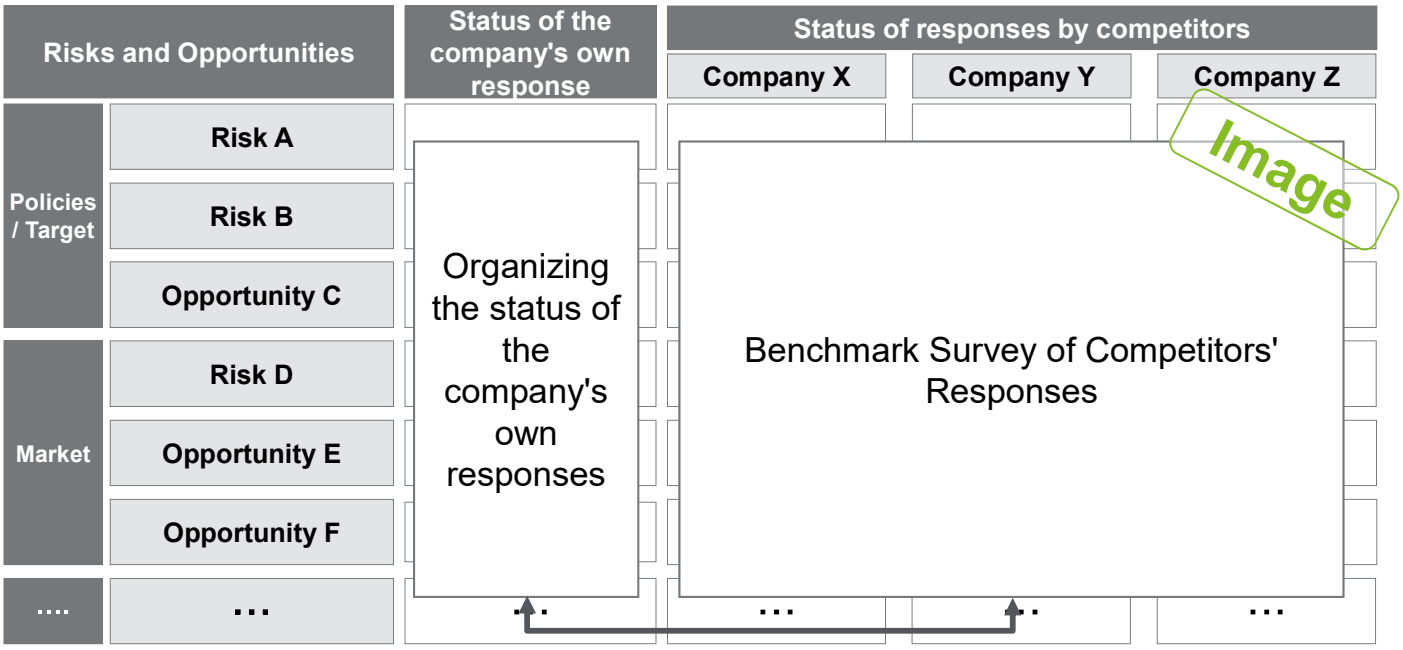
Note

What steps should be taken in the future?

Source: This Practical Guide (Maruha Nichiro example: 3-151, UACJ example: 3-138, Nishi-Nippon Railroad: 3-66)

[Stage1: Understand company's current status on risks management and seizing opportunities]

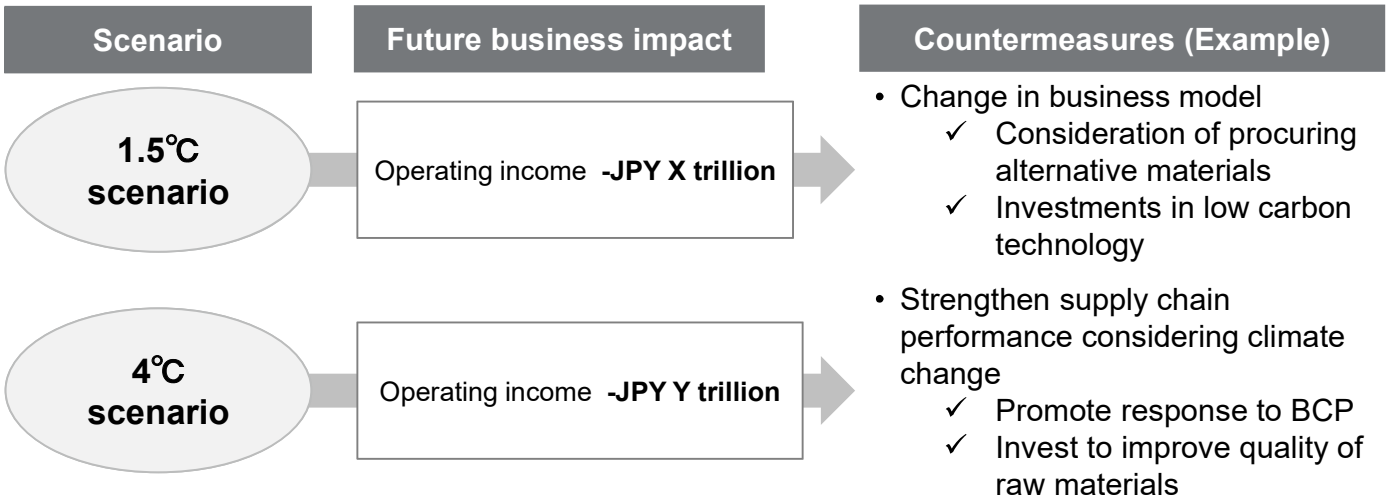
Regarding climate-related risks and opportunities with great financial impact, it is important to understand the company's current status for risk management. If necessary, confirm the current status of rival companies



It is a suggestion to conduct comparative analysis on the company and competitors regarding risk management

[Stage 2: Consider countermeasures for climate-related risk management and seizing opportunities]

Consider practical countermeasures for risks and opportunities with great financial impact



It will become important to plan resilient countermeasures that can be used in any situation. Companies may also try deciding on a rough direction for countermeasures as a bare minimum before going on to consider specific countermeasures in the course of ongoing implementation.

[Stage 3: Establish practical action plans and an organizational structure]

Establish an organizational structure in order to implement countermeasures and take practical actions cooperating with relevant department. And also consider how to proceed with scenario analysis

Image

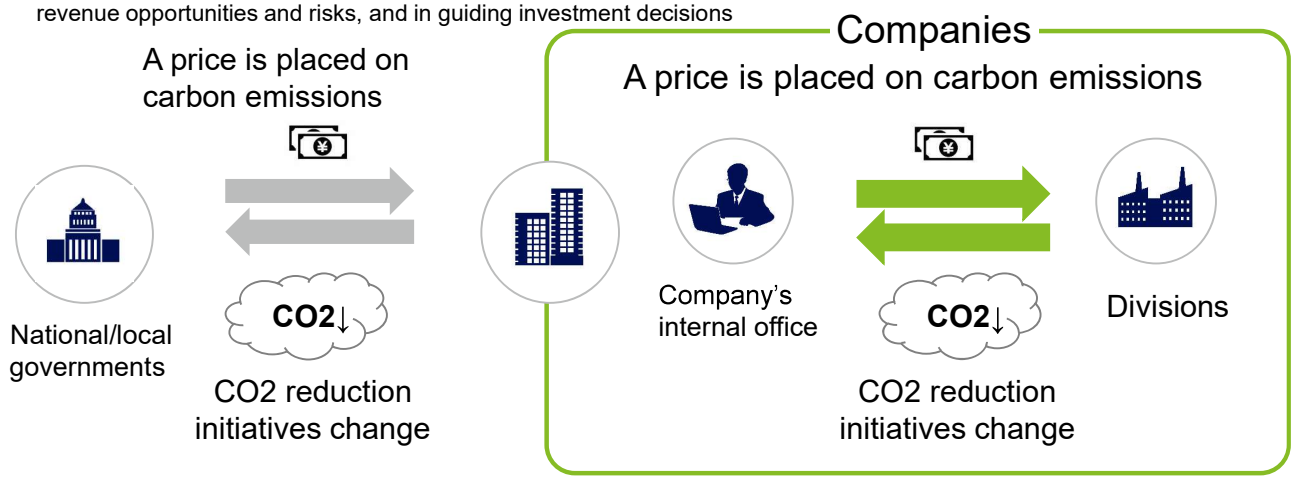
Response implementation period (Example)	Future Actions (Example)		
	Establish an organizational structure	Taking practical actions cooperating with relevant department	How to proceed with scenario analysis
Currently or for a few months	✓ **Dissemination of the results of scenario analysis within the company** (including managements) ✓ **Gaining an agreement from managements on the needs for establishing an organizational structure** in order to promote countermeasures	-	✓ **Interviews with experts on important risks and opportunities** for which there is little information
– 1 year	✓ **Establishing an organizational structure in order to promote countermeasures through explaining to relevant department**	✓ Cooperating with relevant department **and take practical actions aligned with existing business plans that is relatively easy to implement** ✓ Beginning practical consideration with relevant department for new actions	✓ **Establishment of a monitoring system for scenario analysis** ✓ Monitoring
As needed (timings may differ for each company)	✓ **Incorporating climate change into medium term business plan** ✓ Encourage dialogue with stakeholders on climate change to create markets ✓ Introduction of internal carbon pricing as a mechanism to promote low-carbon investment		

Consider scenario analysis procedure, establishing an organizational structure , and getting relevant department involved in the course of scenario analysis, alongside with proceeding the incorporation of climate change into medium term business plan

(Column) What is Internal Carbon Pricing?

Internal Carbon Pricing is carbon prices set by companies and used within them.
It is one potential countermeasure and is a "mechanism" that promotes decarbonization.

- **Internal Carbon Pricing is the price of carbon estimated internally by the company, and is a mechanism for promoting low-carbon investment by companies**
- It is a method used in corporate planning, and is leveraged in incentives for promoting energy efficiency, the identification of revenue opportunities and risks, and in guiding investment decisions



Systems related to carbon pricing

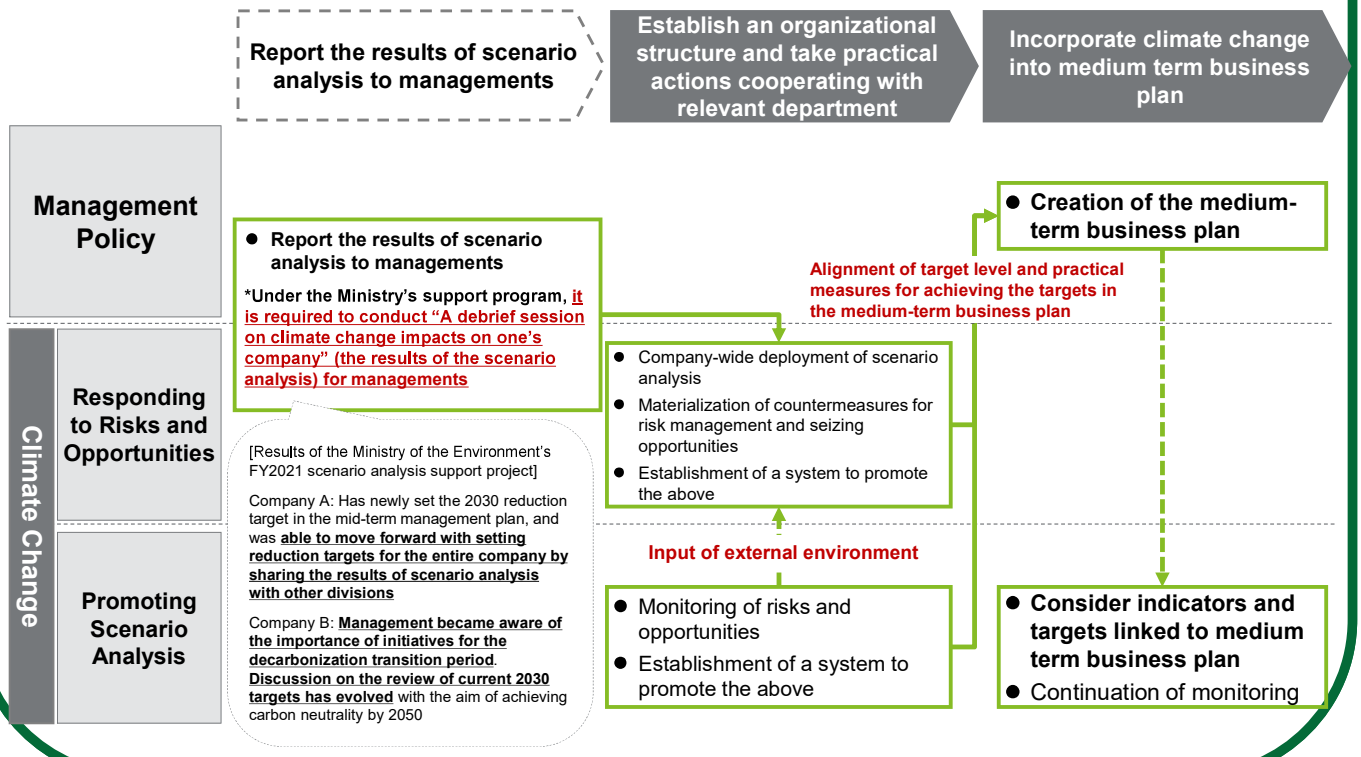
Internal Carbon Pricing

→See "Utilization Guidelines for Internal Carbon Pricing (Updated March 2022)" published by the Ministry of the Environment for information on ICP

Source: TCFD, "Recommendations of the Task Force on Climate-related Financial Disclosures" (2017.6)

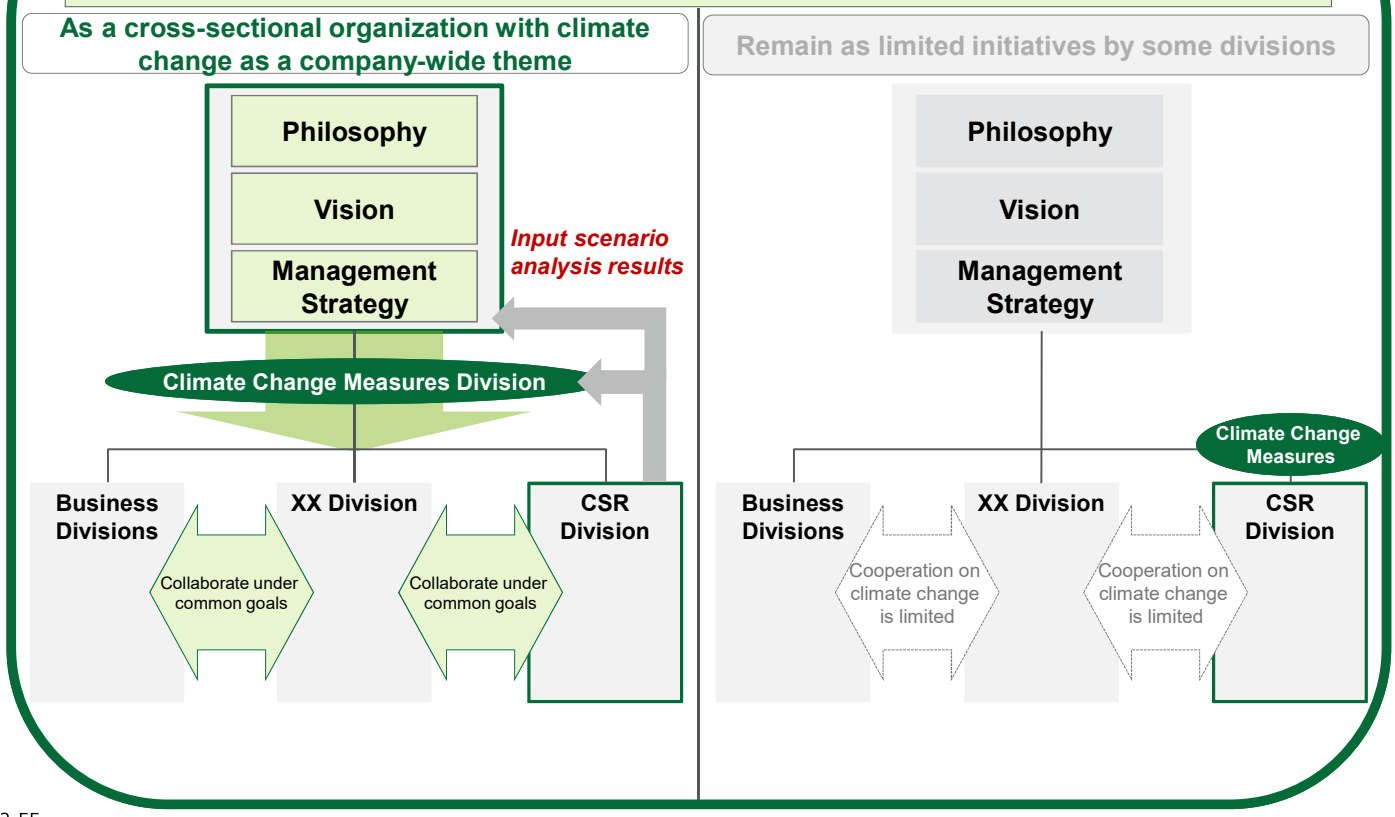
How will scenario analysis results be used in management?

It is important that climate change be included in the process of business strategy planning. One tip is to include climate change into the nearest midterm management plan



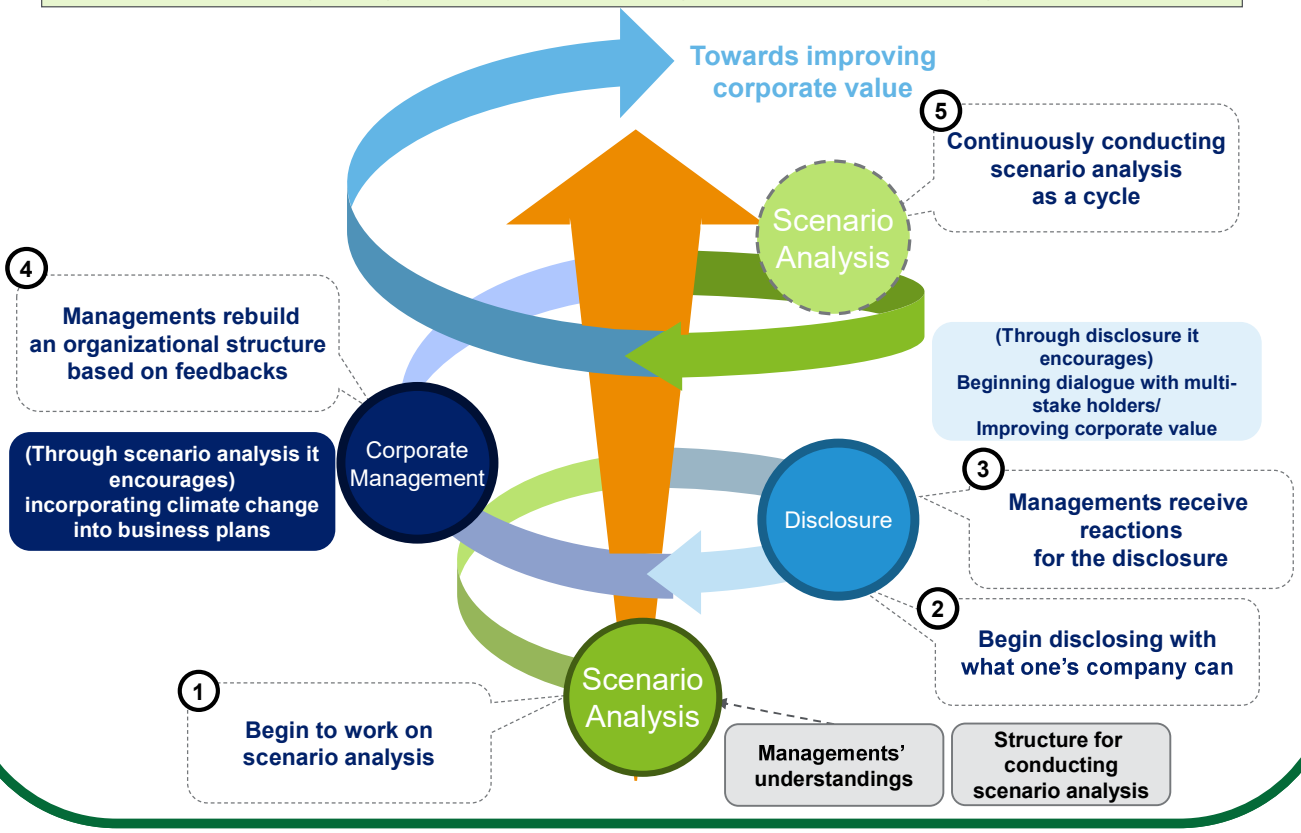
What kind of organizational structures are suitable after conducting scenario analysis?

It may be suggested to create a cross-sectional organization directly under the corporate planning department that deals with climate change to give effectiveness to the result of scenario analysis



Actions to be taken for the next step?

The goal of scenario analysis is to integrate climate change with business management, and to enhance corporate value. With scenario analysis, it aims to continue the cycle of disclosing information and rebuilding an organizational structure (integration with business management).



2. Scenario Analysis - Key Points of Practice

Scenario Analysis Guide - Key Points of Practice

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Chapter 2 Scenario Analysis - Key Points of Practice

This chapter explains how to practically undertake scenario analysis and describes key points of its practice, based on use cases performed by companies under the support program of the Ministry of the Environment.

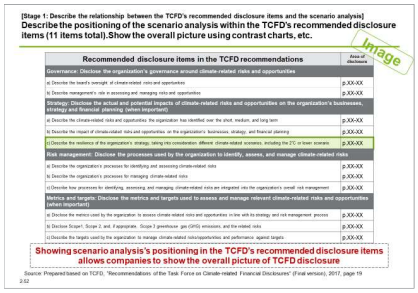
[Overview]

Describe the positioning of scenario analysis in the TCFD's recommended disclosure items and the results obtained from each step; use appropriate disclosure to achieve increased corporate value

Stage 1

Describe the relationship between the TCFD's recommended disclosure items and the scenario analysis

Describe the positioning of the scenario analysis within the TCFD's recommended disclosure items (11 items total). Show the overall picture using contrast charts, etc.


[Stage 1: Describe the relationship between the TCFD's recommended disclosure items and the scenario analysis]
Describe the positioning of the scenario analysis within the TCFD's recommended disclosure items (11 items total).Show the overall picture using contrast charts, etc.

Image

Recommended disclosure items in the TCFD recommendations	Area of disclosure
Governance: Disclose the organization's governance around climate-related risks and opportunities	
a) Describe the board's oversight of climate-related risks and opportunities	p.XX-XX
b) Describe management's role in assessing and managing risks and opportunities	p.XX-XX
Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning (when important)	
a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	p.XX-XX
b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	p.XX-XX
c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including the 2°C or lower scenario	p.XX-XX
Risk management: Disclose the processes used by the organization to identify, assess, and manage climate-related risks	
a) Describe the organization's processes for identifying and assessing climate-related risks	p.XX-XX
b) Describe the organization's processes for managing climate-related risks	p.XX-XX
c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management	p.XX-XX
Metrics and targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities (when important)	
a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	p.XX-XX
b) Disclose Scope1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	p.XX-XX
c) Describe the targets used by the organization to manage climate-related risks/opportunities and performance against targets	p.XX-XX

Showing scenario analysis's positioning in the TCFD's recommended disclosure items allows companies to show the overall picture of TCFD disclosure

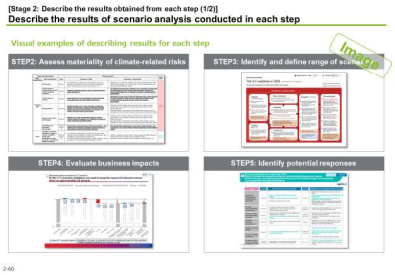
Source: Prepared based on TCFD, "Recommendations of the Task Force on Climate-related Financial Disclosures" (Final version), 2017, page 19

2-62

Stage 2

Describe the results obtained from each step

Described the results obtained from scenario analysis for each step


[Stage 2: Describe the results obtained from each step (1/2)]
Describe the results of scenario analysis conducted in each step

Visual examples of describing results for each step

STEP2: Assess materiality of climate-related risks

STEP3: Identify and define range of scenarios

STEP4: Evaluate business impacts

STEP5: Identify potential responses

Image

2-60

***It may also be helpful to reference TCFD Guidance 2.0**

Point

"What" and "how much" should be disclosed?

2-58

[Stage 1: Describe the relationship between the TCFD's recommended disclosure items and the scenario analysis]

Describe the positioning of the scenario analysis within the TCFD's recommended disclosure items (11 items total). Show the overall picture using contrast charts, etc.

Image

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Showing scenario analysis's positioning in the TCFD's recommended disclosure items allows companies to show the overall picture of TCFD disclosure

Source: Prepared based on TCFD, "Recommendations of the Task Force on Climate-related Financial Disclosures" (Final version), 2017, page 19

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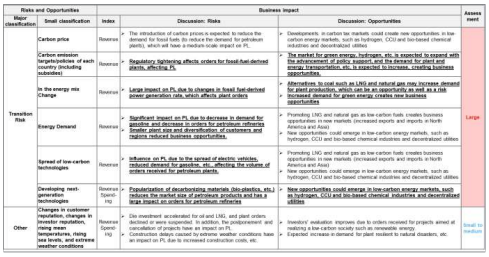
[Stage 2: Describe the results obtained from each step (1/2)]

Describe the results of scenario analysis conducted in each step

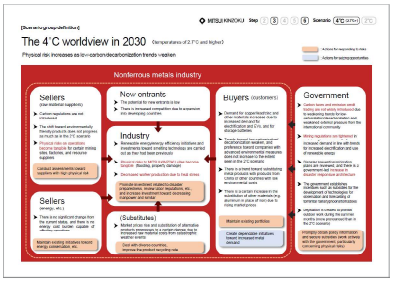
Visual examples of describing results for each step

Image

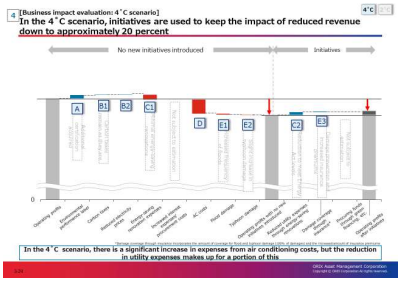
STEP2: Assess materiality of climate-related risks



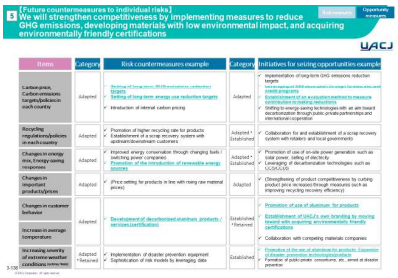
STEP3: Identify and define range of scenarios



STEP4: Evaluate business impacts



STEP5: Identify potential responses



[Stage 2: Describe the results obtained from each step (2/2)]

It is important to describe climate change-related governance, as well as what was understood from the scenario analysis results and how the company plans to respond

Results of interviews with investors/experts

It is not the disclosure itself that will be evaluated; showing the results of risk/opportunity identification and the effect scenario analysis results have on management strategy is the important thing

- ✓ It is not the disclosure itself that will be evaluated; **what is important is using qualitative terms to communicate the company's current initiatives/future initiatives.** Disclosures should be made on the assumption that dialogue will take place and **describe the scenario analysis in an easy-to-understand manner as a starting point for discussion.**
- ✓ For scenario analysis disclosures, **investors want to know how the results of the scenario analysis will affect management strategy**. They are concerned that there will be companies that make scenario analysis an end in itself.
- ✓ The results of scenario analysis show that **aiming for carbon neutrality by 2050 is not enough; what is important is that this is reflected in the transition. It is meaningful to present interim targets for 2030, etc., and if they are not along the carbon neutrality by 2050 path,** it is **important to show in an easy-to-understand manner how transitions will be made**

Disclosing the following will make it easier to describe the resilience of the organization's climate change-related strategies

- ✓ **Status of climate change-related governance structure** — STEP1 (p2-10 – 12)
- ✓ **Information of data used as the basis for each scenario analysis** — STEP3 (p2-26 – 32)
- ✓ **Explanation of the company's appropriate transition toward decarbonization by 2050** — STEP5 (p2-50 – 51) STEP6 Disclosure case studies(2)(3)(2-64,65)
  - ✓ **Current/future initiatives toward risks/opportunities identified from the scenario analysis** — STEP5 (p2-49) STEP6 Disclosure case studies (1)(2-63)
  - ✓ **Narrative for climate change-related value creation based on scenario analysis results** — →See the Appendix for transition case studies
  - ✓ **(If necessary) 2030 interim targets and transition plans**
- ✓ **How the company will proceed with scenario analysis and achieve the goals** — STEP5 (p2-52)

Page number

Source: Prepared based on interviews conducted by the Ministry of the Environment in FY2020-2021 toward investors and experts

“What” and “how much” should be disclosed?

Investors are focused on the impact on operations, such as management‘s involvement and how scenario analysis results are leveraged in the company’s business and management. Additionally, it is recommended to implement a scenario based on recent decarbonization trends (currently the 1.5°C scenario), and focus is also being put on disclosures made through a wide variety of media

Results of interviews with investors/experts

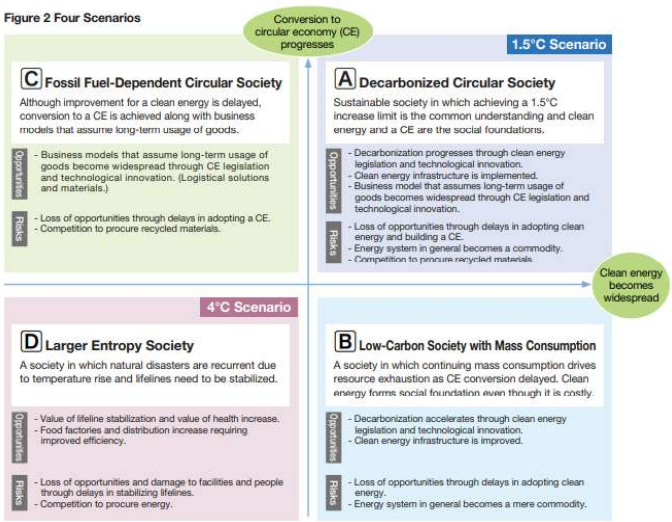
For beginning scenario analysis	**What is important is whether the company has a structure that allows it to proceed with scenario analysis, as well as management's understanding** ✓ Scenario analysis is an area which is not yet covered by mainstream discussions in company management. Because of this, many companies have outsourced the first round of scenario analysis to external consultants in their corporate planning and so on, and it is questionable whether the company has established a structure that enables it to tackle scenario analysis on its own ✓ While involving external experts is a good tactic, investors are more concerned about how the company's senior management understands sustainability risks and discusses them at board meetings
Assess materiality of climate-related risks	**This area is the core of scenario analysis, and risks/opportunities affecting businesses should be explained in detail** ✓ This area is the core of scenario analysis, and should be explained in detail
Identify and define range of scenarios	**Along with the reasons for selecting a wide variety of scenarios, it is also recommended to implement scenarios in line with current trends (currently the 1.5°C scenario)** ✓ The reasons for scenarios being selected are important, as opinions on scenarios may vary according to the industry ✓ If the company has added its own variables to the parameters, specific explanation is needed, as side-by-side comparisons with other companies cannot be made in such cases ✓ A 1.5°C scenario aimed at 2050 may be necessary for companies with a goal of carbon neutrality by 2050, or for sectors with high emissions
Evaluate business impacts	**Disclosure of quantitative information is also being considered in light of increased implementation of systems and recent trends toward strengthening disclosure of climate-related information** ✓ There is no international consensus on the methodology for impact evaluation, and at present, investors may be satisfied with qualitative information. It is expected that demand for quantitative information will be determined by the future actions of financial supervisory authorities and the influence those actions have on financial institutions and general business companies afterward ✓ Rather than providing figures, it may be better to disclose the process for internal discussions and have direct dialogue concerning impacts that cannot be publicly disclosed ✓ Investors want to know how climate change will affect business, so the company should put a theoretical image of this into figures, even if it is only a rough one ✓ As exemplified by disclosures in securities reports, deepening of the relationship between climate-related information and financial information is being called for ✓ ESG investors are also paying attention to financial impact disclosure, and the TCFD’s metrics and targets guidance also includes the importance of disclosing financial impact
Identify potential responses	**Investors are focused on how the results of scenario analysis will be leveraged in the company's business and management** ✓ Investors are focused on how the results of scenario analysis will be leveraged in the company's business and management ✓ It is also important to express how climate change risks / sustainability issues will be addressed in strategies and which kinds of actions are insufficient
Document and disclose information	**With the revision of the Corporate Governance Code, companies should focus on disclosure through various media such as reports and websites** ✓ With the revision of the Corporate Governance Code, investors will start to look at a wide range of disclosure media. In most cases, they will look at integrated reports and sustainability reports, but it is considered ideal if information related to the TCFD recommendations is summarized on the company’s website so that investors can check the latest versions for later review ✓ The basic premise is governance disclosure, and whether management has declared its commitment ✓ The basic understanding is that TCFD disclosures listed in integrated reports, etc., will also be included in the Corporate Governance Code

Source: Prepared based on interviews conducted by the Ministry of the Environment in FY2020-2021 toward investors and experts

[Examples of how to show the organization‘s strategic resilience (1): Panasonic (electrical appliances/machinery/communications)]

Panasonic set a wide variety of scenarios including the 1.5°C scenario and made a clear statement of its business’ ability to respond to the risks/opportunities for each scenario; it also stated its intention to aim for the worldview in the 1.5°C scenario

Panasonic describes the fact that the company is able to respond no matter which worldview of the four scenarios is realized to express the organizational strategy’s resilience



1. Home appliance business
- ① Attain energy conservation performance in our products that surpass those of competitors, and offer energy saving value in customers' daily lives by utilizing IoT/AI. A B
- ② Increase usage of recycled materials and employ recycling-oriented manufacturing. A C

2. Air quality and air conditioning business
- ① Create safe and secure, clean and comfortable spaces with our exclusive clean technologies in homes, shops, workplaces, transportation, public areas, and many other locations. A B C D

3. Food distribution business
- ① Promote energy conservation offering comprehensive support for our energy monitoring system, which covers system installation to operations and maintenance. The equipment refurbishing service prolongs the system's usage, while contributing to material recycling. A B C

4. Smart Energy System business
- ① Demonstrate energy management through practical and full usage of hydrogen energy and roll out the RE100 solution business. A B D

5. Electrical facility materials business
- ① Reduce energy consumption by producing more energy-efficient equipment and installing energy management systems in houses and buildings. A B C D

6. Frontline process innovation business
- ① Reduce waste energy and waste goods by supply chain orchestration, such as streamlining corporate customers' logistics and responsive tuning of demand and supply. A B
- ② Offer solutions to improve energy efficiency and automation at corporate customers. A B

7. Automotive device business
- ① Expand assortment of products that contribute to electrification and weight reduction of vehicles. A B C D
- ② Expand the number of products made from recycled resin materials. A C

8. Automotive battery business
- ① Encourage shift to electric vehicles through further performance enhancement, cost reduction, and production expansion. A B C
- ② Reduce energy usage in material procurement, by reducing or making usage of rare metals zero (e.g. cobalt) and promoting recycling of battery materials. A B C

9. System device business
- ① Provide devices and modules that contribute to electrification and enhanced power usage efficiency of vehicles. A B
- ② Contribute to peak shaving of data centers etc. by strengthening our skills to offer the optimum power storage systems. A B

The scenario analysis found that we could always focus on one or more of our businesses in each of the four scenarios. In other words, the analysis successfully verified the resilience of our business strategies. The analysis also helped us understand that we can contribute to building a sustainable society through our businesses. We continue our efforts to build the 1.5°C world, represented by our society A.

For the four scenario worldviews, Panasonic lists the company’s businesses that are able to respond to those worldviews to present its strategies as being resilient no matter which worldview is realized

Source: Panasonic Corporation, "Sustainability Data Book 2021"
https://www.panasonic.com/jp/corporate/sustainability/pdf/sdb2021j.pdf