

Guidance on Climate-related Financial Disclosures 2.0

(TCFD Guidance 2.0)

TCFD

July 2020 (revised March 2022)



TCFD
Consortium

< Revision history >

- March 2022: Newly added a section on international shipping in section 10 of Chapter 3: Sector-Specific Recommended Disclosures.

<References to the TCFD recommendations cited in this document>

Final report: Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017)

<https://www.fsb-tcf.org/wp-content/uploads/2017/06/FINAL-2017-TCFD-Report-11052018.pdf>

Annex: Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017)

Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities (June 2017)

Foreword



Kunio Ito

Chair of the TCFD Consortium, Director of Hitotsubashi CFO Education and Research Center

In Japan, there has been an increase in the momentum to respond to the TCFD recommendations following the formulation of the TCFD Guidance by the Ministry of Economy, Trade and Industry (METI) in 2018. The TCFD Consortium was established under the initiative of the private sector in May 2019 with the cooperation of the government. Currently, Japan has the largest number of TCFD supporters with 290 institutions, about 20% of the world's

total.

In the TCFD Consortium, companies and investors engaged in information disclosure and its utilization activities based on the TCFD recommendations have been undergoing discussions. To date, the TCFD Consortium has promoted various initiatives such as the formulation of the "Green Investment Guidance" and co-hosting the TCFD Summit hosted by METI.

As a result, the awareness of TCFD in Japan has increased, and this has led to a surge in corporate disclosure and constructive engagement based on the information disclosed. To further enhance this momentum, the Consortium has revised the TCFD Guidance, and announced it as "TCFD Guidance 2.0" with the aim of enhancing corporate value and revitalizing financial and capital markets through the further utilization of the TCFD recommendations.

In the TCFD Guidance 2.0, we have expanded our sector-specific guidance in the financial sectors and food industry. We have also expanded our commentary on TCFD disclosure and included a wide range of examples of disclosure in our case studies. As more attention is drawn to TCFD due to recent extreme weather and other consequences of climate change, the Consortium as the world's largest TCFD supporter organization hopes to cooperate with the world and provide strong support on the practical aspects of implementation of the TCFD recommendations.



Mary L. Schapiro

Vice Chair for Public Policy, Special Advisor to the Founder and Chairman, Bloomberg LP, and Secretariat of TCFD

The TCFD recommendations continue to receive worldwide support from companies, investors, stock exchanges, governments, and regulators alike. Japan has been at the forefront of recognizing the importance of the TCFD recommendations, and the large number of Japanese supporters - nearly 300 to date - is evidence of its leadership in both the public and private sectors.

Now, TCFD champions in Japan are demonstrating the next steps required to transition from support to implementation. Formed last year with the support of METI, JFSA and MOE, the TCFD Consortium provides a valuable platform for companies and investors to facilitate a constructive dialogue on TCFD implementation.

I would like to congratulate the TCFD Consortium for their efforts and commitment to promoting greater transparency on climate and informed decision-making to build a more resilient global economy. The publication of the TCFD Guidance 2.0 in Japan embodies Prime Minister Abe's vision to promote information disclosure in line with the TCFD recommendations for accelerating a virtuous cycle of environment and growth.

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Chapter 1 Introduction

A. Background

In response to the Paris Agreement adopted in December 2015, there has been an increase in climate change mitigation and adaptation activities worldwide. The financial industry has also been stepping up efforts to assess the potential impacts of climate change on its assets, given the substantial impacts climate change may have on the activities of the companies to which they provide financial solutions. Institutional investors that make long-term investments, such as pension funds and insurance companies, have become more conscious of environment, social and governance (ESG) elements, including climate change, as factors affecting the corporate risks and opportunities to be considered in their financial decisions. The world's ESG investments increased 1.7 times in the four years between 2014 and 2018¹. The impact of COVID-19 in 2020 has shed light on social issues affecting employees, other stakeholders, etc., and thus has revealed the growing importance of ESG as a factor in investment decisions. The focus on an environment-friendly recovery has increased considerably and addressing climate change is regarded as a central issue.

The degree of corporate disclosure related to the potential impacts of climate change, on the other hand, has been inadequate. Financial institutions were unable to understand climate-related risks and opportunities (hereinafter referred to as “climate-related issues”) in relation to the strategies and financial planning of companies. As a result, financial institutions were unable to make adequate decisions on investment, lending, and insurance underwriting, and thus were concerned about the risk of financial instability caused by significant volatility of asset values in the future. In response to this, the G20 Finance Ministers and Central Bank Governors asked the Financial Stability Board (FSB) to review how the financial sector could take account of climate-related issues. At the review meeting held in September 2015, the FSB identified a clear need for better information on climate-related risks from companies to enable financial institutions to properly assess the financial impacts of climate-related issues on companies.

Following this, the FSB established the private sector-led Task Force on Climate-related Financial Disclosures (TCFD) in December 2015. The TCFD is composed of 32 members from financial services companies and organizations such as banks, insurance companies, and pension funds, as well as non-financial companies working in areas such as energy, transportation, and materials. In June 2017, following a consultation period of about eighteen months, TCFD published its Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures (hereinafter referred to as the “TCFD recommendations”). The

¹ Global Sustainable Investment Alliance (GSIA) "Global Sustainable Investment Review 2016" (<http://www.gsi-alliance.org/members-resources/trends-report-2016/>) and "Global Sustainable Investment Review 2018" (<http://www.gsi-alliance.org/trends-report-2018/>)

TCFD recommendations provide a framework for the voluntary disclosure of climate-related risks.

The situation surrounding the disclosure and use of climate-related information has evolved significantly since the publication of the TCFD recommendations. As of July 2020, more than 1,350 organizations have expressed their support for the TCFD recommendations, up from 102 organizations at the time of the publication of the TCFD recommendations. According to the TCFD Status Report released by TCFD in June 2019, 91% of the companies surveyed intended to implement the TCFD recommendations in full or in part. A TCFD survey of corporate annual reports, on the other hand, indicated that the average number recommended disclosures published in public corporate reports, out of the 11 disclosures recommended, increased from 2.8 in 2016 to 3.6 in 2018, with further disclosure remaining as an issue to be tackled in the future (Figure 1)².

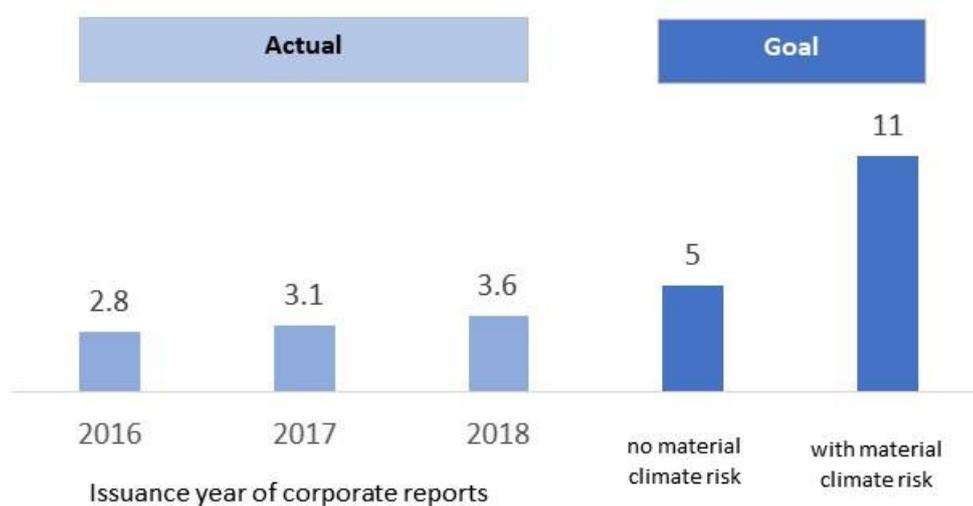


Figure 1 Progress in the number of items disclosed by companies

Source: Task Force on Climate-related Financial Disclosures: 2019 Status Report (actual figures denote average number of recommended disclosures included in various corporate reports)

Under these circumstances, the response to TCFD is rapidly progressing in Japan. When the TCFD recommendations were first published, the United States and United Kingdom were ahead in the number of organizations supporting TCFD. Since then, however, momentum in the number of company responses to the TCFD recommendations has gradually increased in Japan, leading to the establishment of the TCFD Consortium in May 2019. The number of organizations in Japan supporting the TCFD recommendations reached 164 when the consortium was established, putting Japan at the forefront in TCFD support. The number of

² Based on a survey conducted by TCFD on 3,000 companies which signed up for updates on the TCFD website (of the 485 respondents, 198 were preparer companies, 180 of which responded intentions to implement TCFD recommendations). regarding their intention to respond to recommendations from TCFD. The current status of corporate information disclosure is based on an analysis of 1,126 major companies whose annual reports were published in English between 2016 and 2018.

Japanese supporters has steadily increased since. As of July 27, there are 290 Japanese supporters of TCFD recommendations, making up more than 20% of the total number of supporting organizations worldwide. In October 2019, the world's first "TCFD Summit" (See Column 1) was held in Tokyo, which was organized by the Ministry of Economy, Trade and Industry of Japan (METI) and co-hosted with World Business Council for Sustainable Development (WBCSD) and the TCFD Consortium, and discussed the future direction of TCFD. The TCFD Consortium publicly introduced its "Guidance for Utilizing Climate-related Information to Promote Green Investment (Green Investment Guidance)" (hereinafter referred to as the "Green Investment Guidance": See Column 2) at the TCFD Summit, and subsequently garnered substantial support for the same. Key takeaways from the TCFD Summit included the need to transition "from divestment to engagement" and "the importance of assessing not only of risks associated with climate change, but also opportunities."

Japan has also seen significant progress in information disclosure through TCFD-related efforts. The number of Japanese companies responding to the CDP (See Column 5) has continued to increase, reaching a record high of 316 in 2019. The number of Japanese companies listed on the CDP A list, an index of the most advanced companies in environmental information disclosure and performance, reached 38, the highest in the world. The trend confirms that information disclosure has improved in terms of substance (Figure 2).

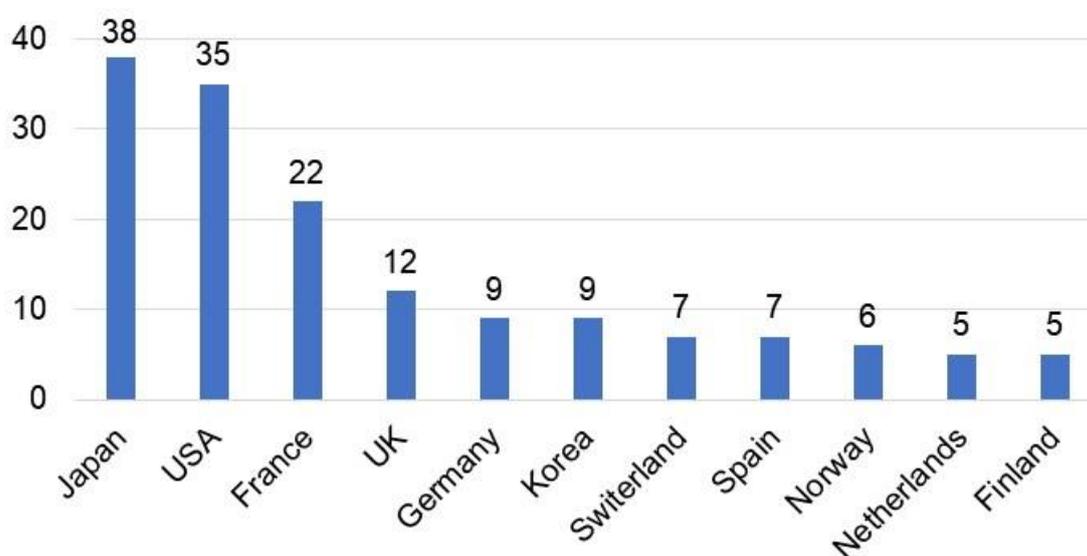


Figure 2 CDP 2019 A List of Companies by Country (Top 10 Countries)

Source: TCFD Consortium, based on data by CDP³

The organizations that have become TCFD supporters are also playing a major role in reducing national greenhouse gas (GHG) emissions. Under Japan's Act on Promotion of Global

³ <https://www.cdp.net/en/companies/companies-scores>

Warming Countermeasures, companies whose GHG emissions are above a certain level are required to report the emissions through a Mandatory Greenhouse Gas Accounting and Reporting System (hereinafter referred to as the “SHK system” which is an acronym of its Japanese name: See Column 3). While only 3% of the approximately 12,000 companies reporting to the SHK system have become TCFD supporters, their emissions account for more than 40% of the emissions by all of the reporting companies. The trend of GHG emission reductions by TCFD-supporting companies in Japan are more pronounced compared to those in other companies, demonstrating that TCFD-supporting companies are clearly contributing to the reduction of GHG emissions for the whole country (See Figure 3).

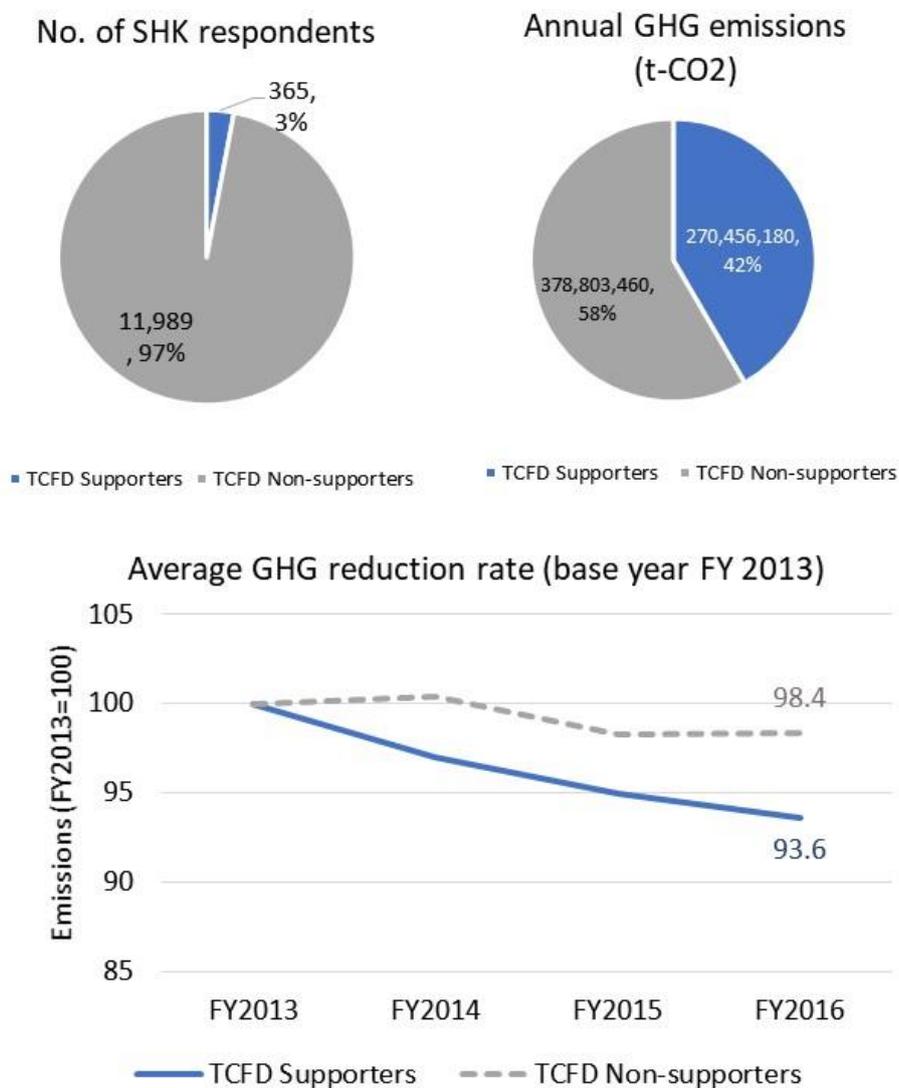


Figure 3 Relationship between SHK respondents and TCFD supporters

(Upper left: by no. of institutions, upper right: by annual GHG emissions, bottom: average GHG reduction rate)
 Source: From METI, based on SHK data and TCFD supporters.

Note: No. of SHK respondents and annual GHG emissions are data from FY 2016, and TCFD supporters as of April 2020. Companies whose parent company supports TCFD are included as TCFD supporters.

Column 1 The Inaugural TCFD Summit⁴.....

The inaugural TCFD Summit held on October 8, 2019 was organized by METI and co-hosted by WBCSD and the TCFD Consortium. The purpose of the Summit was to bring together leaders from the business and financial sectors who are making advanced efforts in the world in pursuit of a “virtuous cycle of environment and growth”. Summit participants discussed TCFD issues and TCFD’s future direction with a view to putting the TCFD recommendations into practice.



Scene at the TCFD Summit (left) and Professor Ito, Chair of the TCFD Consortium (right)

Approximately 350 participants from around the world attended the inaugural TCFD Summit. Notable participants related to TCFD, such as Mr. Mark Carney, then Governor of the Bank of England, Mr. Peter Bakker, President and CEO of WBCSD, Ms. Mary L. Schapiro, Vice Chair for Public Policy, Special Advisor to the Founder and Chairman, Bloomberg LP, and Secretariat of TCFD, and Mr. Charles O. Holliday, Chairman of Royal Dutch Shell, took part in discussions on the future directions of TCFD. Professor Ito, Chair of the TCFD Consortium announced the “Guidance for Utilizing Climate-related Information to Promote Green Investment (Green Investment Guidance)”, a document published by the TCFD Consortium as a guidance for investors to evaluate the disclosure information of companies.

In closing remarks, Mr. Peter Bakker, President and CEO of WBCSD, delivered a message that divestment has its limitations, rather constructive engagement is a more powerful tool to generate a positive flow of finance for energy transition, and that it is important to adopt a pragmatic approach in Asia to promote sustainable economic development and support a smooth transition towards a low-carbon society. Summit participants learned of the important role TCFD is playing in promoting private sector investment toward a low-carbon economy. They agreed that a continued efforts to bring together a wide range of stakeholders from industry, the financial community, governments, regulators, and international organizations would need to focus on efforts to implement the TCFD recommendations.

⁴ <https://tcf-summit.org/indexEn.html>

Column 2 Guidance for Utilizing Climate-related Information to Promote Green Investment (Green Investment Guidance)⁵.....

The “Guidance for Utilizing Climate-related Information to Promote Green Investment (Green Investment Guidance)”, released by the TCFD Consortium in October 2019 provides a set of guidance to investors and other users of information. Practically speaking, it can be regarded as a counterpart to this guidance. The Green Investment Guidance lists three elements necessary to realize a “virtuous cycle of environment and growth”: promote constructive dialogue (engagement) to enhance corporate value; identify and assess the risks and opportunities posed by climate change; promote innovation for decarbonization and create mechanisms for the appropriate flow of funds. In line with the TCFD recommendations, investors and other stakeholders should understand the following perspectives.

Governance	<ul style="list-style-type: none"> It is important for investors and other stakeholders to consider a company’s organizational structure in terms of governance to address climate change, and also whether it is actually functional and effective to that end.
Strategy and Business Model	<ul style="list-style-type: none"> It is more important for investors and other stakeholders to check and assess the alignment between the decision-making processes that led to a company’s strategies and the scenarios used as well as their appropriateness within the industry and the company’s responses to the strategies it has developed, than the accuracy of scenario data and analytical results provided by the company.
Risks and opportunities	<ul style="list-style-type: none"> It is important for investors and other stakeholders to have a balanced evaluation of a company’s risks and opportunities, by understanding a company’s efforts to address risks, while also actively evaluating the potential opportunities of climate actions. It is important for investors and other stakeholders to recognize the importance of a company’s efforts toward innovation as a climate action, and to positively evaluate the relationship between innovation and the company’s long-term strategies, as well as organizational structure to promote innovation.
Performance and Key Performance Indicators (KPI)	<ul style="list-style-type: none"> It is important for investors and other stakeholders to understand a company’s rationale for establishing the specific KPIs that it manages and discloses, and confirm their alignment with the company’s strategies. In comparative evaluation of KPIs, it is important for investors and other stakeholders to consider the relevant industry characteristics. Investors and other stakeholders are encouraged to evaluate companies by considering not only their GHG emissions through the entire value chain but also their contributions to emission reduction at the usage of their products and service.

⁵ https://tcf-consortium.jp/en/news_detail/19100802

B. Purpose of Developing this Guidance

In order to achieve the goals under the Paris Agreement⁶, drastic changes in society through major innovation will be essential. To that end, it will be necessary to establish a “virtuous cycle of environment and growth” through the processes shown below.

Companies appropriately visualize their efforts to create innovation, in order to make them clear to their investors and other stakeholders (“investors and other stakeholders” refer to investors, lenders, insurance companies, and other users of climate-related financial disclosures, here and hereinafter in this Guidance), while investors and other stakeholders appropriately provide finances to such companies. This mutual exchange of support allows companies to realize innovation and growth; the profits generated are distributed to investors and other stakeholders; the investment returns are re-invested in further innovation.

In the meantime, discussions related to climate-related financial disclosure have been conducted mainly by the financial authorities and entities within the financial industry against the backdrop of changes in the financial market, such as those mentioned in section A, and efforts for financial disclosure by non-financial companies have not made adequate progress. Considering that many non-financial companies are currently affected by climate change, companies must recognize how climate change affects their business activities and will potentially impact them financially, and communicate the relevant information to investors and other stakeholders to get them to understand the impacts, if climate change is deemed to have material impacts on their business models. At the same time, by explaining how their production activities, products and services contribute to the resolution of climate change issues, and how that contribution drives their growth, companies can show investors that they can expand sustainably even while incurring climate change impacts.

In order to realize the “virtuous cycle of environment and growth,” companies must interact with their investors and other stakeholders not just by responding to their requests, but by actively communicating their strengths to them and repeatedly holding constructive dialogues with them to deepen their mutual understanding.

The TCFD recommendations are deemed to be a useful set of tools for dialogue between companies and investors and other stakeholders. The utility of the recommendations lies in their scope as an international framework commissioned by the G20, and there is a current movement to integrate them into global frameworks for corporate evaluation and national and regional systems. From the viewpoint of non-financial companies, meanwhile, some of the TCFD recommendations require further examination on many points, such as the principles for deciding the medium of disclosure, the scenario analysis, and the methods for incorporating the characteristics of each business. Hence, some non-financial companies have

⁶ In December 2015, nearly 200 governments agreed under the Paris Agreement to step up the global response to the threat of climate change by “Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels.”

found it difficult to promote disclosures in accordance with the TCFD recommendations.

For this reason, METI decided to develop a guidance designed to provide commentaries and introduce reference case examples for implementing the TCFD recommendations, and to provide “sector-specific perspectives” to be disclosed by non-financial companies and considered by investors and other stakeholders. Toward this end, METI established the “Study Group on Implementing the TCFD Recommendations for Mobilizing Green Finance through Proactive Corporate Disclosures” (hereinafter referred to as the “TCFD Study Group”) in August 2018. Considering that the content of the disclosures required by investors and other stakeholders concerns the management decisions of companies, the TCFD Study Group invited board members in charge of the finance and corporate planning of companies to discuss methods of disclosure in accordance with the TCFD recommendations. This “dialogue” between the managers of companies, domestic and foreign investors, and other stakeholders led to the development of this Guidance.

The global implementation of the TCFD recommendations has only recently begun. The TCFD recommendations mention that “the Task Force expects that reporting of climate-related risks and opportunities will evolve over time as organizations, investors, and others contribute to the quality and consistency of the information disclosed.” From this perspective, the accrual of company disclosures and investor feedback in response is expected to shed light on the ways forward to better disclosure.

This Guidance was developed to present the first steps for the promotion of the implementation of the TCFD recommendations and to provide commentaries on the TCFD recommendations based on issues identified through discussions in the TCFD Study Group and the Working Group established under the Study Group. Further reviews of this Guidance and enhancements in commentaries are expected, where appropriate, in accordance with the progress of disclosure practices.

C. Purpose of the Revision to this Guidance

As mentioned in section B, the TCFD Guidance was developed through discussions within the TCFD Study Group established by METI, under the assumption that it will be reviewed and expanded as the disclosure of climate-related information progresses.

More than a year has passed since the publication of the TCFD Guidance. Over this time, there has been a significant increase in the number TCFD supporters and a significant improvement in the substance of the information disclosed. Under these circumstances, it is anticipated that by incorporating the latest knowledge on TCFD and promoting TCFD disclosure in a broader range of industries, companies will be able to internationally disseminate information on their efforts, which in turn will enhance appropriate evaluations and dialogues by and with investors both in Japan and abroad. The TCFD Consortium, an entity established in May 2019 which builds upon the activities of the TCFD Study Group, has become a hub for accumulating knowledge through discussions between companies and investors and other stakeholders. It was therefore decided to revise the TCFD Guidance under the initiative of the TCFD Consortium. The main points of the revision are as follows.

First, the latest findings have been reflected in the revised Guidance. As described in section A, public and private organizations in many countries are releasing guidance documents on TCFD as the disclosure and use of climate-related information gathers pace around the world (See Appendix 2). One example is the Green Investment Guidance announced by the TCFD Consortium in October 2019. In Chapter 2 "Commentaries on Disclosures in Accordance with the TCFD Recommendations," the commentaries are expanded based on the knowledge and data gained from these guidance documents.

Second, recommended disclosures for the food, banking, life insurance, non-life insurance and international shipping sectors are newly included in Chapter 3 "Sector-Specific Recommended Disclosures". Behind this is the growing momentum in the food industry to enhance information disclosure both in Japan and abroad, as evidenced by the publication of a guidance document by the WBCSD in April 2020. Financial sectors such as banking, life insurance, and non-life insurance have also seen progress in disclosure practices, in light of the accumulation of disclosure cases by financial institutions in recent years and the publication of guidance documents, as well as the need for further disclosure in the future. Given that these industries have different value chain structures and different expected risks and opportunities, and the recommended disclosure items vary between sectors, disclosure recommendations based on the characteristics of each industry are described.

Third, collected case examples of disclosure have been expanded, in view of the recent quantitative and qualitative improvements in the disclosure of climate-related information both in Japan and abroad. In particular, there has recently been an increase in disclosure cases that show better alignment with the TCFD recommendations, and recent updates and case examples will serve as useful references for companies that are starting information disclosure.

In addition, the scope was expanded to include industries newly added to the sector-specific recommended disclosure, in Chapter 3.

On the basis of the three points mentioned above, this Guidance was revised by incorporating the opinions of the Steering Committee members (see Appendix 1) as well as other members of the Consortium.

D. Where this Guidance Stands

(1) Overall Picture of the TCFD Recommendations and Supplemental Documents

In addition to the “TCFD Recommendations,” TCFD prepared “Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures”, a supplemental document for implementing the TCFD recommendations, and “The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities”, a set of commentaries designed to support scenario analysis.

The TCFD recommendations, as described in Figure 4 present general recommendations, as well as recommended disclosures and commentaries structured around the four thematic areas of Governance, Strategy, Risk Management, and Metrics and Targets.

The supplemental documents contain commentaries for implementing the TCFD recommendations, and sector-specific commentaries have been developed for the aforementioned four thematic areas, as shown in Figure 5.



Figure 4 Core Elements of Recommended Climate-related Financial Disclosures

Source: “Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), P. v.

Supplemental Guidance for Financial Sector and Non-Financial Groups											
Industries and Groups	Governance		Strategy			Risk Management			Metrics and Targets		
	a)	b)	a)	b)	c)	a)	b)	c)	a)	b)	c)
Financial	Banks		■			■			■		
	Insurance Companies			■	■	■	■		■		
	Asset Owners			■	■	■	■		■	■	
	Asset Managers			■		■	■		■	■	
Non-Financial	Energy			■	■				■		
	Transportation			■	■				■		
	Materials and Buildings			■	■				■		
	Agriculture, Food, and Forest Products			■	■				■		

Figure 5 Supplemental Guidance for Financial Sector and Non-Financial Groups

Source: “Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), P.15.

(2) Relationship between this Guidance and the TCFD Recommendations and Supplemental Documents

This Guidance consists of three chapters. Chapter 1 describes the background leading up to the launch of TCFD’s activities, the purpose of developing this Guidance, and the relationships between this Guidance and the TCFD recommendations and supplemental documents.

Chapter 2 sorts out questions on the TCFD recommendations and supplemental documents, and provides explanations on questions raised. When developing this Guidance, a questionnaire survey was sent out to all members to extract questions. Explanations were prepared by referring to comments from assorted members working in financial institutions and a member involved in the development of the TCFD recommendations, along with case examples from domestic and overseas entities. The explanations were drafted in the expectation that they would be revised in the future as best practices are accumulated through the ongoing promotion of disclosure by many companies. With this revision, the latest findings and further case examples were collected to enhance the content of the Guidance.

In Chapter 3, sector-specific recommended disclosures are demonstrated for nine sectors (seven from the non-financial groups and three from the financial group). Recommended disclosures were presented for the non-financial groups in the thematic areas of Strategy and Metrics and Targets. This was done because different industries face different climate-related risks and opportunities, and the method for presenting a desirable strategy for companies to implement disclosure and metrics and targets based on such strategy differ from industry to

industry. Descriptions of disclosures on governance and risk management are included for the financial group, as the methods for disclosing their investment and lending activities differ among sectors.

Facilitated dialogue between companies and investors and other stakeholders based on such sector-specific disclosure is expected to lead to a more effective “virtuous cycle of environment and growth.”

The TCFD recommendations provide that “the Task Force encourages further research and analysis by sector and industry experts to increase organizations’ understanding of climate-related risks and opportunities”⁷. The importance of such sector-specific analysis is therefore thought to be recognized.

Similar efforts on sector-specific analysis are underway in the private sector. SASB⁸ has presented sustainability metrics for each of 77 industries, while WBCSD⁹ has developed a series of guidance documents to respond to the TCFD recommendations for sectors such as oil and gas and chemicals. These movements to promote financial disclosure consistent with the TCFD recommendations based on the characteristics of each industry are spreading on a global level (See Column 5).

In the meantime, the various efforts underway should evolve into a comprehensive activity through the sharing of accumulated expertise and best practices. This Guidance has been developed to contribute to this discussion. Five industrial sectors with significant GHG emission in the use phase or manufacturing phase have been selected for this Guidance: automobiles, iron and steel, chemicals, electrical and electronics, and energy. The Guidance also covers the food sector, with its significant physical risk, and financial institutions (banking, life insurance, non-life insurance sectors) as well as international shipping, and presents key points for disclosure according to the specific characteristics of each industry. The content of Chapter 3, like that of Chapter 2, is therefore expected to be revised and enhanced as more companies work on disclosure and the scope of industries covered by Guidance expands.

⁷ “Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), P.36.

⁸ Sustainability Accounting Standards Board

⁹ World Business Council for Sustainable Development

Column 3 Japan's Corporate Governance Code¹⁰.....

The Corporate Governance Code promulgated by the Tokyo Stock Exchange in 2015 establishes fundamental principles for effective corporate governance.

One of the general principles is “Ensuring appropriate information disclosure and transparency.” The Corporate Governance Code was revised in 2018 to include the disclosure of corporate ESG elements.

General Principle 3 (basic policy) of Japan's Corporate Governance Code provides that the board should be actively involved in the disclosure and provision of non-financial information that describes ESG factors, etc., to ensure that such information will be as useful as possible for users. It will be important for companies to respond to the TCFD recommendations from this perspective, as well.

- General Principle 3 [Ensuring appropriate information disclosure and transparency]

Companies should appropriately make information disclosure in compliance with the relevant laws and regulations but should also strive to actively provide information beyond that required by law. This includes both financial information, such as financial standing and operating results, and non-financial information, such as business strategies and business issues, risk and governance.

The board should recognize that disclosed information will serve as the basis for constructive dialogue with shareholders, and therefore ensure that such information, particularly non-financial information, is accurate, clear and useful.

- Basic policy (excerpt)

It has been noted that while the quantitative part of financial statements of Japanese companies conform to a standard format and therefore excel with respect to comparability, non-financial information, such as financial standing, business strategies, risks and ESG (environmental, social, and governance) matters, is often boiler-plate and lacking in detail, therefore less valuable. The board should actively commit to ensure that disclosed information, including non-financial information, is as valuable and useful as possible.

¹⁰ https://www.jpix.co.jp/english/news/1020/b5b4pj000000jvxxr-att/20180602_en.pdf

<Reference: Key institutional basis for the disclosure of climate-related information>

Japan has several institutional systems for disclosing climate-related information other than the Corporate Governance Code.

Legislation (year of establishment)	Summary
Act on Promotion of Global Warming Countermeasures (1998)	Since the 2005 revision of this Act, companies that emit above a certain amount of GHG are required to calculate their own GHG emissions and report them to the government. The Act on the Rational Use of Energy (Energy Conservation Law of 1979) also requires certain business operators to submit reports on energy consumption.
Law Concerning the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures. (2004)	An institutional framework has been established to promote the publication of environmental reports in order to promote the voluntary environmental efforts of business operators. In addition, major companies are obliged to make efforts to publish environmental reports.
Cabinet Office Ordinance on Disclosure of Corporate Affairs, etc. (2019)	Revisions of descriptions in securities reports to enhance financial and descriptive information. The revised descriptions include the impact of a risk on the business, the nature of the risk, the measures to be taken, the likelihood of materialization, and the extent and timing.

Column 4 Relationship with the “Guidance for Integrated Corporate Disclosure and Company-Investor Dialogue for Collaborative Value Creation”

METI published its “Guidance for Integrated Corporate Disclosure and Company-Investor Dialogue for Collaborative Value Creation: ESG Integration, Non-Financial Information Disclosure, and Intangible Assets into Investment” (hereinafter referred to as the “Guidance for Collaborative Value Creation”) in May 2017. The aims were to help deepen mutual understanding between companies and investors through information disclosure and dialogue and to encourage companies and investors to take action toward sustainable value creation. The Guidance for Collaborative Value Creation is expected to serve as a set of guidelines for business owners/managers seeking to manage their companies in ways that create corporate value, and to convey that information to investors. It is also designed as a guidance for investors that will enable them to grasp the information necessary to make investment decisions, etc. and assess companies from a medium- to long-term perspective, and to serve as reference for dialogue between investors and companies (Figure 6). The TCFD Guidance is positioned as an itemized discussion of the Guidance for Collaborative Value Creation focused on climate change.

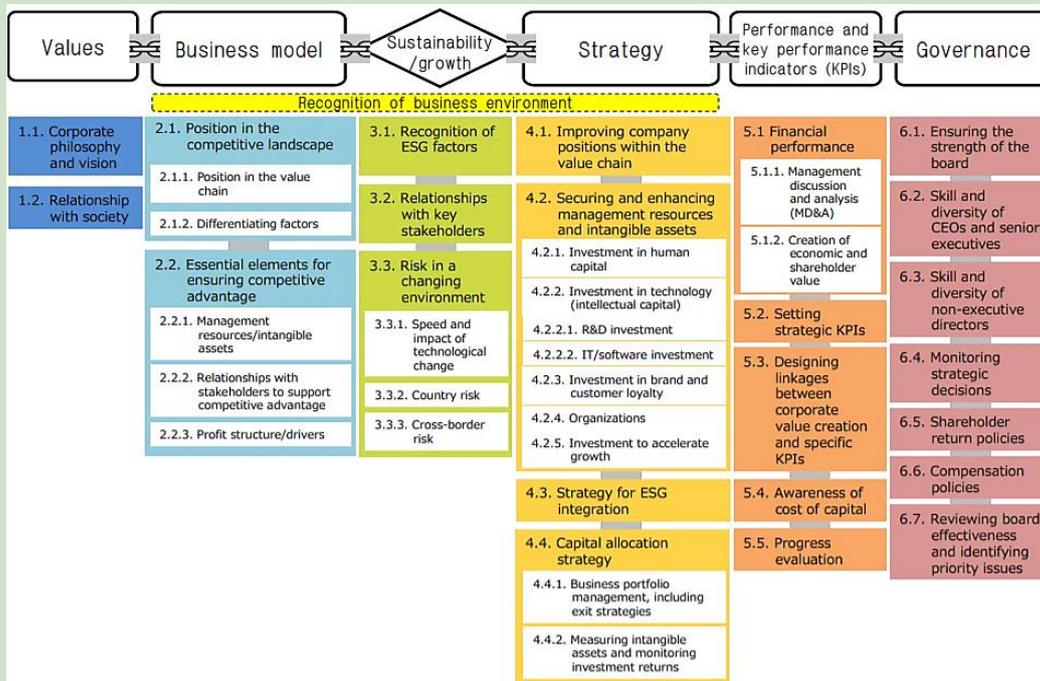


Figure 6 Overview of the Guidance for Integrated Corporate Disclosure and Company-Investor Dialogue for Collaborative Value Creation

Source: Guidance for Integrated Corporate Disclosure and Company-Investor Dialogue for Collaborative Value Creation ¹¹

¹¹ https://www.meti.go.jp/english/press/2017/0529_004.html

Column 5 Efforts to respond to the TCFD recommendations within other frameworks, standards, etc.

(1) CDP

CDP is an international NGO carrying on the work of its predecessor, the Carbon Disclosure Project, an initiative established in 2000. CDP sends questionnaires to companies to collect information outlining their corporate efforts related to the three environmental issues of climate change, water, and forests, and evaluates and analyzes the companies based on the responses obtained.

In 2018, CDP revised the questionnaire items to align them with the TCFD recommendations.

(2) Climate Disclosure Standards Board (CDSB)

An organization that promotes the disclosure of environmental, including climate change information in financial reports through the development of the CDSB Framework for reporting environmental and climate change information, which aims to standardize corporate environmental and climate change information disclosure. In April 2018, a revised version of the CDSB Framework was released to improve consistency with TCFD recommendations. In 2020, a guidance document was published on how to respond to the TCFD recommendations by utilizing CDP data and the CDSB Framework¹².

(3) Global Reporting Initiative (GRI)

An organization established to promote a wider understanding of the impacts of sustainability issues globally, and to help disseminate opinions about those impacts. The GRI Guidelines, published in 2000, are widely acknowledged as guidelines for sustainability reporting.

(4) International Integrated Reporting Council (IIRC)

IIRC was established in 2010 with the aims of improving the quality of the information received by providers of financial capital and establishing an approach for efficient information dissemination. The International Integrated Reporting Framework was published in 2013 to present an approach to preparing integrated reports. Since its publication, companies in Japan and elsewhere in the world have been transforming their annual reports into integrated reports.

Working in cooperation with organizations such as CDP, GRI, SASB, and CDSB, IIRC has established a project (Better Alignment Project) to improve consistency among the various frameworks used for corporate reporting. The project's initial goal was to align these

¹² CDSB, CDP, 2020, The building blocks: Connecting CDP data with the CDSB Framework to successfully fulfil the TCFD recommendations (<https://www.cdsb.net/buildingblocks>)

frameworks with the TCFD recommendations. As a result, the existing frameworks and standards were found to be generally aligned with the TCFD recommendations. While acknowledging that the development of a single reporting framework is difficult, the project has reported that there is room for improvement in comparability and consistency¹³.

(5) Sustainability Accounting Standards Board (SASB)

SASB presents metrics that can measure the long-term value creation capacity of companies in a total of 77 sectors. In addition to environmental metrics, SASB presents other sustainability-related metrics, including social and human capital metrics, and works toward the voluntary adoption of the standards in statutory disclosure materials by companies listed on U.S. markets.

In November 2018, SASB published new standards consistent with the TCFD recommendations which include industry-specific metrics and targets that can provide actionable information on climate risks.

SASB, in collaboration with the abovementioned CDSB, published a "TCFD Implementation Guide"¹⁴ providing commentary on TCFD, and the "TCFD Good Practice Handbook," a compilation of notable case examples of disclosure with explanatory commentary¹⁵.

(6) World Business Council for Sustainable Development (WBCSD)

WBCSD is a CEO-led organization of approximately 200 companies working toward sustainable development. Participating companies discuss their efforts to resolve issues related to sustainable development and share their experiences in cooperating with governments and NGOs.

WBCSD has established sector-specific "Preparer Forums" to explore ways to respond to the TCFD recommendations. Reporting guidance has already been published for the oil and gas, chemical, electric utilities, food, agriculture and forest products and construction and building materials sectors. Work on the automobile sector is underway.

¹³ Corporate Reporting Dialogue: Driving Alignment in Climate-related Reporting: Year One of the Better Alignment Project (<https://corporatereportingdialogue.com/publication/driving-alignment-in-climate-related-reporting/>)

¹⁴ Available for download from the CDSB website (https://www.cdsb.net/sites/default/files/sasb_cdsb-tcfd-implementation-guide-a4-size-cdsb.pdf) and from the SASB website (<https://www.sasb.org/knowledge-hub/tcfd-implementation-guide/>)

¹⁵ Available for download from the CDSB website (<https://www.cdsb.net/tcfd-good-practice-handbook>) and from the SASB website (<https://www.sasb.org/knowledge-hub/tcfd-good-practice-handbook/>).

Chapter 2 Commentaries on Disclosures in Accordance with the TCFD Recommendations

In formulating the TCFD Guidance, the working group established under the TCFD Study Group carried out a questionnaire survey of all of its members to enumerate the points they wanted to confirm in disclosing in line with the TCFD recommendations and identified the relevant issues. Later, in revising this Guidance, the TCFD Consortium identified issues related to information disclosure through further questionnaire surveys to consortium members and discussions in working groups.

Chapter 2 provides explanations of the above issues based on the discussions when the TCFD recommendations were formulated, information and opinions sought by financial institutions, and case examples that can be used as references for disclosure.

A. Introduction

The questions raised are broadly classified into those related to i) the medium of disclosure, ii) the four themes presented in the TCFD recommendations (Governance, Strategy, Risk Management, Metrics and Targets), iii) methods of financial disclosure for companies with diverse business models, and iv) steps for implementing the TCFD recommendations by mid-cap and small- and medium-sized companies.

Commentaries are provided on questions on the following topics in the order described in the TCFD recommendations:

- i) Medium of disclosure (See Section B.)
- ii) Four themes (See Sections C to F.)
- iii) Methods of financial disclosure for companies with diverse business models (See Section G.)
- iv) Steps for implementing the TCFD recommendations by mid-cap and small- and medium-sized companies (See Section H.)

B. Medium of Disclosure

The TCFD recommends that “preparers of climate-related financial disclosures provide such disclosures in their mainstream (i.e., public) annual financial filings¹⁶.”

2. Implementing the Recommendations

b. Location of Disclosures and Materiality

The Task Force recommends that organizations provide climate-related financial disclosures in their mainstream (i.e., public) annual financial filings. In most G20 jurisdictions, public companies have a legal obligation to disclose material information in their financial filings — including material climate-related information; and the Task Force’s recommendations are intended to help organizations meet existing disclosure obligations more effectively. The Task Force’s recommendations were developed to apply broadly across sectors and jurisdictions and should not be seen as superseding national disclosure requirements. Importantly, organizations should make financial disclosures in accordance with their national disclosure requirements. If certain elements of the recommendations are incompatible with national disclosure requirements for financial filings, the Task Force encourages organizations to disclose those elements in other official company reports that are issued at least annually, widely distributed and available to investors and others, and subject to internal governance processes that are the same or substantially similar to those used for financial reporting.

The Task Force recognizes that most information included in financial filings is subject to a materiality assessment. However, because climate-related risk is a non-diversifiable risk that affects nearly all industries, many investors believe it requires special attention. For example, in assessing organizations’ financial and operating results, many investors want insight into the governance and risk management context in which such results are achieved. The Task Force believes disclosures related to its Governance and Risk Management recommendations directly address this need for context and should be included in annual financial filings.

For disclosures related to the Strategy and Metrics and Targets recommendations, the Task Force believes organizations should provide such information in annual financial filings when the information is deemed material. Certain organizations—those in the four non-financial groups that have more than one billion U.S. dollar equivalent (USDE) in annual revenue—should consider disclosing such information in other reports when the information is not deemed material and not included in financial filings.³⁷ Because

¹⁶ Financial filings refer to the annual reporting packages in which organizations are required to deliver their audited financial results under the corporate, compliance, or securities laws of the jurisdictions in which they operate. (Excerpts from Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures, June 2017).

these organizations are more likely than others to be financially impacted over time, investors are interested in monitoring how these organizations' strategies evolve.

Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.17.

Among the four thematic areas, the TCFD recommendations stipulate that it is desirable for all companies to make disclosures related to Governance and Risk Management in their financial filings, as described above. Disclosure is recommended by all companies because many investors believe that almost all industries are potentially exposed to the impacts of climate change. TCFD recommends the disclosure to be included in financial filings because financial filings are the information resource most frequently referenced by investors and other stakeholders.

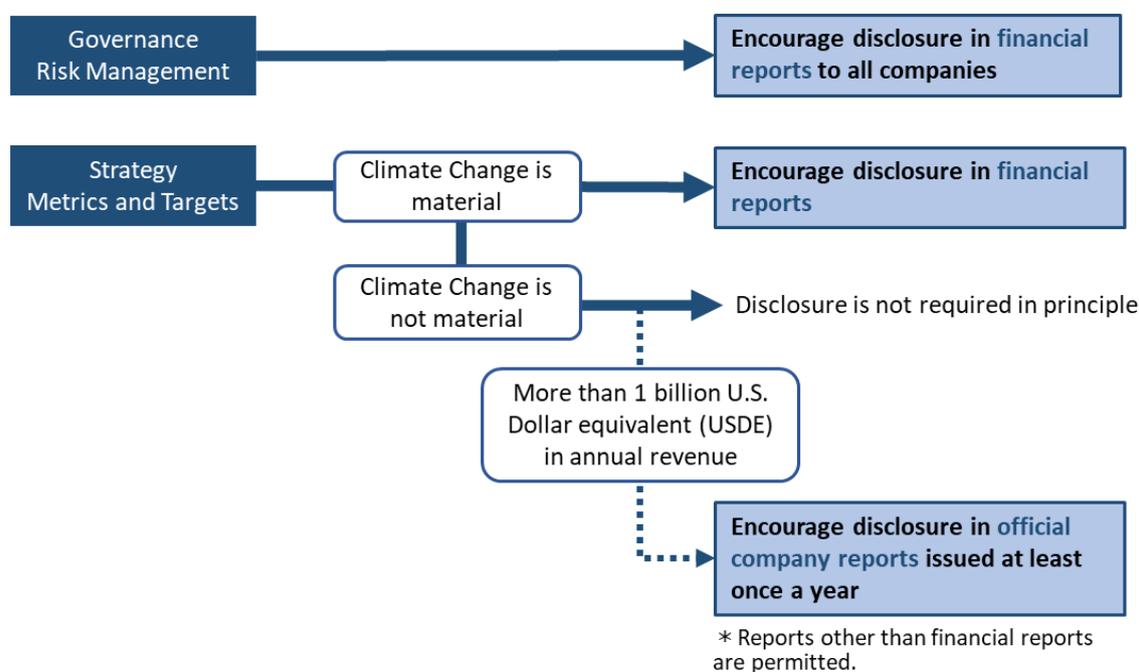


Figure 7 Recommended disclosure medium in the TCFD recommendations

For disclosures related to the Strategy and Metrics and Targets, the TCFD recommendations stipulate that companies should provide the information in financial filings when the information is deemed to be material. Among companies that currently see such information as largely immaterial, large companies (i.e., those¹⁷ in the non-financial group with annual revenue exceeding a one billion U.S. dollar equivalent (USDE)) should consider disclosing the information in other reports, since for these organizations the information may become material in the future.

¹⁷ The threshold value selected for the TCFD recommendation was \$1 billion in annual sales, as the organizations reaching that threshold accounted for more than 90% of GHG emissions in Scope 1 and Scope 2 for four non-financial groups (approximately 2,250 issues out of approximately 15,000).

The TCFD recommendations, on the other hand, state that “The Task Force’s recommendations were developed to apply broadly across sectors and jurisdictions and should not be seen as superseding national disclosure requirement. Importantly, organizations should make financial disclosures in accordance with their national disclosures. If certain elements of the recommendations are incompatible with national disclosure requirements for financial filings, the Task Force encourages organizations to disclose those elements in other official company reports that are issued at least annually¹⁸.”

The above is an explanation of the medium of financial disclosure in the TCFD recommendations. Note that the “scenarios,” as described in c) under Strategy in the TCFD recommendations (P.25), are “hypothetical constructs and not designed to deliver precise outcomes or forecasts.” A major issue yet to be determined is whether such information based on an uncertain and long-term outlook should be included in financial filings.

Disclosure in accordance with the TCFD recommendations is being developed on this point. Disclosure practices for effective information provision to investors and other stakeholders is expected be refined with the accumulation of case examples. In the process of accumulating case examples, a review of the medium of climate-related financial disclosure, including the scenario analysis, is expected to progress further.

The following are examples of combinations of disclosure media by major companies that conduct climate-related scenario analysis, as of July 2020. For the foreseeable future, disclosures drawing upon earlier examples such as those shown below are expected to accumulate.

¹⁸ Excerpts from P.17 of “Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures”

Case example 1

Combinations of disclosure media for scenario analysis

Company Name	Financial report	Other reports
BHP Billiton	In its annual report, the company mentions that a scenario analysis is conducted and invites readers to refer to the individual report (Portfolio Analysis) for details.	The details of the scenario analysis are provided in the individual report (Portfolio Analysis).
Shell	In its annual report, the company mentions that a scenario analysis is conducted, cites the results of its proprietary Sky Scenario, and invites readers to refer to the sustainability report for details on the company's responses to the TCFD recommendations.	In its sustainability report, the company mentions that it conducts a scenario analysis. The details of scenario analysis are included in the individual report (Shell Energy Transition Report) and the company's website.
Eni	In its annual report, the company mentions that a scenario analysis is conducted. It also partially describes the difference between the IEA SDS scenario and its own scenario.	Only an outline of the scenario analysis is included in the sustainability report. The details of the scenario analysis are described in another report (Path to Decarbonization)
Rio Tinto	In its annual report, the company mentions that a scenario analysis is conducted and invites readers to refer to the Climate Change Report on its responses to the TCFD recommendations.	The details of the scenario analysis are described in the company's Climate Change Report (Our Approach to Climate Change) .
Marui Group, Inc.	The company's annual securities report describes the measures taken in line with each item of the TCFD recommendations. Regarding the "Co-Creation Sustainability Management" of the Group, the securities report refers to the company's "Co-Creation Management Report" and "VISION BOOK 2050".	The details of the scenario analysis and estimations of financial impacts are described in the "Co-Creation Management Report."
Sekisui House, Ltd.	In its annual securities report, the company states that a "TCFD Report 2019" has been issued.	The company's "TCFD Report 2019" describes its response to the TCFD recommendations and the detailed results of a scenario analysis.

Source: Prepared from the disclosure media and websites of the respective companies

As shown above, the companies use various disclosure mediums besides financial filings, such as integrated reports and sustainability reports. For this reason, companies will need to appropriately combine such reports in order to effectively provide information to investors and other stakeholders. Several examples of disclosure mediums other than financial filings are described below.

1. Integrated report, annual report¹⁹

These are reports that compile both corporate financial information and non-financial information, including sustainability-related information. The available guidelines for integrated reports include the “Guidance for Collaborative Value Creation” developed by METI, and the “International Integrated Reporting Framework” formulated by IIRC. The preparation of an integrated report and annual report is voluntary.

2. Environmental report, sustainability report, CSR report, etc.

These are voluntary disclosure mediums for the disclosure of non-financial information, including details on an entity’s efforts towards realizing a sustainable society. As sustainability reporting guidelines, a set of GRI Standards developed by GRI are available. The preparation of an environmental report, sustainability report, CSR report, etc. is also voluntary.

According to the TCFD Consortium's questionnaire survey of member companies, financial institutions obtain information from multiple media, such as corporate websites, environmental reports, and sustainability reports, in addition to integrated reports (Figure 8).

¹⁹ In Japan, the term “annual report” describes a voluntary disclosure report. Overseas, however, this term sometimes describes statutory disclosure documents, as in the case of the “Annual Report and Accounts” in the U.K.

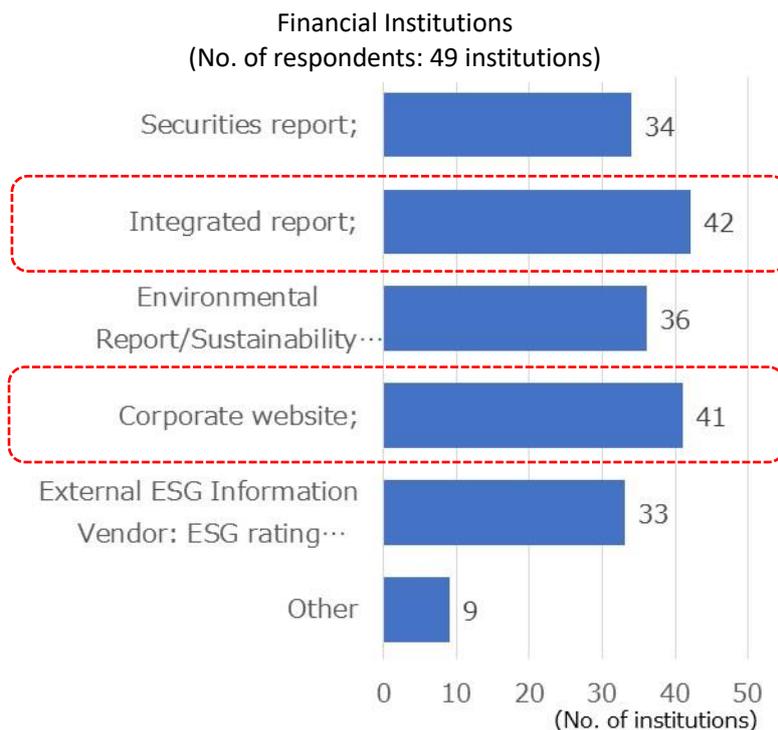


Figure 8 Media Used by Financial Institutions Use to Obtain Information on investee companies

Source: TCFD Consortium

From the viewpoint of preparers, it was also found that companies also disclose climate information in multiple media, such as in integrated reports, environmental and sustainability reports, and corporate websites (Figure 9).

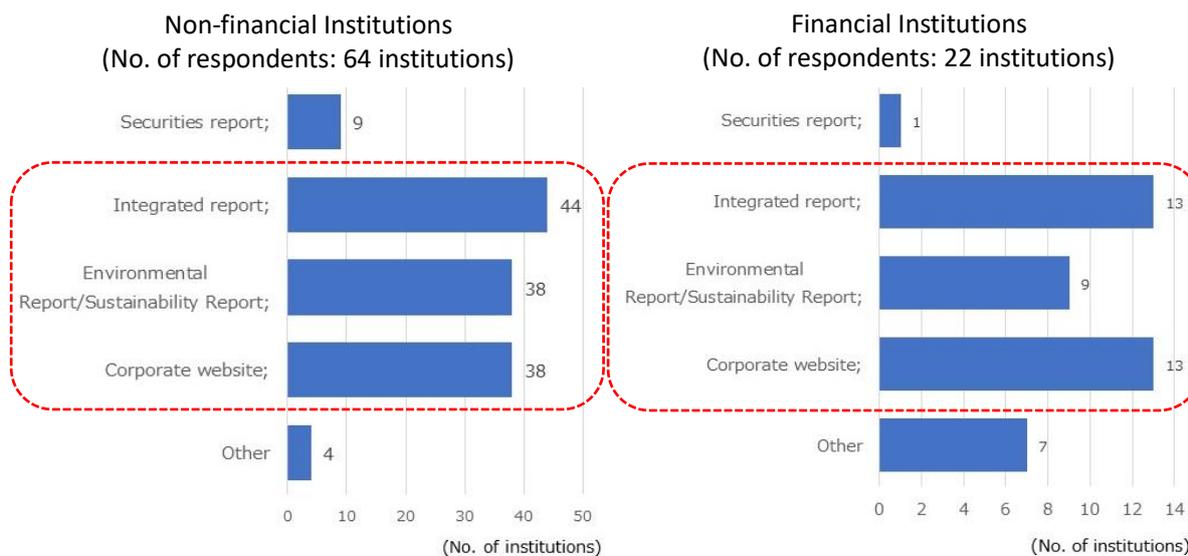


Figure 9 The medium in which the information according to TCFD recommendations are disclosed

Source: TCFD Consortium

The TCFD recommendations do not present a specific format for climate-related disclosure.

When a company discloses information in financial filings, integrated reports, sustainability report, or the like, a key step is to demonstrate the relationship between the information disclosed in these reports and the recommended structure of disclosures presented by the TCFD recommendations.

How this relationship is to be demonstrated is left to the inventiveness of each company. In one helpful case example, a company adds a mapping table to show the connections between the relevant content of the disclosure and each element of the TCFD recommendations (case example (2)). In another, a company describes the method used to follow the structure of the TCFD recommendations (case example (3)).

Case example 2

A mapping table of the content of TCFD-related disclosures and their location in the report.

Nippon Steel uses a mapping table to show where all the 11 items recommended for disclosure in the TCFD recommendations can be found in its Sustainability Report.

[For reference] TCFD's recommendations and supporting recommended disclosures

TCFD's recommendations and supporting recommended disclosures	Reference page
[Governance] Disclose the organization's governance related to climate-related risks and opportunities.	
a) Describe the board's oversight of climate-related risks and opportunities.	p. 18
b) Describe management's role in assessing and managing climate-related risks and opportunities.	p. 18
[Strategy] 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.	
a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	p. 24
b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	p. 24
c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	p. 24
[Risk Management] Disclose how the organization identifies, assesses, and manages climate-related risks.	
a) Describe the organization's processes for identifying and assessing climate-related risks	p. 18
b) Describe the organization's processes for managing climate-related risks.	p. 18
c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	p. 18
[Metrics and Targets] Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	
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. 13
b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	pp. 20, 22
c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	p. 13

¹ Source for EV-related data: IEA ETP2017

EVs only refer to battery electric vehicles (BEVs) with no internal combustion engine (ICE). ICEVs include plug-in hybrid vehicles (PHEVs).

² The ratio of the use of the EAF route is calculated from the estimated crude steel production in the JISF's paper "A challenge towards zero-carbon steel."

Source: Nippon Steel Co., Ltd. "Sustainability Report 2019" P. 25

Case example 3 Disclosure following the structure of the TCFD recommendations

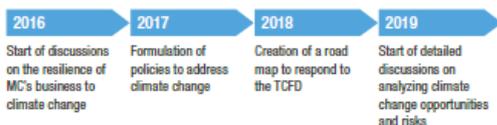
Mitsubishi Corporation provides an executive summary of its response to the TCFD recommendations in its integrated report. In addition, the company describes the status of its response to the TCFD recommendations for each of the four thematic areas (governance, strategy, risk management, metrics and targets) in its ESG DATA BOOK 2019.

Addressing Climate Change

Governance

- As one important management issue, the Executive Committee determines basic policies and other important matters, and reports these to the Board of Directors on an annual basis.
- The Sustainability & CSR Committee discusses matters including the evaluation of opportunities and risks related to climate change as well as their reflection into business strategies.
- Specifically, discussions focus on (1) policies around climate-related initiatives through business and (2) policies for addressing the TCFD and others. In addition, the key issues of (1) methods to evaluate climate change risks and opportunities (including scenario analysis) and (2) GHG reduction targets (including the status of reductions) are also discussed.

Initiatives to Date



Risk Management

- Key opportunities and risks are evaluated and determined by the Sustainability & CSR Committee, in which all Business Group CEOs participate in discussions.
- The opportunities and risks that are assessed and determined are managed under the Sustainability Promotion Framework*3.



- 1 Survey**
 - Sustainability survey (of business investees)
 - External trend survey
- 2 Assessment and Identification**
 - Assesses key business opportunities and risks identified by the Committee through scenario analysis
- 3 Management**
 - Reflect assessment in strategic terms through the Sustainability Promotion Framework
 - Manage aspects of individual businesses through investment and loan screening

*3 Subjects for consideration by the above process include incorporation of transition risks, physical risks and business opportunities.

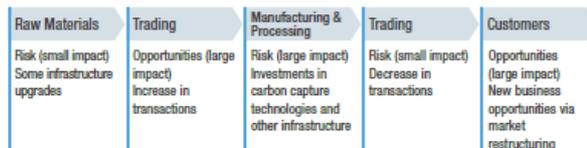
Strategies

- MC considers the various opportunities and risks associated with climate change to be an important perspective in determining business strategies.

Scenario Analysis

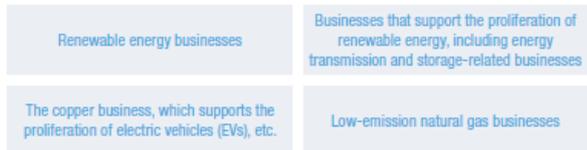
- Based on the demand outlook (expressed in five levels) for various scenarios (based on the World Energy Outlook and Energy Technology Perspectives of the IEA*2, etc.) in the main business sectors that could be affected by climate change, MC is formulating an awareness of the business environment along with related policies and initiatives.
- Moreover, after identifying businesses of major financial and non-financial importance according to each scenario, MC is performing a climate change opportunity and risk analysis for each element in the value chain.

*2 The International Energy Agency (IEA)



Main Business Initiatives

- With the goal of contributing to the transition to a low-carbon society, MC is promoting the following businesses.



Indicators and Targets

- **By 2030 aim to reduce greenhouse gas emissions per total assets*4 by 25%*5.**
- **By 2030 aim to achieve at least 20% renewable energy in MC's power generation business (based on generation amount).**

*4 The total assets used for this target represent the numerical values within the emissions reporting calculation range, which differ from the total assets reported in MC's financial reports.

*5 Compared to levels in the fiscal year ended March 31, 2017. Greenhouse gas emissions on a consolidated basis (MC on a non-consolidated basis plus subsidiaries).

Source: Mitsubishi Corporation "Integrated Report 2019" P.44

Utilizing the TCFD Recommendations to Capture Business Opportunities and Mitigate Risks

Due to the high degree of uncertainty surrounding the impacts of climate change, MC has adopted a flexible portfolio capable of adapting to medium to long-term changes in its operating environment. MC believes it is vital to capture business opportunities associated with climate change and take appropriate action to mitigate risks.

The TCFD provides business entities and investors with guidelines on voluntary climate-related financial disclosures and information useful for their decision making. MC utilizes these TCFD

■ Governance

Climate change is one of the most important issues acknowledged by MC's top management. MC's basic policy on climate change and important matters therein are deliberated and decided upon by its Executive Committee, the company's officer-level decision-making body.

As stipulated in the regulations governing MC's board of directors, the Executive Committee reports its findings regularly (at least once a year) to the board, appropriate supervision of which is facilitated by the structure of MC's governance framework. Before

Board of Directors and Executive Committee Deliberations and Reports

Basic Policy on Climate Change
Covers climate-related initiatives through the company's business, adoption of TCFD recommendations, details on climate-related financial disclosures, etc.

Important Matters
Assessments of climate-change risks and business opportunities (including scenario analyses), greenhouse-gas reduction targets and action plans, etc.

■ Initiatives to Date



data as benchmarks for verifying its own climate-related action plans, identifying growth opportunities, and strengthening risk management in ways that are designed to ensure its sustainable growth.

Portions of the TCFD's recommendations are still in the discussion stages, and others may take several years before action can be taken. Nevertheless, MC will disclose its efforts in a stepwise fashion to strengthen its information disclosure.

the Executive Committee has addressed basic policy and important matters pertaining to climate change, actions are taken by MC's Sustainability Advisory Committee and Sustainability & CSR Committee. The former fields opinions and advice from outside experts, and the latter (which reports directly to the Executive Committee) holds extensive hearings with all of the Business Group CEOs.

The Business Groups also act independently to address climate change. Group Chief Sustainability Officers and Group Sustainability Managers are appointed within each Group's department responsible for management strategy in order to oversee sustainability-related initiatives (including climate change) and reflect climate-related opinions and information into their respective businesses and strategies.

At MC, the company's basic policy on climate change and important matters therein are comprehensively addressed when making decisions on business strategies and investments.

Climate-Change Governance Structure

Board of Directors	Supervises MC's climate-related actions and initiatives	Convenes approx. once per year
Executive Committee	Makes decisions regarding MC's basic policy on climate change	Convenes approx. 2-3 times per year
Sustainability & CSR Committee (Reports directly to Executive Committee)	Deliberates on MC's basic policy on climate change and important matters therein, and reports findings to Executive Committee	Convenes approx. 2-3 times per year
Sustainability Advisory Committee	Offers advice and recommendations regarding MC's basic policy on climate change and important matters therein	Convenes approx. twice per year
Officer in Charge	Masakazu Sakakida (Member of the Board, Executive Vice President, Corporate Functional Officer, Corporate Sustainability & CSR, Corporate Administration, Legal (Concurrently) Chief Compliance Officer)	
Department in Charge	Corporate Sustainability & CSR Department	

Reference: Diagram of the Sustainability Promotion Framework

■ Strategy

MC considers the opportunities and risks associated with climate change to be key variables in establishing its business strategies, and recognizes the possibility that the impact of climate change on its operations will grow over the medium to long term. Accordingly, MC is identifying where the risks and opportunities are likely to reveal themselves up to and even beyond the year 2030. Regular internal analyses and assessments also factor in changing external trends.

Main Opportunities and Risks Associated with Climate Change

Transition Risks and Opportunities

Regulations	<ul style="list-style-type: none"> Low-carbon and carbon-free products / proliferation of service-related subsidies Growing operational and systems-related costs due to carbon pricing mechanisms (carbon taxes, etc.) and increasing regulations
Technologies	<ul style="list-style-type: none"> More new business opportunities due to the development and proliferation of renewable energy sources, electric vehicles and other new technologies or alternative products Obsolescence of products and services that rely on older technologies
Markets	<ul style="list-style-type: none"> Shifting demand from fossil-fuel products and services to low-carbon products and services

Physical Risks

Increase in Unusual Weather Patterns	<ul style="list-style-type: none"> Risks of water shortages, floods and other resulting phenomena having an adverse impact on business operations
Climate Change	<ul style="list-style-type: none"> Risk of rising temperatures, etc. having an adverse impact on agricultural and marine products

* The impacts of the above risks and opportunities will depend on both the relevant regions and products.
 * With respect to physical risks, it is important to consider environmental changes (or possibilities thereof) on a region-by-region or product-by-product basis. Accordingly, MC's responses to phenomena such as floods and water shortages are tailored to the on-the-ground characteristics and needs of each of its businesses.

Source: Mitsubishi Corporation "ESG DATA BOOK 2019" PP. 30 - 31

C. Governance

The TCFD recommendations recommend the following disclosures under Governance.

Governance: Disclose the organization's governance around climate-related risks and opportunities.	
<p>Recommended Disclosure a)</p> <p>Describe the board's oversight of climate related risks and opportunities.</p>	<p><u>Guidance for All Sectors</u></p> <p>In describing the board's oversight of climate-related issues, organizations should consider including a discussion of the following:</p> <ul style="list-style-type: none"> • processes and frequency by which the board and/ or board committees (e.g. audit, risk, or other committees) are informed about climate-related issues. • whether the board and / or committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well 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
<p>Recommended Disclosure b)</p> <p>Describe management's role in assessing and managing climate-related risks and opportunities</p>	<p><u>Guidance for All Sectors</u></p> <p>In describing management's role related to the assessment and management of climate-related issues, organizations should consider including the following information:</p> <ul style="list-style-type: none"> • 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) • processes by which management is informed about climate-related issues • how management (through specific positions and / or management committees) monitors climate-related issues

Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.19.

Commentaries

Generally speaking, the board has the authority to supervise the execution of duties of individual directors. The TCFD recommends the board to supervise climate-related issues and disclose the supervisory structure for the same.

In recommended disclosure b), the TCFD recommendations mention the term “management-level positions.” The term in this context, however, refers not to the personnel with positions responsible for managing the workplace according to labor laws, etc., but to the executive-level personnel given the practical responsibility of assessing and managing climate-related issues by companies.

As issues of interest to investors, the TCFD recommendations mention the role of the board in providing oversight on the response to climate change, and the role of management in assessing and managing the risks and opportunities of climate change. An important step, in responding to the interests of investors, is to show the effectiveness of the organizational structure by demonstrating, for example, how discussions on climate change are conducted and whether such discussions are reflected in management. This is to be done by disclosing not only the organizational structure, including the positioning and roles of the Environmental Committee and the Sustainability Committee headed by the Board of Directors and the top management, but also the specific roles of the constituent organizations and managers, and the process by which the discussions are reflected in management.

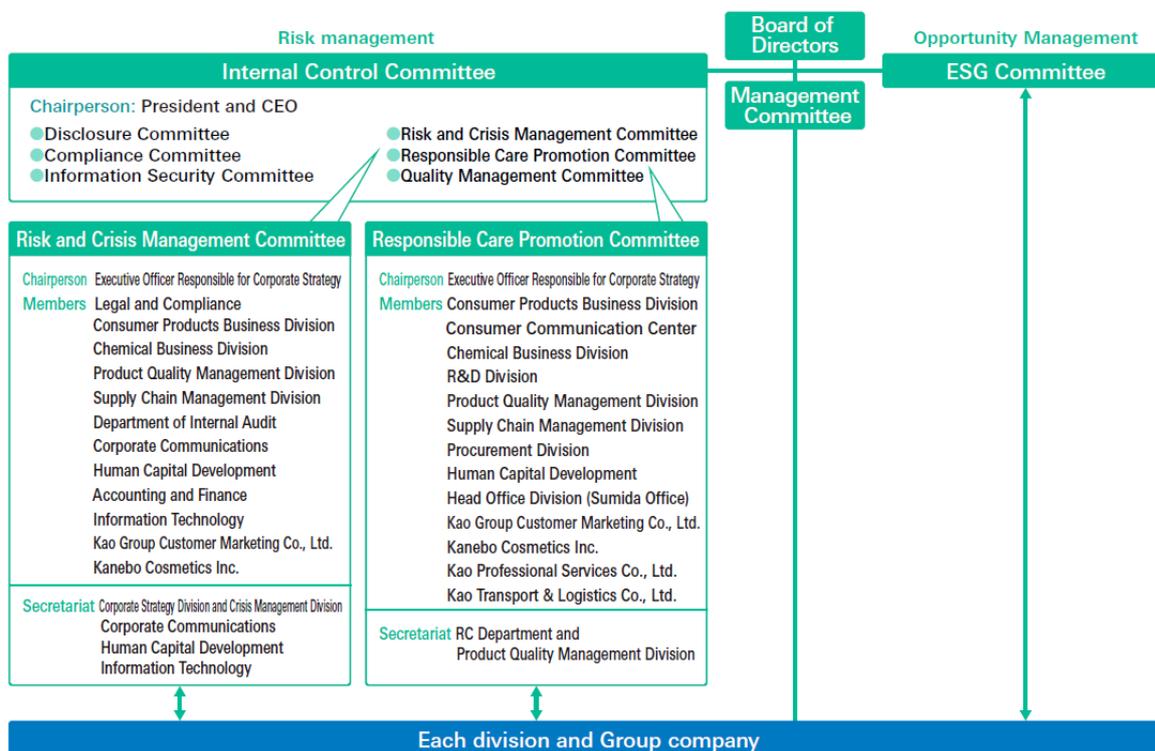
The following is a representative case example of governance disclosures related to climate-related issues.

Case example 4

Establishing committees and promoting activities related to climate change

Kao Corporation has established an ESG Committee under its Board of Directors to discuss and determine the direction of activities related to its ESG strategy. The ESG Committee is responsible for managing opportunities related to climate change issues, while the Internal Control Committee is responsible for risk management under the supervision of the Board of Directors. The company reports that the ESG Committee meets four times a year and the Internal Control Committee meets at least once a year.

Decarbonization promotion structure



* As of December 2019.

Source: Kao Corporation "Kao Sustainability Data Book 2020" P. 86

D. Strategy

The TCFD recommendations recommend the following disclosures under Strategy.

Strategy: 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.	
Recommended Disclosure a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	<u>Guidance for All Sectors</u> Organizations should provide the following information: <ul style="list-style-type: none"> • a description of what they consider to be the relevant short-, medium-, and long- term time horizons, taking into consideration the useful life of the organization's assets of infrastructure and the fact climate-relate issues often manifest themselves over the medium and longer terms. • a description of the specific climate-related issues for each time horizon (short, medium, and long term) that could have a material financial impact on the organization • a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization. Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate.
Recommended Disclosure b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	<u>Guidance for All Sectors</u> Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning. Organizations should consider including the impact on their businesses and strategy in the following areas: <ul style="list-style-type: none"> • Products and services • Supply chain and/or value chain • Adaptation and mitigation activities • Investment in research and development • Operations (including types of operations and location of facilities) Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to

	<p>create value over time.</p> <p>Organizations should also consider including in their disclosures the impact on financial planning in the following areas:</p> <ul style="list-style-type: none"> • Operating costs and revenues • Capital expenditures and capital allocation • Acquisitions or divestments • Access to capital <p>If climate-related scenarios were used to inform the organization’s strategy and financial planning, such scenarios should be described.</p>
<p>Recommended Disclosure c)</p> <p>Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2 °C or lower scenario.</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should describe how resilient their strategies are to climate related risks and opportunities, taking into consideration a transition to a lower-carbon economy consistent with a 2 °C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.</p> <p>Organizations should consider discussing:</p> <ul style="list-style-type: none"> • 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 • the climate-related scenarios and associated time horizon(s) considered

Source: “Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), PP. 20-21.

Commentaries

The relationship between the three categories of a), b), and c) in the above guidance can be characterized follows.

First, with regard to the relationship between recommended disclosures a) and b), recommended disclosure a) requires organizations to identify short-, medium-, and long-term risks and opportunities (regardless of whether or not a scenario analysis is conducted), while recommended disclosure b) requires organizations to explain the impacts of climate-related issues on businesses, strategies, and financial planning based on such risks and opportunities.

Second, with regard to recommended disclosure c), the scenario analysis mentioned herein also includes elements of recommended disclosures a) and b). Therefore, organizations implementing recommended disclosure c) also satisfy recommended disclosures a) and b).

Important points at issue for recommended disclosures a), b), and c) are respectively explained below.

(1) Description of recommended disclosure a)

The TCFD's recommended disclosure a) under Strategy encourages organizations to explain specific climate-related issues that would have material financial impacts in short-, medium-, and long-term time frames.

<p>Recommended Disclosure a)</p> <p>Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should provide the following information:</p> <ul style="list-style-type: none"> • a description of what they consider to be the relevant short-, medium-, and long- term time horizons, taking into consideration the useful life of the organization's assets of infrastructure and the fact climate-relate issues often manifest themselves over the medium and longer terms. • a description of the specific climate-related issues for each time horizon (short, medium, and long term) that could have a material financial impact on the organization • a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization. <p>Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate.</p>
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Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.20.

For specific context on short-, medium- and long-term time frames, the descriptions in “8. Timeframes for the short, medium, and long term” in “E. Key Issues Considered and Areas for Future Work” in the TCFD recommendations serve as a useful reference.

8. Time Frames for Short, Medium, and Long Term

As part of the Task Force’s second public consultation, some organizations asked the Task Force to define specific ranges for short, medium, and long term. Because the timing of climate-related impacts on organizations will vary, the Task Force believes specifying time frames across sectors for short, medium, and long term could hinder organizations’ consideration of climate-related risks and opportunities specific to their businesses. The Task Force is, therefore, not defining time frames and encourages preparers to decide how to define their own time frames according to the life of their assets, the profile of the climate-related risks they face, and the sectors and geographies in which they operate.

In assessing climate-related issues, organizations should be sensitive to the time frames used to conduct their assessments. While many organizations conduct operational and financial planning over a 1-2-year time frame and strategic and capital planning over a 2-5-year time frame, climate-related risks may have implications for an organization over a longer period. It is, therefore, important for organizations to consider the appropriate time frames when assessing climate-related risks.

Source: “Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), P.38.

The second paragraph states that climate-related risks “may have implications for an organization over a longer period” and “it is, therefore, important for organizations to consider the appropriate time frames when assessing climate-related risks.” What can be interpreted as an appropriate time frame depends on the climate-related risks and opportunities that are expected to have impact. The physical risks posed by climate change and the innovations on low-carbon technologies, however, encompass issues that will take much longer to address than is allowed within the time frames envisaged in the operating and financial plans or strategic and capital plans. Furthermore, the year 2050 is attracting attention as a milestone for climate change measures: the IPCC reports envisage substantial reductions by 2050, and many countries set 2050 as a target year in their long-term climate strategies. Existing materials to read in establishing such a long-term time frame may include, for example, reports on scenarios such as the International Energy Agency (IEA) for transition risks (See **Reference 1**), or information on physical risks such as reports by international organizations that consider the impacts by industry and region (See **Reference 2**).

Reference 1: Overview of available IEA scenarios that can be used when assessing transition risk

IEA World Energy Outlook (WEO): The World Energy Outlook is IEA's annual long-term energy-related forecast and flagship report. WEO 2019, the most recent issue as of the publication of this Guidance, forecasts energy consumption by region, sector, and energy source through 2040. There are three scenarios: Current Policies Scenario, Stated Policies Scenario, and Sustainable Development Scenario. The Sustainable Development Scenario incorporates emissions reductions consistent with the Paris Agreement, as well as the achievement of other objectives related to universal energy access and cleaner air by 2030.

IEA Energy Technology Perspectives (ETP): Energy Technology Perspectives provides future projections focusing on energy technologies by IEA. These IEA perspectives project energy consumption by region, sector, and energy source over longer periods than are covered under the WEO projections (up to 2060). According to IEA, a series of three ETP scenarios were prepared to complement those explored in the WEO: Reference Technology Scenario (RTS), 2 Degrees Scenario (2DS), and Beyond 2 Degrees Scenario (B2DS). The most recent version of the ETP as of the publication of this Guidance was published in 2017, though a new ETP with improved consistency with the WEO is scheduled to be published in September 2020.

Reference 2: Information on scenarios that can be used when assessing physical risk

“Advancing TCFD Guidance on Physical Climate Risks and Opportunities,” published by the European Bank for Reconstruction and Development (EBRD) in 2018, examines indicators related to physical risks and resilience (opportunities) and assesses physical risks such as extreme rainfall, floods, and sea level rises at three levels according to industries.

(2) Description of recommended disclosure b) (how to disclose efforts in research and development)

The TCFD's recommended disclosure b) under Strategy encourages organizations to explain the implications of climate-related issues for their businesses, strategies, and financial planning.

<p>Recommended Disclosure b)</p> <p>Describe the impact of climate related risks and opportunities on the organization's businesses, strategy, and financial planning.</p>	<p><u>Guidance for All Sectors</u></p> <p>Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning.</p> <p>Organizations should consider including the impact on their businesses and strategy in the following areas:</p> <ul style="list-style-type: none"> • Products and services • Supply chain and/or value chain • Adaptation and mitigation activities • Investment in research and development • Operations (including types of operations and location of facilities) <p>Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time. Organizations should also consider including in their disclosures the impact on financial planning in the following areas:</p> <ul style="list-style-type: none"> • Operating costs and revenues • Capital expenditures and capital allocation • Acquisitions or divestments • Access to capital <p>If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.</p>
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Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017) P.20.

As shown above, the TCFD recommendations list the following as areas in which climate-related risks and opportunities affect the businesses and strategies of organizations: “products and services,” “supply chain and/or value chain,” “adaptation and mitigation activities,” “investment in research and development,” and “operations (including types of operations and the locations of facilities).”

Among the items mentioned above, “investment in research and development” was the most frequent topic of questions posed through the TCFD Study Group. Furthermore, recent guidance documents indicate that opportunities, as well as risks, are important for climate-related information²⁰. The “Green Investment Guidance” states that innovation, including research and development, makes up an important part of company efforts to take advantage of climate-related opportunities, and describes the importance of understanding and evaluation of innovation by investors and other stakeholders. For these reasons, “investment in research and development” is explained below.

When discussing investment in research and development, companies should describe why such research and development activities are necessary in relation to the future risks and opportunities they have identified. In particular, companies should actively describe their efforts when investing in research and development activities that contribute significantly to GHG emission reductions, such as efforts for energy-efficiency and the effective utilization of CO₂ emitted. There is a growing international discussion on finance for initiatives that contribute to a transition towards the realization of the goals of the Paris Agreement. The International Capital Markets Association (ICMA) has established a working group on transition finance to discuss the issue (See Column 6). Since it is important, with respect to transition finance, that companies explain their strategies etc. on transition, active information disclosure is useful from the perspective of obtaining such finance.

Another important step, from the perspective of addressing physical risks, is to conduct research and development focused on issues such as business continuity in times of extreme weather events (e.g., maintaining supply chains, ensuring stable supply of energy), stable procurement of water, stable supply of food, and so on.

When disclosing specific research and development activities, companies should describe the total spending on research and development activities, the budget allocations by theme, the outcomes achieved through the commercialization of such technologies (e.g., contribution to revenues, reduction of CO₂ emissions), and the relationships between research and development activities and the outcomes. Disclosing such information will help clarify the significance of research and development in companies, and as a result, investors will be able to understand the long-term strategy of companies and the direction of innovation initiatives.

²⁰ “Whilst many investors are considering climate-related issues predominantly through a risk lens, they also want to understand opportunities.” (FRC, 2019, Climate-related corporate reporting – Where to next? P.13)

²¹ “Companies that invest in reducing their carbon emissions and in capitalizing on opposites presented by the transition will strengthen their position.” (WBCSD TCFD Chemical Sector Preparation Forum, 2019, Climate-related financial disclosure by chemical sector companies: Implementing the TCFD recommendations, P.9)

The significance of basic research and development efforts, meanwhile, can be to some degree clarified by describing the awareness of issues behind such efforts, as well as areas of technology that will be potentially impacted by the research and development in the future.

Another effective way companies can show their active engagement in innovation related to climate change is to participate in innovation-related initiatives by the government and industry associations, and to actively disseminate information on the same. (See Column 7)

Case example 5

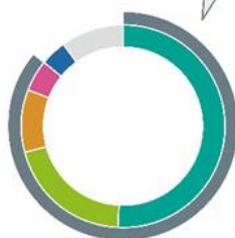
Clarifying the breakdown of research and development expenditures and the roadmap to the commercialization of technologies

Sumitomo Chemical Co., Ltd. discloses its total expenditures on research and development, capital investment, and investments and loans, along with its allocations of spending by theme, for the past three years.

2019～2021年度 FY2019-FY2021

研究開発費
R&D Expenditures

5,400億円 ¥540 billion

スペシャルティケミカル
Specialty Chemicals 90%

■ バルクケミカル(石油化学) ■ エネルギー・機能材料 ■ 情報電子化学 ■ 健康・農業関連事業 ■ 医薬品 ■ 本社・共通
■ Bulk Chemicals (Petrochemicals & Plastics) ■ Energy & Functional Materials ■ IT-related Chemicals ■ Health & Crop Sciences ■ Pharmaceuticals ■ Head office and admin.

2019～2021年度 FY2019-FY2021

設備投資・投融資
Capital Expenditures,
Investments and Loans

(意思決定ベース) 7,000億円

(Decision-making basis) ¥700 billion

スペシャルティケミカル
Specialty Chemicals 70%

Source: Sumitomo Chemical Co., Ltd. "Investor's Handbook 2019" P.9

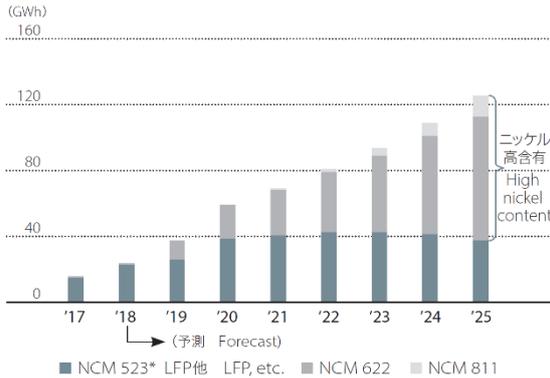
The company also describes future opportunities related to cathode material, the main component of lithium-ion batteries, in relation to future market trends and the company's development schedule, and clarifies its timeline for developing next-generation products and the timing of market launches in response to future demand estimates.

正極材 Cathode Materials

正極材の市場トレンド
Cathode Materials Market Trends

高容量電池搭載のEV需要伸長に伴い、車載用二次電池向け正極材の需要拡大
Growth in demand for cathode materials for automotive secondary batteries in line with growth in demand for EVs equipped with high-capacity batteries

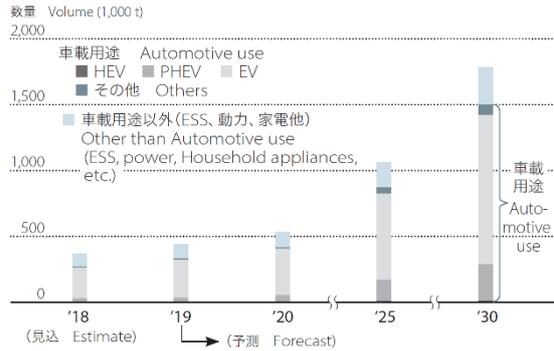
■ ニッケル高含有LiB市場規模予測
High Nickel Content Lithium-ion Secondary Battery Market Size



* ニッケル：コバルト：マンガン=5：2：3 Nickel: Cobalt: Manganese= 5: 2: 3

(出所) デロイトトーマツコンサルティング合同会社推計
(Source) Deloitte Tohmatsum Consulting LLC estimates

■ 正極材の用途別市場規模推移
Cathode Material Market Size by Use



(注) HEVはHEVトラック・バスを含む。EVはEVトラック・バスを含む。
(Note) "HEV" includes HEV trucks and buses. "EV" includes EV trucks and buses.
(出所) 富士経済「エネルギー・大型二次電池・材料の将来展望 2018 -エネルギーデバイス編-」
(Source) "Future Outlook of Energy, Large Scale Secondary Battery, and Materials 2018; Energy Devices" by Fuji Keizai

住友化学グループの正極材事業
Sumitomo Chemical Group's Cathode Material Business

■ 事業拡大への取り組み
Initiatives for Business Expansion

前駆体 Precursor	2016年10月 October 2016	田中化学研究所 子会社化 Acquired Tanaka Chemical Corp.		
	2017年11月 November 2017	増強(第一期) Expansion (I)	主原料溶解設備増強決定(田中化学) Decision to expand main raw material melting facilities (Tanaka Chemical Corp.)	2018年8月 稼働開始 Started operation in August 2018
	2018年 8月 August 2018	増強(第二期) Expansion (II)	製品生産設備・インフラ設備増強決定(田中化学) Decision to expand production and infrastructure facilities (Tanaka Chemical Corp.)	+約1,200トン/月 +approx. 1,200 t/month 2019年7月 稼働開始予定 Planned to start operation in July 2019
	2018年11月 November 2018	増強(第三期) Expansion (III)	工場建屋・製品生産設備増強決定(田中化学) Decision to expand plant buildings and production facilities (Tanaka Chemical Corp.)	+約1,200トン/月 +approx. 1,200 t/month 2020年6月 稼働開始予定 Planned to start operation in June 2020

■ 開発スケジュール
Development Schedule

次世代高容量電池向け For next-generation high-capacity batteries	2020年代前半 生産開始 Start of production in Early 2020s
全固体電池向け For all-solid-state batteries	2020年代前半 コンセプト完成 Concept completed in Early 2020s

Source: Sumitomo Chemical Co., Ltd. "Investor's Handbook 2019" P. 36

Column 6 International discussions on transition toward the realization of the objectives of the Paris Agreement

In recent years, attention has been focused on encouraging a transition toward the realization of the goals of the Paris Agreement, mainly through efforts towards low carbon emission in industries that emit greenhouse gases. Discussions are underway internationally for the establishment of finance cases, standards, and guidance for such efforts.

In particular, the International Capital Markets Association (ICMA) established a “Climate Transition Finance Working Group” in June 2019 and is discussing the concept of transition finance with a view to issuing future guidance.

[Major Discussions on Transition Finance]

Specific actions by private companies	Discussion on transition finance
<p>(1) <u>AXA “Guidelines for Transition Bond” announced (June 2019)</u></p> <ul style="list-style-type: none"> With a view to promoting a low-carbon society, this guideline aims to provide finance to issuers that currently have the goal of moving to green in the future, even if their current status is brown. 	<p>(1) <u>International Capital Markets Association (ICMA) “Climate Transition Finance Working Group” established (June 2019)</u></p> <ul style="list-style-type: none"> ICMA is discussing a concept of transition finance with a view to issuing future guidance at the WG.
<p>(2) <u>ENEL “SDG Linked Bond” issued (September 2019)</u></p> <ul style="list-style-type: none"> This is a bond with a maturity of five years: if the established KPI (raise the proportion of renewable energy from 46% to 55%) is not achieved after 2 years, the interest rate of the bond will increase by 25 basis points. 	<p>(2) <u>Climate Finance Leadership Initiative (CFLI) report “Financing the Low-carbon Future” published (September 2019)</u></p> <ul style="list-style-type: none"> This report refers to the establishment of a transition index as a leverage to expand opportunities for low-carbon investment.
<p>(3) <u>FTSE “TPI Climate Transition Index Series” established (January 2020)</u></p> <ul style="list-style-type: none"> FTSE created a transition index that evaluates the following parameters by issuer: (i) fossil fuel reserves, (ii) carbon emissions, (iii) green revenues, (iv) management quality, and (v) carbon performance. 	<p>(3) <u>“Final Report of the Expert Panel on Sustainable Finance - Mobilizing Finance for Sustainable Growth” published by Canada (June 2019)</u></p> <ul style="list-style-type: none"> In its recommendation 9, this final report states that “Canada will expand its green bond market and establish an international standard for transition-oriented finance”

Source: METI, “Study Group on Financing for Environmental Innovation Finance (1st Meeting)”

In response to these international movements, METI has established a “Study Group on Environmental Innovation Finance” to conduct discussions. In March 2020, METI formulated and internationally announced a “Concept Paper on Climate Transition Finance Principles.”

[Summary of the Concept Paper on Climate Transition Finance Principles]

<Basic Approach>

In addition to promoting financing for an already de/low-carbonized activity, for instance in the area of renewable energies, it is important to promote financing for transition actions towards the de/low-carbonization of GHG emitting industries and sectors as well, as a part of climate finance contributing to the mitigation of climate change.

In developing the concept of “financing for a transition,” two points are significant: (1) international principles should adopt an inclusive and flexible approach that can be applied to various circumstances of countries and regions without excluding specific sectors/industries or technologies from its scope, and (2) further details should be considered by each country or region based on its respective circumstances.

<Proposal for international principles on transition finance>

(Standards for alignment with the Paris Agreement)

It should be finance for a transition towards achieving the Paris Agreement goals and the reduction target of each country based on the Paris Agreement.

(Standards for business entities)

It should be finance for a business entity that is proactively pursuing a transition, including for example by providing a mid- to long-term vision or an action plan.

(Standards for projects)

It should be finance for a project in a GHG emitting industry or sector that achieves or implements the level of best performance of low GHG emissions in line with a reputable global or regional standard for such a sector or industry.

Source: TCFD Consortium, based on the “Concept Paper on Climate Transition Finance Principles” published by METI²²

In transition finance, the entity implementing the project must explain its strategy for transition, etc. The information disclosed according to the TCFD recommendations can thus be used for this purpose. Disclosure according to TCFD recommendations has been increasingly utilized, especially among those involved in the stock market. Considering the need for transition and the importance of disclosure of related initiatives, however, the TCFD recommendations is expected to be further used in corporate evaluations of bonds and loans.

²² https://www.meti.go.jp/english/press/2020/0331_004.html

Column 7 Initiatives on climate change-related innovation.....

The government of Japan issued a “Progressive Environment Innovation Strategy” in January 2020²³. The Strategy classifies innovative technologies that enable carbon neutrality into 5 areas, with a further division into 16 issues and 39 themes, and indicates an “Acceleration Plan” to realize early and society-wide implementation of the technologies. In order to promote private sector investment in the 5 innovative technology areas, the Plan encourages the disclosure of good practices by companies based on the TCFD recommendations.

In July 2020, based on the strategy mentioned above, the government of Japan also announced a “Zero Emission Challenge²⁴” which aims to support corporate actions to achieve a decarbonized society through innovation. Under this initiative, METI coordinates with Keidanren (Japan Business Federation) and New Energy and Industrial Technology Development Organization (NEDO) and lists companies that take actions with an aim to achieve a decarbonized society through innovation (List of Companies Taking on the Zero-Emission Challenge), and provides information that are useful to investors (name of company, areas of action, stage of R&D). The initial list of companies is expected to be announced around October 2020.

In June 2020, Keidanren launched the “Challenge Zero (Challenge Net Zero Carbon Innovation)” as an initiative to support efforts by companies and organizations to realize a decarbonized society²⁵. More than 130 companies and organizations expressed their support for Challenge Zero, and more than 300 examples of such challenges which seek to develop, actively implement, disseminate and finance Net-zero Emission Technology (including transition technologies) are announced.

²³ <https://www.kantei.go.jp/jp/singi/tougou-innovation/pdf/kankyousenryaku2020.pdf>

²⁴ https://www.meti.go.jp/english/press/2020/0707_004.html

²⁵ <https://www.challenge-zero.jp/>

(3) Description of recommended disclosure c)

The TCFD's recommended disclosure c) under Strategy encourages organizations to describe the resilience of their strategies under different climate-related scenarios, including a 2°C or lower scenario.

<p>Recommended Disclosure c)</p> <p>Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should describe how resilient their strategies are to climate related risks and opportunities, taking into consideration a transition to a lower-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks.</p> <p>Organizations should consider discussing:</p> <ul style="list-style-type: none"> • 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 • the climate-related scenarios and associated time horizon(s)
<p>Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017) P.21.</p>	

Descriptions of the scenario analysis are provided below in accordance with the specific procedures described in a) to c).

I. Considering strategy based on scenarios

i) Setting the scenarios

The TCFD recommends organizations to develop two or more plausible scenarios, assess the potential impacts of each scenario on their businesses, and clarify countermeasures. Many companies, however, have little experience conducting scenario analysis. Often, they have no idea of how to develop scenarios or find suitable methods to use for analysis. Many investors, meanwhile, are of the view that scenario analysis is useful even if the results cannot be quantified with a high degree of certainty²⁶. Scenario analysis and related dialogue also

²⁶ "Given the uncertainty involved to climate change, scenario analysis is considered important and is one of the key elements of the TCFD. Whilst implementation is developing, investors are supportive of companies evolving their approach." (FRC, 2019, Climate-related corporate reporting – Where to next? P.19)
Investors, however, are of the firm belief that a disclosure may still be helpful and assuring even if the results cannot be quantified with high certainty. (Id. P. 20)

provide an opportunity for companies to identify their own risks and opportunities, and to review their strategies and business models²⁷. It is therefore desirable not only for investors, but also for companies themselves, to engage in scenario analysis.

The methods of scenario analysis are broadly categorized into two types: (1) creating the organization's own scenarios and (2) using existing scenarios (e.g., those provided by industry groups or international organizations) as a reference. The TCFD recommendations state that either of the two methods is suitable.

D. Scenario Analysis and Climate-Related Issues

4. Applying Scenario Analysis

While the Task Force recognizes the complexities of scenario analysis and the potential resources needed to conduct it, organizations are encouraged to use scenario analysis to assess climate-related risks and opportunities. For organizations just beginning to use scenario analysis, a qualitative approach that progresses and deepens over time may be appropriate. Greater rigor and sophistication in the use of data and quantitative models and analysis may be warranted for organizations with more extensive experience in conducting scenario analysis. Organizations may decide to use existing external scenarios and models (e.g., those provided by third-party vendors) or develop their own, in-house modeling capabilities. The choice of approach will depend on an organization's needs, resources, and capabilities.

Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.29.

Regardless of the method an organization uses for scenario analysis, the analysis should assume two or more scenarios rather than just one, to better demonstrate corporate resilience in the face of future uncertainties.

When interpreting the results of a scenario analysis, an organization should disclose not only the conclusions, but also the consideration process leading up to the conclusions, offering both scenario narratives (or storylines) and logical explanations, in order to deepen the understanding of investors and other stakeholders.

²⁷ TCFD Consortium, 2019, Guidance on Utilizing Climate Information to Promote Green Investment (Green Investment Guidance), P.8

ii) Conducting a scenario analysis using existing scenarios

- Example in which an organization used a demand forecast for a product in an existing scenario to analyze its efforts and explain its resilience (case example 6)
- Example in which an organization used the rate of GHG emissions reduction in an existing scenario to explain its efforts (case example 7)

Case example 6 Using the demand forecast for a product in an existing scenario

Based on the IEA 2°C and Beyond 2°C scenarios, Toyota Motor Corporation has established a vision of the future society and has studied its impact on its strategy and finances. While the proportion of ZEV (vehicles that does not emit GHGs while driving) in the 2030 milestone stays below that in the Beyond 2°C scenario (even though it exceeds that in the IEA 2°C scenario), the company maintains that it can respond flexibly by changing its lineup of power trains or elevating its sales target for electric vehicles.

STEP 3 Confirm Measures Under 2030 Milestone

Milestone		
Challenge 1	Challenge 2	Challenge 3
Electrified vehicle sales: 5.5 million units ZEV sales: 1 million units	Reduce CO ₂ emissions by 25% over the entire vehicle life cycle compared to 2013	Reduce CO ₂ emission from plants by 35%

The percentages of electrified vehicles and ZEVs in global sales of new vehicles vary considerably depending on the scenario, and in anticipation of these circumstances, it will be important to flexibly consider powertrain lineups and development of mobility businesses.

Under the 2030 Milestone, the percentage of ZEVs will exceed the 2DS level, but will not reach the level necessary to achieve B2DS. However, through the development of HEVs, Toyota has been establishing a mass production base by cultivating the component technologies essential to electrified vehicles. These technologies can also be utilized in ZEVs, and Toyota is capable of making flexible and strategic changes to powertrain lineups according to demand changes. Therefore, Toyota will be able to respond to changes in social demand through advances in its electrified vehicle technologies.

Specific measures relating to electrified vehicle sales targets include the announcement that the projection for achieving the electrified vehicle sales target in the 2030 Milestone has been moved up by approximately five years. Also, Toyota invested in Uber which develops a large sharing business in North America, and is steadily proceeding correspondence to the development of new mobility business including developing automated driving ridesharing.

Source: Toyota Motor Corporation "Sustainability Data Book 2019" P. 54

Case example 7 Using the rate of GHG emissions reduction in an existing scenario

In its long-term vision for climate change mitigation, the Japan Iron and Steel Federation draws upon the rate of GHG emissions reduction required for the industrial sector (30% emission reduction by 2060) under the 2°C scenario of the IEA Energy Technology Perspectives (ETP). The federation concluded that the iron & steel sector can achieve roughly the same level of GHG emissions reduction as that envisaged by ETP through the implementation of BAT and innovative technologies, in addition to the effects of zero emissions achieved in the electric utilities sector.

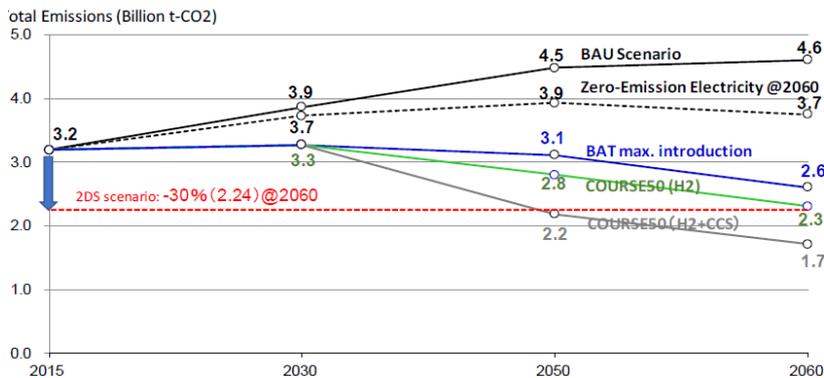
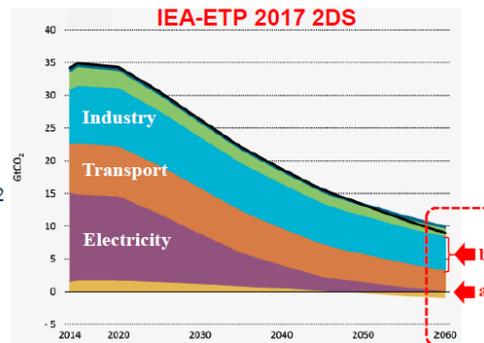
Note: The TCFD recommends the disclosure of strategy by individual companies. Therefore, it is recommended that each company discloses its strategy by building on industry-wide efforts, as shown here.

IEA-ETP 2017 2DS assumes:

- By 2060,**
- a) zero emission from the electricity sector**
 - b) 30% emission reduction from the industry sector**

Calculation Assumptions

- Emission factor from grid electricity: combined average from IGES GRID EF v10.2
- Grid electricity intensity in BF-BOF route: 140kWH/t-s (2016 average of Japan)
- Grid electricity intensity in EAF route: 872kWH/t-s (2016 average of Japan)
- CO₂ emission factor in BF-BOF route: 2.4t- CO₂/t-s
- CO₂ emission factor in EAF route: 1.0t- CO₂/t-s
- Yield of crude steel against iron source: 0.91 (both natural resource route and scrap route)



When zero emission from the electricity sector is achieved, emission from grid electricity consumed in steel production process will become zero. Topping this with the effect of maximum implementation of BAT and the effect of COURSE50 (hydrogen-reduction) from the Maximum Introduction of Innovative Technologies Scenario, the emission level in 2060 comes near the 30% reduction presented in the IEA-ETP 2017 2DS. Furthermore, when the CCS effect of COURSE50 is added, the scenario shows almost 50% reduction by 2060.

Source: Japan Iron and Steel Federation, "JISF Long-term vision for climate change mitigation –A challenge towards Zero-carbon STEEL." P.13

iii) Existing scenarios that can be referenced

As described in i), existing external scenarios can be used in a scenario analysis.

The outline and usage of these scenarios are described in detail in the “Practical guide for Scenario Analysis in line with the TCFD recommendations: 2nd edition” (See Column 8) published by the Ministry of the Environment (MOE) in March 2020. The guide provides a detailed explanation of the scenario analyses of companies and lists the following scenarios as applicable.

Table 1 Examples of Applicable Scenarios

Target	Applicable scenarios
Transition risk	<ul style="list-style-type: none"> • IEA WEO SDS / ETP 2DS / IEA WEO STEPS / IEA WEO NPS (Scenarios in which the 2°C target is achieved and is not achieved) • Deep Decarbonization Pathways Project (2°C target achieved) • IRENA REmap (Double the renewable energy ratio by 2030) • Greenpeace Advanced Energy [R] evolution (2°C target achieved)
Physical risk	<ul style="list-style-type: none"> • IPCC RCP (representative concentration pathway) scenarios: RCP 8.5, RCP 6.0, RCP 4.5, and RCP 2.6

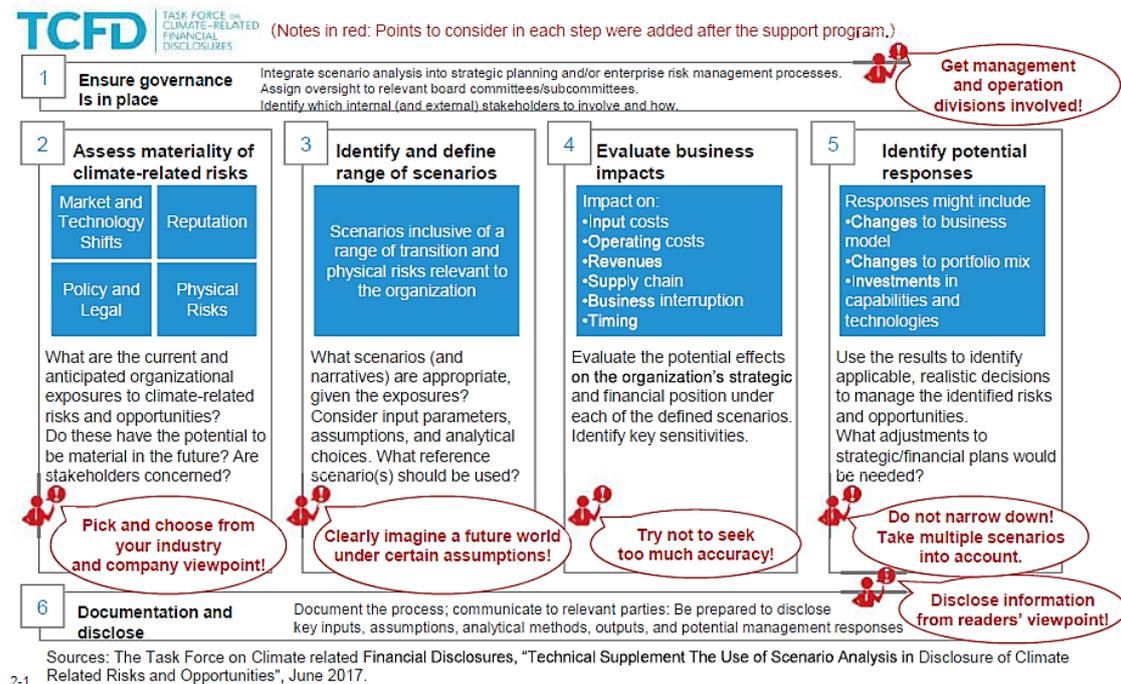
Source: MOE, Practical guide for Scenario Analysis in line with the TCFD recommendations: 2nd edition

Parameters related to transition risk and physical risk are also listed in the Appendices of the guide mentioned above.

Column 8 Practical guide for Scenario Analysis in line with the TCFD recommendations: 2nd edition

Although the TCFD recommendations encourage companies to conduct scenario analyses when disclosing their strategies, the scenario analysis process has rarely been disclosed in an easy-to-understand manner. In March 2019, MOE released the “Practical guide for Scenario Analysis in line with TCFD recommendations”, based on a support program to help companies analyze their own climate-related risks and opportunities in line with the TCFD recommendations. The program was conducted mainly in industries considered to be vulnerable to climate change, for the purpose of enabling companies to smoothly carry out scenario analyses in line with the TCFD recommendations. A revised second edition of the practical guide was published in March 2020 (hereinafter referred to as the “practical guide”). The revised practical guide (1) adds a step-by-step description of points for advancing scenario analysis, (2) provides 12 examples of companies that were chosen in the program in 2019, and (3) provides sources of external data and a collection of tools for reference.

Points to consider when implementing scenario analysis in line with the TCFD recommendations were mapped out for 18 companies, forming the basis for the trial



Source: MOE, 2020, Practical guide for Scenario Analysis in line with TCFD recommendations 2nd edition²⁸

²⁸ http://www.env.go.jp/policy/policy/tcf/TCFDguide_2nd_EN.pdf

Chapter 1 of the practical guide explains the positioning of scenario analysis in the TCFD recommendations, and Chapter 2 explains the steps of a scenario analysis in detail. The scenario development process is divided into six steps: (1) ensure that governance is in place, (2) assess the materiality of climate-related risks, (3) identify and define a range of scenarios, (4) evaluate business impacts, (5) identify potential responses, and (6) document and disclose. A series of To-Do's are illustrated for each step.

Chapter 3 provides examples of scenario analyses by a total of 18 manufacturers and non-manufacturers. As shown above, examples of analysis are provided for Steps 2 through 5: assessing the materiality of climate-related risks (Step 2), identifying and defining a range of scenarios (Step 3), evaluating business impacts (Step 4), and identifying potential responses (Step 5). These examples are helpful for the institutions engaging in scenario analysis.

In addition to the above, this guide includes appendices with information to identify transition risk and physical risk parameters from key scenario tools, as a reference for institutions conducting scenario analysis.

Transition Risk	<ul style="list-style-type: none"> • IEA World Energy Outlook (WEO) 2019 • IEA Energy Technology Perspectives (ETP) 2017 • PRI The Inevitable Policy Response (IPR) • SSP (Shared Socioeconomic Pathways) Public Database Ver 2.0
Physical Risk	<ul style="list-style-type: none"> • AQUEDUCT Water Tool (WRI) • Climate Change Knowledge Portal (World Bank) • Climate Impact Viewer (AP-PLAT) • Web GIS (A-PLAT: Japan only)

Source: MOE, 2020, A Practical guide for Scenario Analysis in line with TCFD recommendations 2nd edition

II. Quantitative Aspects for Scenario Analysis

The TCFD recommendations explain the level of quantitative disclosure in a general scenario analysis:

The Task Force believes that all organizations exposed to climate-related risks should consider (1) using scenario analysis to help inform their strategic and financial planning processes and (2) disclosing how resilient their strategies are to a range of plausible climate-related scenarios. The Task Force recognizes that, for many organizations, scenario analysis is or would be a largely qualitative exercise. However, organizations with more significant exposure to transition risk and/or physical risk should undertake more rigorous qualitative and, if relevant, quantitative scenario analysis with respect to key drivers and trends that affect their operations (...).

For an organization in the initial stages of implementing scenario analysis or with limited exposure to climate-related issues, the Task Force recommends disclosing how resilient, qualitatively or directionally, the organization's strategy and financial plans may be to a range of relevant climate change scenarios. This information helps investors, lenders, insurance underwriters, and other stakeholders understand the robustness of an organization's forward-looking strategy and financial plans across a range of possible future states.

Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), PP.27 - 28.

Feedback obtained from financial institutions views such as "We do not require an elaborate scenario analysis but use the analysis to check how organizations see risks and opportunities of climate change and manage their businesses accordingly." In disclosing a scenario analysis, an organization should therefore explain the underlying assumptions, as well as the reasons for the scenario selection.

When conducting a qualitative scenario analysis, one possible way is to describe the impacts of climate change not in absolute values but on a relative scale, applying designations such as large, medium, and small.

Case example 8 A company conducting a qualitative scenario analysis

Mitsubishi Corporation presents its recognition of the business environment and summarizes its related policies and initiatives based on a global demand forecast – a trajectory forecast for demand change expressed in seven levels, from the present until 2040 - 2050 – under several different climate scenarios, including those in the IEA’s World Energy Outlook (WEO) and Energy Technology Perspectives (ETP).

2) Results of the Analysis

The results of the scenario analyses for the eight businesses selected through the process detailed above are as follows. Scenarios are based on past data and are not forecasts. Instead, they are virtual models based on possible outcomes with high levels of uncertainty. The scenarios and business environment written here represent MC’s understanding of the main scenarios disclosed by international organizations such as the IEA (International Energy Agency), and do not represent MC’s medium to long-term outlook. Outlooks for possible outcomes in the medium to long-term take into account a number of potential risks, uncertainties and assumptions, and in actuality, may differ significantly from each scenario due to fluctuations of key factors.

How to view the charts

Name of Selected Business		Awareness of the business environment under the NPS/RTS*1 Scenario	Awareness of the business environment under the 2°C (2DS/SDS)*2 Scenario
Demand Outlook			
		<p>The trajectory forecast from the present to 2040-2050 for the global supply and demand related to the selected businesses under the NPS/RTS scenario in publications such as the IEA’s World Energy Outlook and Energy Technology Perspectives is expressed in seven levels (significant decrease, decrease, slight decrease, flat, slight increase, increase, significant increase).</p>	<p>The trajectory forecast from the present to 2040-2050 for the global supply and demand related to the selected businesses under the 2°C scenario in publications such as the IEA’s World Energy Outlook and Energy Technology Perspectives is expressed in seven levels (significant decrease, decrease, slight decrease, flat, slight increase, increase, significant increase).</p>
Awareness of the Business Environment		<p>Introduction of the general awareness of the business environment as expressed in the NPS/RTS*1, etc. (BAU scenario)</p>	<p>Introduction of the general awareness of the business environment as expressed in the 2°C Scenario (2DS/SDS), etc.</p>

Policies and Initiatives Based on the Awareness of the Business Environment	
<p>Analysis of the impact to MC’s business based on the awareness of the business environment detailed in both scenarios above, and related policies and initiatives.</p>	

*1 NPS/RTS Scenario
 One of the primary scenarios of the World Energy Outlook 2017 and Energy Technology Perspectives 2017 published by the IEA (International Energy Agency). It is a scenario based on each country’s reduction targets and climate change mitigation measures post-2020 as pledged in the Paris Agreement.

*2 2DS/SDS Scenario
 One of the primary scenarios of Energy Technology Perspectives 2017 published by the IEA (International Energy Agency), which assumes that greenhouse gas emissions will be limited to keep long-term temperature increases below 2°C. Additionally, one of the primary scenarios of the World Energy Outlook 2017 that takes into account the stable supply of energy while responding to climate change.

Source: Mitsubishi Corporation “ESG DATA BOOK 2019” P. 34

III. Describing resilience

The TCFD recommends the following disclosures describing an organization's resilience.

D. Scenario Analysis and Climate-Related Issues

4. Applying Scenario Analysis

(abbreviated)

Organizations with more significant exposure to climate-related issues should consider disclosing key aspects of their scenario analysis, such as those described below.

(abbreviated)

4. Information about the resiliency of the organization's strategy, including strategic performance implications under the various scenarios considered, potential qualitative or directional implications for the organization's value chain, capital allocation decisions, research and development focus, and potential material financial implications for the organization's operating results and/or financial position

Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.28.

Resilience disclosures describe the ability of an organization to continue its business in a set of diverse future scenarios presented in the scenario analysis.

Examples of resilience disclosures include identifying medium- and long-term risks (transition risks and physical risks) and opportunities, and the status of management and management's efforts to respond to such risks and opportunities.

E. Risk Management

The TCFD recommends the following disclosures under Risk Management.

Risk Management: Disclose how the organization identifies, assesses, and manages climate-related risks.	
<p>Recommended Disclosure a)</p> <p>Describe the organization's processes for identifying and assessing climate-related risks</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks.</p> <p>Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g. limits on emissions) as well as other relevant factors considered.</p> <p>Organizations should also consider the following:</p> <ul style="list-style-type: none"> • processes for assessing the potential size and scope of identified climate-related risks • definitions of risk terminology used or references to existing risk classification frameworks used
<p>Recommended Disclosure b)</p> <p>Describe the organization's processes for managing climate-related risks</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations.</p>
<p>Recommended Disclosure c)</p> <p>Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.</p>

Source: "Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), PP. 21-22.

A “Risk Management” disclosure in the TCFD recommendations is interpreted as a disclosure of processes for identifying, assessing and managing climate-related risks. The financial impact of risks identified as a result of “Risk Management” is classified into the items disclosed in “Strategy,” and the organizational structure of the supervision/implementation of risk management in the management of the entire organization is classified into the items disclosed in “Governance.”

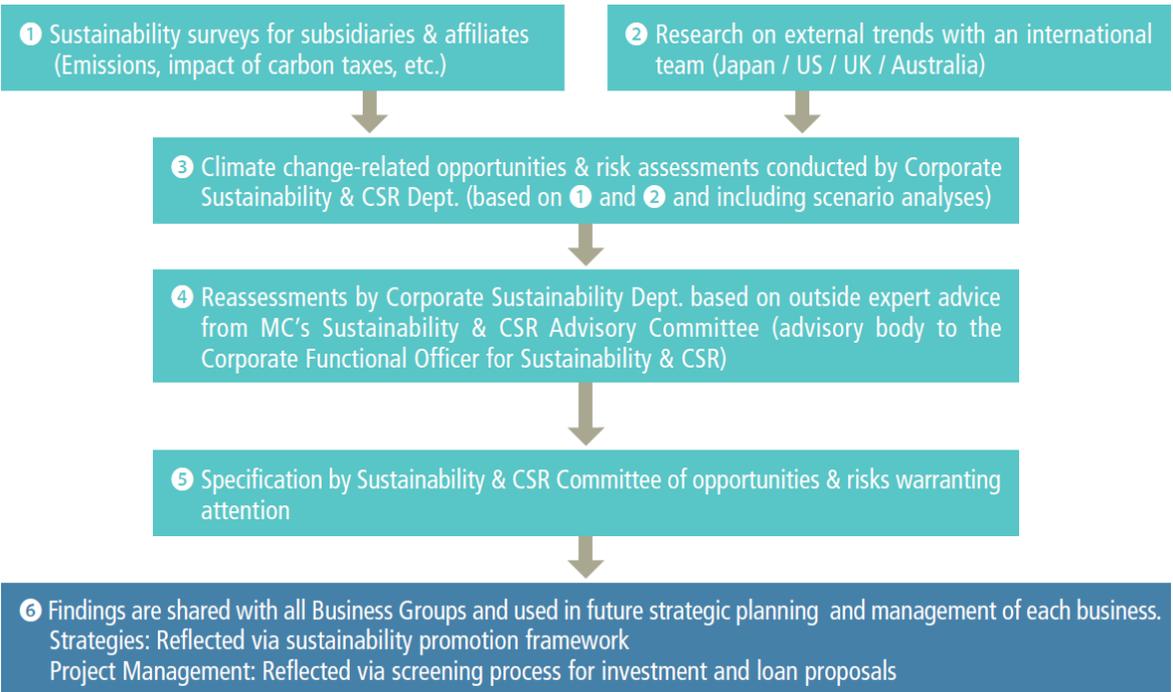
As for the methods used to identify and prioritize the relative materiality of climate-related risks, companies can conduct materiality assessments using a materiality matrix²⁹ (see Case example 9).

Another effective approach is to concretely present the organization’s management processes for climate-related risks using figures and written narratives (see Case example 10).

²⁹ A method of comparing the relative materiality of climate-related risks based on a two-axis graph plotting out various sustainability issues, with one axis plotting the importance of the issues to stakeholders and the other plotting the significance of the issues to the organization.

Case example 9 Describing climate-related risk management processes and systems

Mitsubishi Corporation uses flow charts to describe its processes and management systems for assessing and identifying climate-related risks. The company also states that the results of its considerations on climate-related risk management are used to formulate strategies and screen the investment and loan proposals of individual businesses.

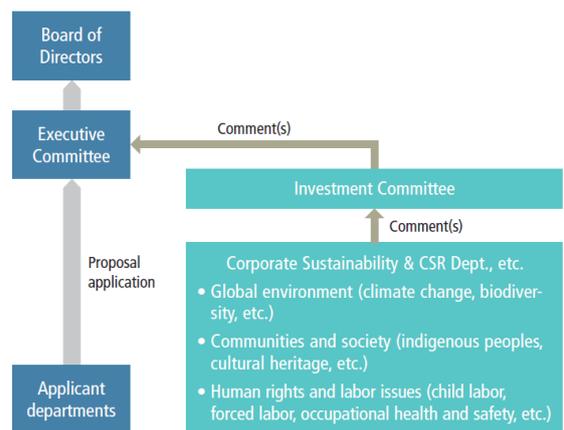


When reviewing and making decisions on loan and investment proposals, MC has adopted a process in which the Investment Committee deliberates all proposals to be discussed by the Board of Directors and the Executive Committee comprehensively based not only on economic aspects, but on ESG factors as well.

By having the General Manager of the Corporate Sustainability & CSR Department take part in Investment Committee meetings as a committee member, MC has put in place a screening process to facilitate decision-making that takes into account environmental and social impacts. Besides screening new and exit proposals, the Investment Committee also strives to help make improvements to existing business investees by monitoring their management practices.

From the perspective of climate change-related transition opportunities and risks, review of proposals and decision-making takes into consideration quantitative data such as greenhouse gas emissions as well as national policies and industry trends.

Screening Process for Loan and Investment Proposals

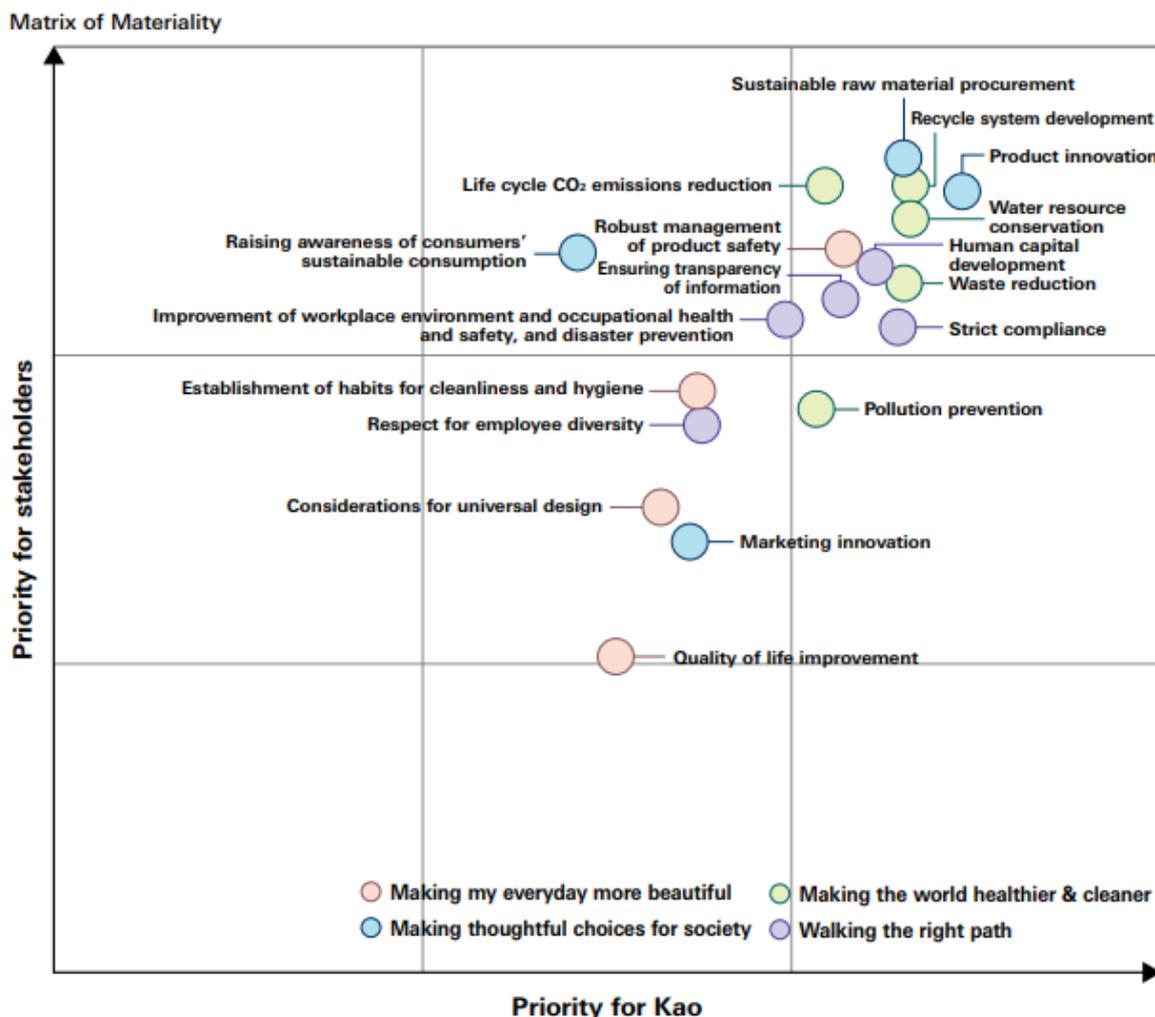


Reference: For information on measures to address various ESG-related risks, please see the risk management information provided in each section.

Source: Mitsubishi Corporation “ESG DATA BOOK 2019” P. 43

Case example 10 Use of a materiality matrix

Kao Corporation discloses a materiality matrix, mapping the priority for the stakeholders and the priority for the company.



Source: Kao Corporation "Sustainability Data Book 2020" P.13

F. Metrics and Targets

The TCFD recommends the following disclosures under Metrics and Targets.

Metrics and Targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities, where such information is material.	
<p>Recommended Disclosure a)</p> <p>Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable.</p> <p>Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies</p> <p>Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a lower-carbon economy.</p> <p>Metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.</p>
<p>Recommended Disclosure b)</p> <p>Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should provide their Scope 1 and Scope 2 GHG emissions and, if appropriate, Scope 3 GHG emissions and the related risks.</p> <p>GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions. As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.</p> <p>GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics</p>

<p>Recommended Disclosure c)</p> <p>Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.</p>	<p><u>Guidance for All Sectors</u></p> <p>Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a lower-carbon economy. In describing their targets, organizations should consider including the following:</p> <ul style="list-style-type: none"> • whether the target is absolute or intensity based • time frames over which the target applies • base year from which progress is measured, and • key performance indicators used to assess progress against targets. <p>Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures</p>
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Source: “Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017) , PP.22-23

For disclosures of Metrics and Targets, the TCFD recommends organizations not to limit disclosures to items recommended for disclosure, but to use narratives to help investors and other stakeholders understand how such metrics and targets are linked to the organization’s value creation, and how such metrics are aligned to the organization’s strategy.

A company making a disclosure can deliver information more effectively to investors and other stakeholders by clarifying the preconditions used in establishing the metrics and setting the targets. The disclosure of any changes to a method for calculating indicators is also recommended³⁰.

It should also be noted that while the TCFD recommends organizations to disclose Scope 1, Scope 2, and if appropriate Scope 3 GHG emissions, the boundaries defined by each company with respect to assessment when calculating Scope 3 GHG emissions are not identical. Hence, a simple comparison between companies is not possible³¹.

³⁰ “An approach is to ... explain changes in calculations, changes from the previous year and scope and boundary” (FRC, 2019, Climate-related corporate reporting – Where to next? P.23)

³¹ “Corporate Value Chain (Scope3) Accounting and Reporting Standard” includes the following information.

1.5 Scope of the standard

(...)

“Use of this standard is intended to enable comparisons of a company’s GHG emissions over time. It is not designed to support comparisons between companies based on their scope 3 emissions. Differences in reported emissions may be a

One of the metrics included in the TCFD recommendations as an illustrative example is “avoided GHG emissions through the entire product life cycle.” Disclosing GHG emission reductions in the use phase of products and services, not GHG emissions as a single company, allows a company to demonstrate the degree to which it contributes to GHG emission reductions globally through its products and services. Several guidance documents have been developed on the assessment and disclosure of reduction contributions across the value chain (See Column 9). The Green Investment Guidance, meanwhile, cites examples of the viewpoints of investors and other stakeholders. One investor, for example, requires companies not only to provide GHG emissions during production but also to explain how the products contribute to GHG emission reductions downstream, while another investor considers that information on GHG emission reductions in society as a whole is useful for duly evaluating a company that is making an effort to reduce GHG emission., even if the company’s business expansion would increase emissions.

Column 9 Method for assessing and disclosing GHG emission reduction contributions through the global value chain.....

1) Guidelines for Quantifying GHG emission reductions of goods or services through the Global Value Chain ³² (METI)

These guidelines are designed to present a framework and fundamental principles for organizations for the quantification of the GHG emission reductions in each phase of the life cycles of products and services (i.e., from the raw materials procurement phase to the manufacturing phase, use phase, and disposal phase).

The guidelines provide descriptions of the definitions of avoided emissions, steps for quantifying them, and methods for reporting the calculation results, etc.

2) “Contributing to Avoided Emissions through the Global Value Chain - A new approach to climate change measures by private sectors (GVC Concept Book)”³³ (Keidanren)

The book presents the concept and significance of contributing to GHG emission reductions through the Global Value Chain (GVC), with case examples of “visualizing” such contributions by various industries and companies.

result of differences in inventory methodology of differences in company size or structure. Additional measures are necessary to enable valid comparisons across companies. Such measures include consistency in methodology and data used to calculate the inventory, and reporting additional information such as intensity ratios or performance metrics.”

(Source) GREENHOUSE GAS PROTOCOL “Corporate Value Chain (Scope 3) Accounting and Reporting Standard”

³² <https://www.meti.go.jp/press/2017/03/20180330002/20180330002-1.pdf>

³³ <https://www.keidanren.or.jp/policy/vape/gvc2018.pdf>

G. Disclosure Methods for Companies with Diverse Business Models

A company with diverse business models has multiple business domains with different characteristics. In such a company, the materiality of climate change and business strategies differ from business to business. The point at issue, when implementing company-wide disclosure, is therefore to determine the business subjected to the strategy disclosure, as well as the extent of description.

One approach is to start by identifying climate-related risks and opportunities for individual business models, and then to examine the potential impacts on the company as a whole based on the current or future revenues and the magnitude of the materiality of climate change. When companies disclose such information, however, investors and other stakeholders will require them to disclose the risks and opportunities of individual business models³⁴. If deemed material, therefore, such a disclosure should ideally be considered.

In addition, if companies expect the future expansion of a business in an area that is currently small, they should ideally arrange the disclosure according to their expected future business portfolios by focusing their explanation on that business.

Case example 11 Disclosure of multiple business areas

In its integrated report, the Hitachi Group identifies businesses with a relatively high likelihood of being affected by climate change from its own business portfolio, and provides an overview of business risks and opportunities based on climate-related scenarios and their responses. The details, meanwhile, are provided in the Group's sustainability report. The disclosure in the sustainability report considers factors other than the environment, in addition to temperature scenarios (2 °C, 4°C), for each business, with the impact for each business, including financial information, fully described.

Strategies for 2°C/4°C Scenarios Based on TCFD Recommendations (abridged)

Target businesses	Railway systems	Automotive systems	Water systems	Power generation and power grids	IT systems
Responses to future business risks and opportunities	Continue to strengthen the railway business, as global demand for railways will increase under either scenario	Enhance response to new markets, such as for electric vehicles, under the 2°C scenario, and also to existing technologies like internal combustion engines under the 4°C scenario	Strengthen provision of seawater desalination facilities and other water generation systems in response to increased water demand from global economic growth, urbanization, and population growth under either scenario	Continue to enhance responses to relevant markets in view of expected higher demand for non-fossil energy under either scenario	Continue to develop innovative digital technologies and enhance digital service solutions that generate new value in view of expected market expansion under either scenario

Source: Hitachi Group "Hitachi Integrated Report 2019" P. 77

³⁴ "Investors acknowledged that disclosure is evolving, and that they want to understand the effects on the specific business model and strategy, including on an asset-by-asset basis." (FRC, 2019, Climate-related corporate reporting – Where to next?) P.23)

Strategies for the 2°C and 4°C Scenarios					
Target businesses	Railway systems	Automotive systems	Water systems	Power generation and power grids	IT systems
The business environment under the 2°C scenario	<ul style="list-style-type: none"> • Demand for railways, which run on electricity and emit less CO₂, will grow as regulations for CO₂ emissions are strengthened globally • Shift to energy-saving railcars will further accelerate, including on existing routes 	<ul style="list-style-type: none"> • Electric vehicles will rapidly spread as tighter laws and regulations on fossil fuels push up fuel prices and discourage ownership of internal combustion engine vehicles. Markets for alternative, non-fossil technologies like hydrogen and fuel cells will expand • The number of countries and regions with near zero sales of internal combustion engine vehicles will increase 	<ul style="list-style-type: none"> • Need for efficient water treatment systems that emit less CO₂ will expand as tighter regulations on CO₂ emissions in each country and region lead to stringent energy regulations on pumps used in water treatment 	<ul style="list-style-type: none"> • Power generation facilities for CO₂-free renewable energy, nuclear power, and other non-fossil sources, as well as high-efficiency power generation facilities that contribute to CO₂ reduction will expand with tighter CO₂ emission regulations in each country and region • Demand will expand for construction of power networks enabling the mass introduction of renewable energy with large output fluctuations • Innovations in energy-saving technologies will further expand demand for energy-saving equipment and services 	<ul style="list-style-type: none"> • Climate change will lead to tighter CO₂ emission regulations in each country and region and changes in the market environment, prompting shifts in customers' business portfolios and IT investments • The development of and demand for energy-saving, high-efficiency IT and data analysis technologies will further expand • Demand will increase for high-efficiency IT systems utilizing CO₂-free non-fossil energy investments and loans for low-carbon businesses, green bond issues, and other financial businesses will expand
The business environment under the 4°C scenario	<ul style="list-style-type: none"> • Transport-related energy regulations will remain weak, discouraging a shift to railways, and conventional modes of transportation like automobiles and motorcycles will persist in some areas • The risk of flood damage to railways and related facilities will increase due to a rise in such natural disasters as typhoons and floods 	<ul style="list-style-type: none"> • Fuel efficiency laws and regulations will remain lax globally, and internal combustion engine vehicles will remain a major mode of transport; the modal shift will be slow, as conventional automobiles and motorcycles will remain predominant • The risk of damage to vehicles will increase due to a rise in such natural disasters as typhoons and floods in various areas 	<ul style="list-style-type: none"> • Demand for clean water will increase due to an increase in abnormal weather phenomena like floods, intense heat, and drought • Rising temperatures will cause a rise in the volume of required cooling water, the growth of bacteria and algae, and a deterioration in water quality due to floods • The risk of damage to water-related equipment from such natural disasters as typhoons and floods will increase 	<ul style="list-style-type: none"> • The cost competitiveness of non-fossil energy will increase and demand for renewable, nuclear, and other non-fossil energy will increase as the expansion of energy consumption pushes up the price of fossil fuels • The risk of damage to power plants and networks will increase due to such natural disasters as typhoons and floods 	<ul style="list-style-type: none"> • Demand for new, high-efficiency technology will expand as damage to information equipment from such natural disasters as typhoons and floods increases and as energy demand for multiplex IT systems in response to BCP increases • Investment in social and public systems to reduce damage from more frequent natural disasters will increase
Non-environmental factors (neither the 2°C nor 4°C scenario) and market conditions	<ul style="list-style-type: none"> • Economic growth, urbanization, and population growth will drive the railway business globally as an efficient form of public transport for large numbers of passengers, regardless of whether CO₂ regulations are tight; market size in Japan will remain flat, but other markets in Asia and elsewhere will expand • Major railway manufacturers will expand their business to meet global demand 	<ul style="list-style-type: none"> • Economic growth, urbanization, population growth, and infrastructure development like road construction will expand the global market for automobiles as a flexible and personal means of transport • Carmakers will have varying degrees of enthusiasm in promoting electrification • Non-environmental factors like safety, security, and comfort will drive competitiveness, as demand increases for new functions like autonomous driving and advanced safety features, and new mobility services like car sharing grow 	<ul style="list-style-type: none"> • Economic growth, urbanization, and population growth will push up demand for water in some areas • In Japan, local governments and other entities will accelerate wide-area collaboration and privatization in building water systems and improving the efficiency of their management • Replacement demand for aging water treatment facilities will increase in developed countries 	<ul style="list-style-type: none"> • Economic growth, urbanization, and population growth will push up demand for energy, especially electricity, mainly in developing countries • Energy source will be chosen from the perspective of not just CO₂ emissions but also environmental burden, economic performance, safety, and supply stability • Stability and efficiency of the power supply will increase through the use of digital technology • Both companies and individuals will seek to diversify their energy supply and demand 	<ul style="list-style-type: none"> • Further digitization will exponentially increase the volume of data circulated, accumulated, and analyzed • New services and businesses utilizing big data, IoT, AI, and other digital technology will expand rapidly
Responses to future business risks and opportunities	<ul style="list-style-type: none"> • Response to 2°C or 4°C scenario • Continue to strengthen the railway business, as global demand for railways will increase under either scenario • Promote R&D of new products and services that improve efficiency of railway services through digital utilization, such as dynamic headway (flexible operation in response to passenger demand), thereby offering customers increased value 	<ul style="list-style-type: none"> • Response to 2°C scenario • Promote R&D of electrification technology and other alternative technologies to enhance response to new markets, such as for electric vehicles • Response to 4°C scenario • Promote R&D and product development in existing technologies, including internal combustion engines, to not only improve energy efficiency but increase such non-environmental value as safety, security, and comfort 	<ul style="list-style-type: none"> • Response to 2°C or 4°C scenario • Strengthen provision of seawater desalination facilities and other water generation systems in response to increased water demand from global economic growth, urbanization, and population growth under either scenario 	<ul style="list-style-type: none"> • Response to 2°C or 4°C scenario • Continue to enhance response to relevant markets in view of expected higher demand for non-fossil energy under either scenario • Strengthen the grid solution business in response to increased use of renewable energy with large output fluctuations and diversification of energy suppliers • Promote digital service solutions business for diversifying needs of power customers 	<ul style="list-style-type: none"> • Response to 2°C or 4°C scenario • Continue to develop innovative digital technologies and enhance digital service solutions that generate new value in view of expected growth in society's demand and markets for digital services under either scenario
Financial information (sales volume of each target sector)	Impact on part of 616.5 billion yen in Railway Systems Business Unit sales (FY 2018)	Impact on part of 971 billion yen in automotive system business sales (FY 2018)	Impact on part of 160.1 billion yen in Water & Environment Business Unit sales (FY 2018)	Impact on part of 456.6 billion yen in Energy Sector sales (FY 2018)	Impact on part of 2,121.6 billion yen in IT Sector sales (FY 2018)

We believe that by paying close attention to market trends and developing our business flexibly and strategically, we have high climate resilience in the medium to long term under either the 2°C or 4°C scenario

Note: The above scenario analyses are not future projections but attempts to examine our resilience. How the future unfolds may be quite different from any of these scenarios.

Source: Hitachi Group "Hitachi Sustainability Report 2019" P. 53

H. Steps for Implementing the TCFD Recommendations at Mid-cap and Small- and Medium-sized Companies

The TCFD recommendations suggest that all companies, regardless of size, implement disclosure related to Governance and Risk Management in their financial filings. For disclosures related to the Strategy as well as Metrics and Targets, the Task Force recommends that non-financial companies with more than one billion U.S. dollar equivalent (USDE) in annual revenue consider disclosing such information in reports other than financial filings when the information is not deemed material.

Implementing disclosure in accordance with the TCFD recommendations, however, is a large burden for mid-cap and small- and medium-sized companies. Requiring them to implement disclosure on all recommended disclosure items immediately would be unreasonable. The preferable option, therefore, is to have small- and medium-sized companies begin by disclosing information that is manageable, and then to expand the coverage of disclosure in stages. In Japan, for example, the Japan Chamber of Commerce and Industry is promoting a “Global Warming Action Declaration” in which small- and medium-sized enterprises declare and announce their own global warming countermeasures. These efforts are expected to be further developed to gradually advance companies’ responses to the TCFD recommendations (See Column 10).

There are cases in which large corporate customers seek to reduce GHG emissions throughout their supply chains by requiring mid-cap and small- and medium-sized companies to disclose their GHG emissions. By disclosing their own efforts towards reducing GHG emissions, mid-cap and small- and medium-sized companies can draw attention from large companies that seek to reduce GHG emissions throughout their supply chains, and thereby increase their business opportunities.

Column 10 Initiatives by the Japan Chamber of Commerce and Industry for “Global Warming Action Declaration”

The Japan Chamber of Commerce and Industry (JCCI) invites companies to submit declarations on their efforts to address 18 issues related to global warming countermeasures and announces their declarations on its website. The following is a list of the issues.

<p>1. Working toward energy conservation: reducing CO₂ emissions</p> <p>(1) Measure the amount of energy used by the company (All companies or business sites).</p> <p>(2) Create a long-term action plan for energy conservation.</p> <p>(3) Reduce energy consumption by reviewing and updating the operation of equipment and facilities.</p> <p>(4) Review work styles and business practices, and strive to conserve energy.</p> <p>(5) Call on customers, business partners and other stakeholders to conserve energy.</p> <p>(6) Promote the use of renewable energy.</p> <p>(7) Practice environmentally friendly driving.</p>	<p>2. Working to improve knowledge and motivation for global warming countermeasures</p> <p>(8) Encourage employees to take energy conservation measures and thoroughly implement the 3Rs (Reduce, Reuse, Recycle) in the workplace.</p> <p>(9) Encourage employees and their families to take energy-saving measures at home and to promote the 3Rs.</p> <p>(10) Work to improve the environmental knowledge of our employees.</p> <p>(11) Participate in local environmental activities.</p> <p>(12) Carry out Cool Biz and Warm Biz activities.</p> <p>(13) Actively implement green purchasing.</p> <p>(14) Thoroughly separate waste.</p> <p>(15) Promote simple packaging.</p>	<p>3. Continuing to address global warming</p> <p>(16) Declare our own global warming countermeasures, evaluate the results, and make continuous improvements.</p> <p>4. Publish of results of in-house activities</p> <p>(17) Publish the rate of CO₂ emission reductions</p> <p>(18) Publish the rate of reduction in energy consumption</p>
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Source: “What is the Global Warming Action Declaration, JCCI Navigation of Energy and Environment”³⁵

³⁵ <https://eco.jcci.or.jp/aboutdeclaration> (in Japanese)

A. Objectives of Sector-Specific Disclosure Guidance

Chapter 2 explained topics common to all industrial sectors in the four thematic areas in which the Task Force recommends disclosure: Governance, Strategy, Risk Management, and Metrics and Targets. In the case of disclosure on Strategy or Metrics and Targets, however, different sectors have different climate-related risks and opportunities, which may lead to variance in the methods for presenting strategies and in the metrics and targets used to measure them.

The TCFD recommendations include sector-specific supplemental guidance³⁶. This provides recommendations for disclosure to the financial sector (Banks, Insurance Companies, Asset Owners, and Asset Managers) and non-financial groups (Energy, Transportation, Materials and Buildings, and Agriculture, Food and Forest Products Groups), for groups of sectors or for individual sector. For those belong to the financial sector, specific guidance are provided on Strategy, Risk Management and Metrics and Targets. For the non-financial groups, guidance common to the non-financial group is provided for Strategy, whereas sector-specific guidance on Metrics and Targets is provided.

With reference to “Key Issues considered and Areas for Further Work,” the TCFD recommendations also state that “the Task Force encourages further research and analysis by sector and industry experts to increase organizations’ understanding of climate-related risks and opportunities.” This leaves the guidance for the sector-specific disclosure as a remaining issue.

Investors and other stakeholders want information on the ability of companies to respond to the changes in the business environment caused by climate change. Companies should therefore specify how they respond to those changes, and how their business activities contribute to climate change mitigation. In particular, a company must clarify how its specific contributions help to resolve issues both domestically and globally, and demonstrate its own sustainability in changing business environments.

Therefore, this chapter focuses on effective disclosure in each industrial sector for the purpose of demonstrating a company’s contribution to climate change issues. When implementing disclosure in accordance with the recommended disclosures proposed in this chapter, companies should clarify the financial impacts of their efforts to reduce GHG emissions – e.g., reduced energy costs, increased revenues from the sale of goods and services that help to mitigate climate-related issues – according to the TCFD recommendations calling for the disclosure of the financial impacts of climate-related risks and opportunities.

The recommended disclosures explained below are not presented as “tick-boxes.” Each

³⁶ <https://www.fsb-tcf.org/publications/final-implementing-tcf-recommendations/>

disclosure item presented in this Guidance is an example of a recommended disclosure for a company if climate change is deemed to have material impacts on its business model. In addition, such disclosures by companies can be expected to facilitate dialogue with investors and other stakeholders, and to thereby deepen their understanding of industry-wide efforts and contributions to climate change issues.

The following is a list of recommended disclosure items that have been established in consideration of the characteristics of each industry.

The recommended disclosures

Eight items were envisaged for three phases of activities (manufacturing phase, use phase, other) in the four sectors (automobiles, steel, chemicals, and electrical and electronics). Figure 10 shows the alignment between the value chain of corporate activities and the items recommended for disclosure. The items considered to be important in each sector are explained.

Each item in parentheses indicates the sector for which a specific guidance is provided.

- (1) Efforts to reduce GHG emissions in the manufacturing phase
 - a) Efforts to reduce GHG emissions in the manufacturing process
 - b) Efforts to reduce GHG emissions in procurement
 - c) Efforts to develop and disseminate pioneering technologies to reduce GHG emissions in the manufacturing phase
 - d) Efforts to reduce GHG emissions through recycling and resource circulation
- (2) Efforts to reduce GHG emissions in the use phase
 - a) Efforts to reduce GHG emissions from the use of products
 - b) Efforts to contribute to GHG emissions reduction through the value chain³⁷
 - c) Efforts to develop and disseminate pioneering technologies to reduce GHG emissions in the use phase
- (3) Other efforts
 - a) Efforts to contribute to GHG emissions reduction through the provision of technologies

³⁷ A contribution to GHG emissions reduction through the value chain is an emissions reduction effect obtained by replacing products or services with other products or services in their use phase.

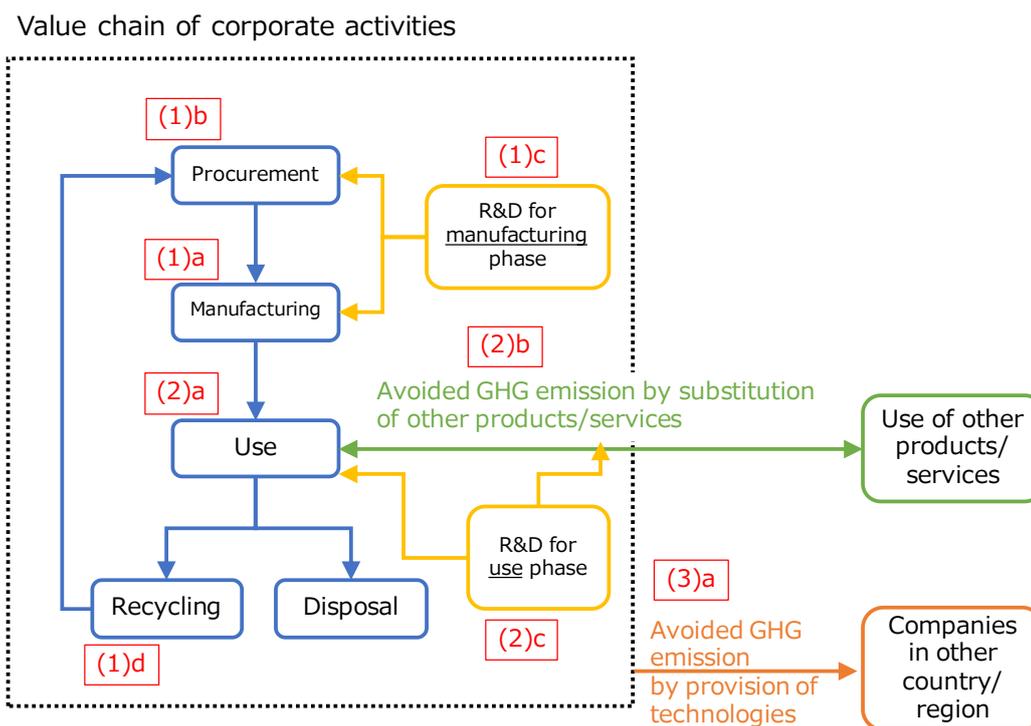


Figure 10 The relationship between the recommended disclosure item and the covered sectors

The structure of the value chain in the energy sector differs from that of other manufacturing industries. Therefore, it becomes important in this sector to address the entire value chain from the procurement of resources to the supply and use of energy. In the food, banking, life insurance, non-life insurance sectors, and international shipping, the value chain structure of corporate activities and the assumed risks and opportunities differ from one sector to another. The recommended disclosure Items have therefore been developed according to the characteristics of the respective sectors.

Note that disclosure based on the TCFD recommendations is still evolving worldwide. The disclosed contents are expected to be improved as case examples accumulate. Under these circumstances, this Guidance has been developed as a first step to respond to the TCFD recommendations. Revisions to the content are assumed to be forthcoming, and sectors are expected to be added based on reviews of the contents and sectors as the disclosure practice makes progress in the future.

B. Sector-Specific Recommended Disclosures

(1) Automobiles

The TCFD recommendations describe climate-related risks and opportunities for the Transportation group, including the automobile industry, as shown below. This section provides supplemental guidance focusing on the automobile industry.

Description of the Transportation group in the TCFD recommendations

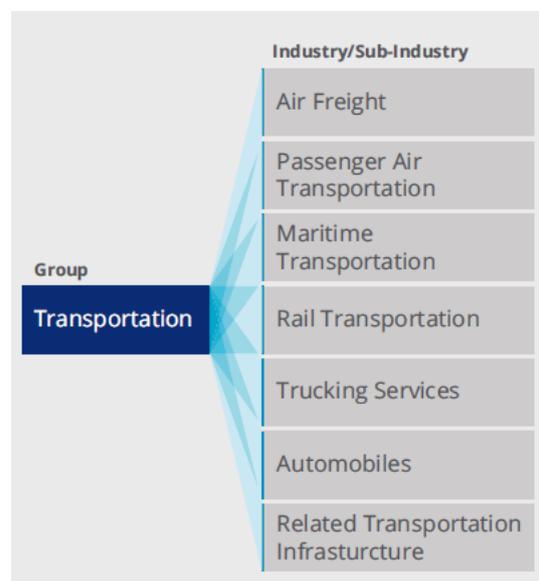
2. Transportation Group

Transportation is critical to the economy and drives a significant portion of emissions and demand for energy through the production and, more important, the use phase. The industry is under increasing policy and regulatory pressure to achieve emission targets for the use phase. Increasing constraints on emissions fuel efficiency will continue to impact costs in this group, particularly around investments in innovation (new technologies and efficiencies)³⁸.

The Transportation Group, therefore, will likely face financial challenges from two major drivers. First, policymakers are setting stricter targets for emissions and fuel efficiency from transportation carriers. Second, new technology around low-emission/fuel-efficient carriers (e.g., electric cars) is creating a shift in the competitive and investment landscape. New technological innovations and new market entrants can weaken companies' market position, resulting in lower revenues, higher costs, and narrower margins. The effects of these two drivers may be compounded by the length of product cycles for transportation products, such as cars and trucks, and especially for air and rail and marine equipment. As with the Energy Group, investments in long-lived assets (e.g., manufacturing facilities, airplanes, ships) and longer planning horizons are relevant factors that must be taken into account when considering the climate-related risks and opportunities.

Consequently, disclosures should focus on qualitative and quantitative assessments and potential impacts of the following:

Figure11 Transportation



³⁸ Moody's Global Credit Research, "Moody's: Auto sector faces rising credit risks due to carbon transition." September 20, 2016.

financial risks around current plant and equipment, such as potential early write-offs of equipment and R&D investments or early phasing out of current products due to policy constraints or shifts or the emergence of new technology;

investments in research and development of new technologies and potential shifts in demand for various types of transportation carriers; and

opportunities to use new technologies to address lower-emissions standards and increased fuel-efficiency requirements, including transport vehicles (cars, ships, planes, rail) that run on a range of traditional and alternative fuels.

Source: “Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), P.56

The number of vehicles sold in the automobile industry is expected to continue growing, particularly in emerging countries. On the other hand, vehicles with improved environmental performance are required around the world more than ever with tightening regulations on fuel consumption. The industry has also faced a wave of technological innovation called CASE³⁹ in recent years, which requires innovations to significantly change the existing business models.

One of the new possibilities expected of automobiles is an active contribution to global efforts to combat climate change.

From a climate change perspective, the use phase of vehicles emits the largest amount of GHG in the automobile lifecycle. Contributions to climate change measures can thus be well demonstrated by describing efforts to develop next-generation vehicles (HV, EV, FCV, etc.) or to reduce emissions through “Well-to-Wheel” as an emissions reduction strategy.

I. Efforts to reduce GHG emissions in the manufacturing phase

Efforts to reduce GHG emissions in the manufacturing process

Automobiles with high environmental performance like EVs may actually emit more GHG in the vehicle manufacturing phase than conventional vehicles. An important point, therefore, is to reduce GHG emissions in the manufacturing phase as well as the use phase.

(Disclosure example)

- Targets and results of GHG emissions per vehicle manufactured

Another important point is to assess environmental impacts through the entire automobile lifecycle from the design stage of vehicles, and to reflect the results in the design planning. Doing so will lead to GHG emission reductions through the entire lifecycle encompassing the

³⁹ Connectivity, Autonomous, Shared and Electric

manufacturing phase as well as use and disposal phases.

Efforts to reduce GHG emissions in procurement

Efforts to reduce the GHG emissions from suppliers are important for the overall reduction of GHG emissions in the procurement phase, as the automobile industry consists of a large number of suppliers.

(Disclosure examples)

- Establishment of Green Procurement Guidelines
- Introduction of mechanisms to manage supplier GHG emissions

II. Efforts to reduce GHG emissions at the usage stage

Efforts to reduce GHG emissions from the use of products

Given the policy trend of national governments (fuel consumption regulations, etc.) and the increasing consumer awareness of environmental issues, efforts to reduce emissions from the use phase, the phase that accounts for the major part of GHG emissions in the automobile lifecycle, are a crucial point to present in disclosures on GHG emissions in the automobile industry.

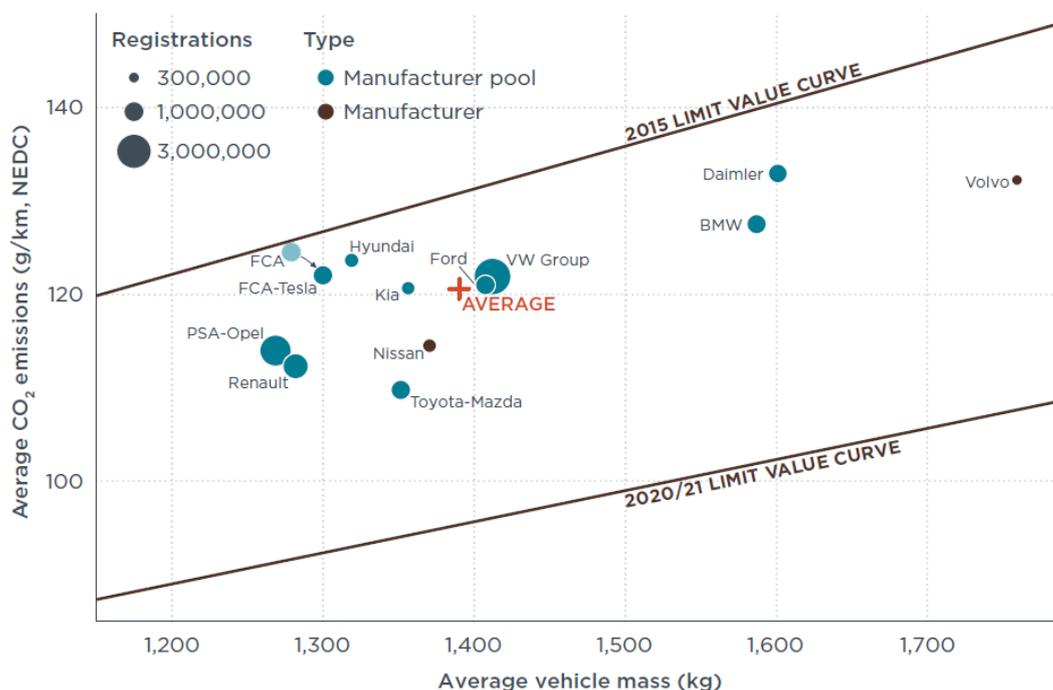
(Disclosure example)

- Medium- and long-term targets and results related to GHG emissions (or fuel consumption) from an average new vehicle

An effective way to show a company's technological level compared with the world or industry average is to refer to benchmark values. A comparison with benchmark values for each major market is also important to include, as consumer needs differ from market to market.

Reference example: A comparison of the average fuel consumption of companies in Europe

The International Council on Clean energy Transportation (ICCT) calculates the average fuel consumption of passenger vehicles sold in a given year by automaker using data compiled by the European Environment Agency. The average fuel consumption depends not only on the fuel economy performance of each vehicle model, but also the sales mix of vehicles. The average fuel consumption of vehicles produced by each automaker is compared by the average vehicle weight class.



Source: ICCT (International Council on Clean Transportation), "CO₂ emissions from new passenger cars in the EU: Car manufacturers' performance in 2018"

Efforts to contribute to GHG emissions reduction through the value chain

Another important point to present is the amount of avoided GHG emissions by those vehicle models, as the introduction of energy-efficient vehicles is expected to contribute to reduced GHG emissions by replacing conventional vehicles. Efforts are also underway to contribute to reduced GHG emissions by efficient energy management through the use of EVs.

(Disclosure example)

- Amount of avoided GHG emissions through the improvement of vehicle energy efficiency, etc.

Efforts to develop and disseminate emerging technologies that reduce GHG emissions in the use phase

Another effective approach to presenting a company's strategy to reduce GHG emissions in the use phase is to present the efforts taken to develop and disseminate emerging technologies, particularly those related to vehicle models that contribute to reduced GHG emissions among the company's products. Given the variety of the vehicle models that contribute to reduced GHG emissions, such as hybrid vehicles, electric vehicles (EV), and fuel cell vehicles (FCV), a company needs to present its competition strategy in addition to the types of vehicle models it is to develop to contribute to reduced GHG emissions.

(Disclosure examples)

- Definition of vehicle models that contribute to reduced GHG emissions
- Specific technological development efforts and future goals (the number of vehicles sold or the market share)

Zero-emission vehicles (ZEVs) such as EVs and FCVs emit GHGs not from the use phase, but during the phases of extraction, manufacturing, and supply of fuel. An effective way to present the contribution of a ZEV to GHG emission reduction in its lifecycle is to compare the GHG emissions from a "Well-to-Wheel" perspective.

(2) Iron and Steel

The TCFD recommendations describe climate-related risks and opportunities for the Materials and Buildings group, including the iron & steel industry, as shown below. This section provides supplemental guidance focusing on the iron & steel industry.

Description of the Materials and Buildings group in the TCFD recommendations

3. Materials and Buildings Group

The Materials and Buildings Group includes, but is not limited to, industries listed in Figure 12.

Materials and Buildings Group organizations are typically capital intensive, require high investments in plants, equipment, and buildings that are (relatively) fixed in terms of location, and dependent on sources of raw and refined materials. This may reduce the flexibility of organizations in this group to adapt to risks of climate change.

Many of this group's activities result in financial exposures around high GHG emissions and high energy consumption. Furthermore, a number of industries in this group are dependent on water availability and/or vulnerable to the effects of acute or chronic physical risks from weather events.

Since the group is capital intensive and the plants and facilities have a long life span, accelerated R&DDD (research, development, demonstration, and deployment) is critically important. Thus, disclosures relating to R&DDD plans and progress are valuable to see the current and future situation and risks of organizations in the group.

Consequently, disclosures should focus on qualitative and quantitative assessments and potential impacts of the following:

- Stricter constraints on emissions and/or pricing carbon emissions and related impact on costs.
- The construction materials and real estate sectors should assess risks related to the increasing frequency and severity of acute weather events or increasing water scarcity that impact their operating environment.
- Opportunities for products (or services) that improve efficiency, reduce energy use, and support closed-loop product solutions.

Source: "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.59

Figure 12 Materials and Buildings



The largest amount of GHG emissions from the iron & steel industry occurs in the manufacturing phase. A company in this industry can therefore demonstrate its contributions to solving climate change by indicating the efforts taken to reduce GHG emissions through efficiency improvements in the manufacturing phase. Steel manufacturing technologies can be categorized into blast furnaces and electric furnaces. Since raw materials for electric furnaces are scrap steel manufactured by the blast furnace process and used as products, the World Steel Association (worldsteel) developed and defined ISO 20915, the idea of GHG emissions that regards the blast furnace method and the electric furnace method as a single steel material recycling system.

For blast furnaces, hydrogen reduction iron manufacturing and other innovative technologies are being developed as fundamental technologies to reduce GHG emissions. It is also important to disclose climate change measures through such efforts.

I. Efforts to reduce GHG emissions in the manufacturing phase

Efforts to reduce GHG emissions in manufacturing processes

In the iron & steel lifecycle, the manufacturing process emits the largest amount of GHG. As the demand for iron & steel is expected to endure worldwide, companies in the iron & steel industry can adopt the strategy of improving the efficiency of the iron & steel manufacturing process. Given that improved operation techniques and improvements from capital investment at a company are reflected in intensity (GHG emissions per unit of output), information is preferably disclosed on an intensity basis.

In understanding the numerical value quantified on an intensity basis, each company should take into account the setting of boundaries, the ratio of blast furnaces to electric furnaces, etc.

(Disclosure example)

- Efforts to improve efficiency in the manufacturing process (energy intensity)

Furthermore, in order to show the company's technological level compared with the world or industry average, it is effective to refer benchmark values.

Efforts to develop and disseminate emerging technologies that reduce GHG emissions in the manufacturing phase

An important approach, in presenting a strategy related to future climate change measures, is to present efforts to develop emerging technologies.

(Disclosure example)

- Progress in or prospects for efforts to dramatically reduce GHG emissions in the manufacturing phase (e.g., development of hydrogen-reduction iron manufacturing technologies)

Reference: COURSE50 technology

A project designed to develop technologies to reduce CO₂ emissions by approx. 30% by reducing the emissions through the adoption of hydrogen reduction processes in blast furnaces and the separation and collection of CO₂ using a separation system. The project aims to establish technologies by around 2030 and to practically utilize and diffuse them by 2050.

Efforts for resource circulation through recycling

The iron & steel industry has been promoting efforts focused on resource circulation through the recycling of used products and byproducts generated from the manufacturing phase, as well as through the utilization of waste plastics, in order to indirectly contribute to reduced GHG emissions. Demonstrating the contributions of those recycling efforts to reduced GHG emissions is important.

(Disclosure examples)

- Material flow of manufacturing processes
- Recycling rate of byproducts generated from the manufacturing process
- Efforts to substitute coke through the use of waste plastic as a fuel and chemical feedstock

II. Efforts to reduce GHG emissions in the use phase

Efforts to contribute to GHG emissions reduction through the value chain

In addition to presenting the GHG emission reductions in the manufacturing phase, it is also important to present a strategy for the development and dissemination of products that contribute to the realization of final products with lighter weights, longer lives, and improved energy efficiency.

(Disclosure examples)

- Introduction of products that contribute to reduced GHG emissions
- Avoided emissions by each product

III. Other efforts

Efforts to contribute to GHG emissions reduction through the provision of technologies

Based on the recognition that the transfer of energy-efficiency technologies overseas is effective in reducing GHG emissions at a global level, the iron & steel industry has been actively disseminating advanced energy-efficiency technologies to developing countries in various ways. It is therefore important to disclose such efforts.

(Disclosure example)

- Amount of a contribution to reduced GHG emissions through the provision of technologies

(3) Chemicals

The TCFD recommendations describe risks and opportunities for the Materials and Buildings Group, including the chemical sector, as shown below. This section provides supplemental guidance focusing on the chemical sector.

Description of the Materials and Buildings Group in the TCFD recommendations (reprint)

3. Materials and Buildings Group

The Materials and Buildings Group includes, but is not limited to, industries listed in Figure 12.

Materials and Buildings Group organizations are typically capital intensive, require high investments in plants, equipment, and buildings that are (relatively) fixed in terms of location, and dependent on sources of raw and refined materials. This may reduce the flexibility of organizations in this group to adapt to risks of climate change.

Many of this group's activities result in financial exposures around high GHG emissions and high energy consumption. Furthermore, a number of industries in this group are dependent on water availability and/or vulnerable to the effects of acute or chronic physical risks from weather events.

Since the group is capital intensive and the plants and facilities have a long life span, accelerated R&DDD (research, development, demonstration, and deployment) is critically important. Thus, disclosures relating to R&DDD plans and progress are valuable to see the current and future situation and risks of organizations in the group.

Consequently, disclosures should focus on qualitative and quantitative assessments and potential impacts of the following:

- Stricter constraints on emissions and/or pricing carbon emissions and related impact on costs.
- The construction materials and real estate sectors should assess risks related to the increasing frequency and severity of acute weather events or increasing water scarcity that impact their operating environment.
- Opportunities for products (or services) that improve efficiency, reduce energy use, and support closed-loop product solutions.

Source: "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.59

**Figure 12 Materials and Buildings
Materials and Building Group**



Companies in the chemical sector conduct a wide range of business activities, and the industry has a very complex structure overall. Manufacturing processes in the chemical industry can be divided into the following categories: basic chemicals such as ethylene and propylene produced using naphtha, etc. as raw materials; intermediate chemicals, including plastics, produced using basic chemicals as raw materials; and final chemical products, such as molded plastics, produced from intermediate chemicals. The processes of manufacturing basic chemicals generate a large amount of GHG emissions in cracking naphtha, etc., and generally emit more GHG emissions than the processes of manufacturing intermediate chemicals and final chemical products.

Given that the chemical industry emits a large amount of GHG in the manufacturing phase, as described above, efforts to reduce GHG emissions in the manufacturing processes in the industry are important. Chemical products are made mainly from fossil resources at present. Over the medium- to long-term, the industry has prospects for achieving reduced GHG emissions by working on the diversification of raw materials using biomass, etc. as raw materials.

Many chemical products are intermediate materials that can contribute to reduced GHG emissions through the use phase of final products in sectors such as automobiles and home electronics. A wide range of products in the chemical industry are produced and used for diverse applications in the use phase, contributing to reduced GHG emissions. An important step in disclosure, therefore, is to describe business opportunities by identifying those products and demonstrating their applications, the mechanisms of GHG emissions reduction (the mechanisms by which they lead to reduced emissions), and the amounts of avoided GHG emission.

I. Efforts to reduce GHG emissions at the manufacturing stage

Efforts to reduce GHG emissions from manufacturing processes

The chemical industry emits a large amount of GHG in the manufacturing phase. Companies can thus adopt the GHG emission reduction strategy of improving the efficiency of manufacturing processes and shifting to high value-added products with low GHG emissions. The sheer variety of products handled in the chemical industry makes it difficult to assess such efforts using a single type of metric. One possible metric related to energy intensity is energy consumption per total production, revenues, and profit. Another is the use of total GHG emissions.

These metrics, however, are affected by changes in the product mix and production volume. Any disclosure, therefore, should describe the reasons for such changes.

(Disclosure examples)

- Efforts to improve energy intensity and reduce total GHG emissions (e.g., efforts to save energy through the conversion of the production system, use of waste heat in a cascaded manner, fuel switch in captive power generation)

Efforts to reduce GHG emissions in procurement

Some types of chemical products may emit more GHG emissions in the procurement phase than in the manufacturing phase. In such a case, a company should disclose its efforts to reduce GHG emissions in procurement.

(Disclosure examples)

- Targets for reduced energy intensity in logistics
- Efforts for supply chain management (establishment of a green procurement policy, etc.)

Efforts to develop and disseminate emerging technologies that reduce GHG emissions in the manufacturing phase

On a medium- to long-term basis, it is important to develop new manufacturing methods using innovative technologies that will replace conventional manufacturing methods. When a company is working on the development of advanced technologies to reduce GHG emissions in a chemical product life cycle, it should describe such efforts and the GHG emissions reduction potential in its disclosure.

(Disclosure examples)

- Efforts to develop emerging technologies (e.g., development of a membrane separation process, conversion of CO₂ to raw materials (CCU⁴⁰), use of biomass as a raw material, use of natural gas, use of methane hydrate as a resource)
- Expected effect of technology development in GHG reduction

II. Efforts to reduce GHG emissions in the use phase

Efforts to contribute to GHG emissions reduction through the value chain

The chemical industry manufactures a wide variety of chemical products, many of which are intermediate materials. In planning out its strategy, therefore, a company can choose to supply products that contribute to the resolution of climate change issues in the use phase.

⁴⁰ Carbon Capture and Utilization

(Disclosure examples)

- Definition of environmentally beneficial products and their contribution to sales
- Amount of avoided GHG emissions through environmentally beneficial products

Efforts to develop and disseminate emerging technologies that reduce GHG emissions in the use phase

A key step, for a company developing environmentally beneficial products (e.g., high thermal insulation materials and high-strength lightweight materials), is to provide a detailed description of its research and development. Explanations on how environmentally beneficial products reduce GHG emissions (i.e., how they bring about reduced emissions) are also useful, as they help investors better understand the products and their benefits overall.

(Disclosure examples)

- Efforts and the amount of investment in research and development of environmentally beneficial products
- Mechanism for reducing GHG emissions through environmentally beneficial products

(4) Electrical and electronics

Companies in the electrical and electronics industry can be roughly categorized into device companies and assembly companies. Device companies are those that primarily manufacture semiconductors and other electronic components that are built into electronic devices but not used on their own. Therefore, it is important for device companies to reduce GHG emissions in the manufacturing phase. Assembly companies, meanwhile, manufacture final products from various parts. As many of their products emit a large amount of GHG from energy consumption in the use phase as opposed to the manufacturing phase, it is important for them to demonstrate their contributions to climate change reduction by reducing emissions in product use. Some types of products consume relatively little energy in the use phase (e.g., cameras, audio devices). For these products, the reduction in GHG emissions is more important in the manufacturing phase.

Given the wider range of products produced in the electrical and electronics industry, both device and assembly companies should ideally identify the products or technologies that contribute to reduced GHG emissions in the use phase, describe their usage, and explain how they contribute to reduced emissions.

I. Efforts to reduce GHG emissions at the manufacturing stage

Efforts to reduce GHG emissions in manufacturing processes

If a device company, or an assembly company which primarily manufactures products with lower energy consumption in the use phase, its products emit no GHG emissions in the use phase (or emit a smaller amount of GHG emissions than in the manufacturing phase). This type of company should therefore describe its efforts to reduce emissions in the manufacturing phase.

(Disclosure example)

- Efforts to improve manufacturing process efficiency (energy intensity)

II. Efforts to reduce GHG emissions in the use phase

Efforts to reduce GHG emissions from the use of products

In the case of assembly companies that primarily manufacture products with larger energy consumption in the use phase, it is important to disclose specific efforts for reducing GHG emissions in the use phase.

In view of the ongoing improvements in electrical and electronics products year after year, it is also important to demonstrate the superior performance offered by such products, along with the progress in energy efficiency.

(Disclosure example)

- Efforts to improve the energy efficiencies of primary products
(e.g., improvement of energy efficiencies during the use of products)

Efforts to contribute to GHG emissions reduction through the value chain

The electrical and electronics industry produces a wide range of products, many of which can contribute to reduction in GHG emissions. An important step in disclosure, therefore, is to identify products or technologies that contribute to reduced GHG emissions, and disclose their contribution to reduction. In the particular case of renewable energy facilities or other products which do not emit GHG, it is important to disclose the avoided GHG emissions.

Furthermore, that if a company gives definitions for its environmentally beneficial products, it is important to describe those definitions and to disclose the sales of the products so defined (in total or per product).

(Disclosure examples)

- Introduction of products and services that contribute to reduced GHG emissions
- Amount of avoided GHG emissions through products and services

Efforts to develop and disseminate emerging technologies that reduce GHG emissions in the use phase

Another important step is to describe efforts for technological development to reduce GHG emissions in the product use phase. Specific efforts may include technological development of energy management using IoT solutions, in addition to technological development related to the energy efficiency of each product.

(Disclosure examples)

- Technological development to improve the energy efficiency of products
- Technological development of IoT solutions leading to reduced GHG emissions (energy management, etc.)

(5) Energy

The TCFD recommendations describe risks and opportunities for the Energy Group, as shown below. This section provides supplemental guidance focused on the Energy Group.

Description of the Energy Group in the TCFD recommendations

1. Energy Group

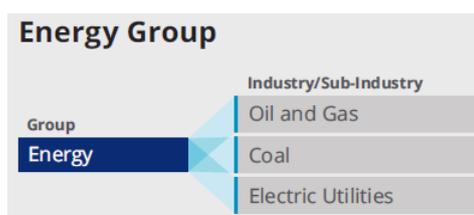
Energy is a critical element in the economy, serving as a primary or necessary input in most economic activities. This group comprises organizations extracting, processing, producing, and distributing fossil fuels or electric energy to other sectors of the economy. It includes, but is not limited to, industries listed in Figure 10.

While many climate-related issues impact the Energy Group, organizations in this group should consider providing disclosures related to financial implications of potential physical impacts (e.g., reliance on water in areas of high water stress, severe storm/flood mitigations) and transition impacts (e.g., policy requirements, carbon prices, new technology, changes in market demand) of climate-related risks and opportunities.

As fossil fuel and electricity providers, the organizations in this group generally have significant financial exposure around transition issues related to GHG emissions and, in many cases, are dependent on the availability of water. For example, a majority of the current electricity supply comes from non-renewable fossil fuel resources, resulting in a significant exposure to transitions around global GHG emissions—either directly through utility companies' own energy use for production or indirectly through combustion of fossil fuels⁴¹. Electric utilities, therefore, face significant transition risk (i.e., the financial risk arising from the changes in asset valuations caused by the structural shift toward a low-carbon energy system). This is because the utility sector's asset valuations are at risk from the disruptive impact of the policy, technology, and portfolio changes that will occur over the next two to three decades as policies, technology, and markets shift to a low-carbon energy system.

In addition to GHG emissions, both hydroelectric power generation and cooling for nuclear and nonnuclear power generation use large quantities of water⁴². Physical risks affecting water supplies creates a potentially important exposure for this industry.

Figure 10 Energy Group



⁴¹ According to data compiled by the IEA, CO₂ emissions from fuel combustion in the energy sector and its activities amounted to 32.2 Gt in 2015, or 60% of the total human-induced GHG emissions in that year. CO₂ emissions from the electric utilities sector were 13.6Gt, accounting for 42% of the total energy-induced CO₂ emissions and 25% of the total human-induced GHG emissions. The transport sector follows the industry sector as the next most important emissions source. CO₂ emissions by the transport sector amounted to 7.4Gt in 2015 (23% of the total energy-induced CO₂ emissions and 14% of the total human-induced GHG emissions). IEA, CO₂ Emissions from Fuel Combustion: Highlights. 2015

⁴² Michelle T.H., van Vliet, et al. "Power-generation system vulnerability and adaptation to changes in climate and water resources." *Nature Climate Change* 6 (2016): 375-380.

Oil, gas, and coal extraction face similar transition risks as key suppliers to electric utilities. These industries also rely on water to a significant degree^{43,44,45}.

These characteristics make the Energy Group particularly sensitive to physical, policy, or technological changes affecting fossil fuel demand, energy production and usage, emission constraints, and water availability. The regulatory and competitive landscape that surrounds electric utilities also differs significantly between jurisdictions, thus making assessment of climate-related risks very challenging.

As a result, both the transition risks and physical risks associated with climate change may impact the operating costs and asset valuation of organizations engaged in energy activities. In particular, organizations within the Energy Group are generally capital intensive, require major financial investments in fixed assets and supply chain management, and have longer business strategy/capital allocation planning horizons relative to many other sectors—horizons that may be particularly affected by climate-related risks and opportunities. This requires careful assessment of climate-related risks and opportunities to inform decisions about future sustainability and profitability.

Transparent and decision-useful climate-related disclosures are crucial to fully understand the impact of climate change on business strategy and financial plans in energy activities. Consequently, disclosures should focus on qualitative and quantitative assessments and potential impacts of the following:

Source: “Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), PP.52-53

Premises: National energy policy

Energy companies play a role in the stable supply of energy for a country. The energy industry is exposed to geopolitical risks associated with the procurement of resources, and the business activities of each company are integrated with national energy policy. The disclosure of an energy company, therefore, should ideally describe its strategy based on the relevant national energy policy.

[Principle of energy policy in Japan]

Energy is an infrastructure that supports every human activity. A precondition for the further development of Japan is the creation of an energy supply and demand structure that can achieve a stable energy supply with a lower social burden. Based on this principle, the Cabinet approved the fifth strategic energy plan under the Basic Act on Energy Policy in July 2018. The plan presents the basic direction of Japan’s energy policy

⁴³ IPIECA, *Water Resource Management in the Petroleum Industry*. 2005.

⁴⁴ International Council on Mining and Metals (ICCM), *In Brief: Water stewardship framework*. London: International Council on Mining and Metals, 2014.

⁴⁵ World Resources Institute (WRI), *Water-Energy Nexus: Business Risks and Rewards*, Washington, DC: 2016.

as making maximum efforts to achieve a low-cost energy supply through the improvement of economic efficiency on the premise of safety and with energy security as the nation's top priority, while at the same time promoting environmental sustainability (3E plus S).

Japan is dependent on imports from overseas for most of its energy sources. As a consequence, the country has difficulty securing resources by itself when a problem with the energy supply arises overseas. This is a fundamental vulnerability that cannot be eliminated simply by curbing energy consumption. Japan has thus made efforts to diversify risks by developing alternative energy sources and securing domestic energy sources.

As a country prone to natural disasters such as large-scale earthquakes (e.g., the Great East Japan Earthquake) and frequent typhoons, Japan must establish a robust supply and demand structure that ensures a stable energy supply even at a time of crisis.

Each energy source has its own strengths and weaknesses in the supply chain. No single source can support a stable and efficient energy supply and demand structure. As such, Japan needs to diversify its energy sources rather than concentrating intensively on any one source. Japan's energy policy must be suited to the environment surrounding the country. Establishing a stable energy supply and demand structure based on the basic principle of achieving 3E plus S is essential.

The recommended disclosures

Medium- and long-term target setting and efforts to reduce GHG emissions

Energy companies in sectors such as electric power, gas, and petroleum refinery are working to set medium- and long-term targets appropriate for their businesses in addressing climate change issues. Their aim, in doing so, is to establish a supply structure that can achieve a stable, low-cost, environmentally friendly energy supply in a well-balanced manner with security as a top priority.

Electric utility companies are actively contributing to environmental measures, such as reduction of CO₂ emission intensity based on the 3E plus S principle, as well as working on disclosure of information such as composition of power sources. It is important for them to continue to disclose their efforts for reducing GHG emissions on the demand side through the promotion of introduction of renewable energy, etc.

(Disclosure examples)

- Efforts to increase the proportion of non-fossil energy sources
- Efforts to reduce CO₂ emissions through the efficiency improvement of thermal power generation

Oil companies are making efforts, such as advanced and effective utilization of oil and introduction of sustainable renewable energy. It is important for them to disclose their efforts related to the life cycle that includes the product consumption phase, such as measures for reducing CO₂ emissions in their manufacturing processes.

(Disclosure examples)

- Emissions and efforts in each process of, or through, the entire supply chain, such as energy conservation related to their manufacturing processes (oil refineries)
- Efforts to introduce biomass fuels by considering sustainability

Gas companies are contributing to environmental measures by promoting the diffusion of natural gas, a fuel with superior environmental performance. It is important for them to disclose their efforts to reduce CO₂ emissions through the value chain, from the manufacturing to the use and consumption of city gas.

(Disclosure examples)

- Efforts to reduce CO₂ emissions intensity and energy intensity in the process of manufacturing city gas, etc.
- Efforts to contribute to energy conservation and reduce GHG emissions by promoting the diffusion and use of cogeneration systems, fuel cells, etc.

Efforts in research and development

In many countries, GHG emissions are chiefly related to energy use. It becomes vital, under such circumstances, to promote efforts to reduce GHG emissions related to energy use, both on the energy demand side and energy supply side.

An electric utility company, on the energy supply side, must therefore disclose its research and development efforts in the energy manufacturing phase, along with its efforts in various other phases such as its transmission systems and consumers.

(Disclosure example)

- Principles and efforts related to the development of technologies that contribute to lower carbon emissions, such as thermal power technology for reducing environmental impacts, addressing the introduction of a large quantity of renewable energy, and development of technologies for efficient energy utilization.

For oil and gas companies, the disclosure should focus on efforts related to research and development on the following items.

(Disclosure examples)

- Principle and efforts related to research and development on efficiency improvements in production facilities and the development of products with superior fuel-saving performance, as well as the efficiency-improvement effects achieved through such technologies [oil companies]
- Principle and efforts related to the development of technologies for further efficiency improvements and low carbonization related to gas usage, such as combustion technology and cogeneration [gas companies]
- Research and development efforts focused on technologies such as hydrogen and methanation technology for significant CO₂ reduction [gas companies]

Efforts to encourage actions to save energy and GHG emissions by customers

In addition to making supply-side efforts, a country seeking to rationalize its energy supply and demand structure needs to create an environment where customers have diverse options that allow them to work towards curbed GHG emissions based on rational decisions. It thus becomes important for energy companies to disclose information on services designed to encourage customers to take actions to save energy and GHG emissions at their own initiative.

(Disclosure examples)

- Efforts to reduce GHG emissions on the demand side by promoting the diffusion of high-efficiency electrical equipment, etc. [electric utility companies]
- Efforts related to products and services that contribute to energy-saving in the use phase of oil [oil companies]
- Efforts related to smart energy networks and energy management systems [gas companies]

Efforts for resource circulation and recycling

From the perspective of reducing environmental impacts, it is important to disclose efforts for resource recycling, waste reduction, and water consumption reduction, etc.

Efforts to contribute to reduced GHG emissions through overseas business

Energy companies are actively engaged in overseas business by leveraging technologies and know-how cultivated through domestic businesses. Therefore, it is important for them to disclose their efforts to contribute to reducing GHG emissions overseas through their overseas energy supply business and consulting business on energy conservation, etc.

(6) Food

The TCFD recommendations describe risks and opportunities for the Agriculture, Food, and Forest Products Group, including the food sector, as shown below. This section provides supplemental guidance focusing on the food sector.

Description of the Agriculture, Food, and Forest Products Group in the TCFD recommendations

4. Agriculture, Food and Forest Products Group

The Agriculture, Food and Forestry Products Group includes, but is not limited to, the industries listed in Figure 13

Climate-related risks and opportunities in this group largely emanate from GHG emissions and water and waste management driven by land use, production practices, and changing land-use patterns⁴⁶.

The absolute and relative impacts of climate-related transition and physical risks will vary between producers and processors of food and fiber.

Producers, such as agriculture and forestry enterprises, will likely be impacted financially to a somewhat greater degree by GHG and water risks (including extreme weather events and shifts in precipitation patterns) than processors. Agriculture and forest producers generate significant non-point GHG emissions, primarily through land-use practices and changes to them (e.g., grazing, soil tillage practices, conservation practices, feedlot practices, deforestation, or afforestation)⁴⁷.

Processors, such as food, beverage, and fiber processors (e.g., paper), will likely be impacted relatively less by direct GHG emissions (Scope 1), but more by indirect GHG emissions (Scope 3) arising from their supply and distribution chains. Processors will also have a similar emphasis on water and waste risks and opportunities as compared with producers. Beverage production and paper production, for example, depend on access to significant water resources and, in the case of beverage production, high-quality water

Figure 13 Agriculture, Food and Forest Products Group



⁴⁶ According to the IPCC, agriculture and forestry, "GHG emissions from agriculture, primarily deforestation and livestock, soil and nutrient (manure) management, account for less than 1/4 of anthropogenic GHG emissions. Human-induced deforestation and biomass burning (forest fires and slash-and-burn fields) are also important sources of emissions." (IPCC "Agriculture, Forestry and Other Land Use (AFOLU)," In: Climate Change 2014: Mitigation of Climate Change, 2014. The Contribution of Working Group III to the Fifth Assessment Report of the IPCC). Agriculture also makes extensive use of water resources, mainly through irrigation.

⁴⁷ For more information, see the definition of "Land use change and indirect land use change" in IPCC's Climate Change 2014: Mitigation of Climate Change page 1,265.

resources. Risks and opportunities around waste include residual materials such as paper and wood waste, wastewater, and post-processing animal by-products.

Assessing the impacts of climate-related risks and opportunities for the Agriculture, Food, and Forest Products Group involves a number of interactions and trade-offs among the climate-related aspects of land use, water, waste, carbon sequestration, biodiversity, and conservation, complicated by short-run competing goals around food security (e.g., maintaining production sufficient to meet the rising demand for food, fiber, fodder, and biofuels).

Policies and regulations around land use and conservation requirements, for example, may constrain or preclude certain uses of land and water resources (e.g., deforestation, riparian rights, tillable land). Such policies may lead to significant asset impairment if forest or agricultural lands cannot be used to produce food or fiber.

Opportunities in the Agriculture, Food, and Forest Products Group largely fall into three categories:

- Increasing efficiency by lowering the level of carbon and water intensity per unit of output (e.g., through drought-resistant hybrids, nutrient-efficient genetically modified organisms (GMOs), feed and feed practices that reduce livestock methane emissions).
- Reducing inputs and residual waste for a given level of output (e.g., nutrient management practices, tillage practices, conservation practices, biofuels, food waste reduction).
- Developing new products and services with lower carbon and water intensity (e.g., bioplastics).

Disclosures, therefore, should focus on qualitative and quantitative information related to both the group's policy and market risks in the areas of GHG emissions and water, and its opportunities around carbon sequestration, increasing food and fiber production, and reducing waste, including:

- Efforts to reduce GHG emissions and water intensity, including such non-point GHG sources as crop nutrient processes, livestock management processes, erosion, tillage practices, watershed practices, and forest management.
- Efforts to improve sustainability through better recycling of outputs and residual waste (e.g., wood products, food waste, and animal byproducts).
- Climate-related impacts on food and fiber production (e.g., extreme weather or water events).
- Opportunities that capture shifts in business and consumer trends toward food and fiber products, processes and services that produce lower emissions and are less water-/waste intensive while maintaining adequate food security (e.g., bioplastics, GMOs, new uses for wood/animal byproducts), and forestry/livestock by-products).

Source: “Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), PP.62-63

It should be noted that the food sector offers a wide range of products, and the risks and opportunities for changing demand and procuring raw materials due to climate change are not uniform across products.

Physical risks are the primary subject of disclosure for agricultural, livestock, and fishery products used as raw materials for food. Climate change has various potential impacts on raw material procurement through changes in plant and animal growth associated with rising temperatures, reduced or increased production, changes in the quality of raw materials due to pest and disease outbreaks, increased procurement costs associated with investment in adaptation, and shifts in production areas.

Attention should also be paid to instability in the supply of water necessary for food production linked to weather disasters such as droughts or floods, worsened water quality due to changes in precipitation patterns, decreased glacier melt water, the excessive use of fossil water, or regulatory trends such as restrictions of water intake. In addition, weather disasters linked to climate change, such as heavy rains, floods, or droughts, may also increase the risk of interruptions in the supply of goods due to disruptions in plant operations or distribution.

While efforts are being made to reduce GHG emissions at the manufacturing of food products, the GHG generated in raw material production, or emissions throughout the supply chain (including packaging, transportation, and delivery) should also be considered. Several other sources of GHG emissions should also be noted, such as the conversion of forests to farmland and grassland, and emissions from production of agro-livestock products such as the rumination of livestock and composting.

In addition, efforts to reduce energy consumption, water conservation and food loss are important because they not only reduce GHG emissions but also reduce energy costs.

GHG emission reduction through reductions in food loss and the use of byproducts as feed and fertilizer is an issue unique to the food industry. A food producer can effectively demonstrate its contribution to climate change by describing efforts to address these issues.

The business opportunities created by climate change in the food industry include the development of products to meet increased demand stemming from changes in consumer preferences linked to extreme temperatures, and increased purchasing activities that take environmental impact into account.

Efforts to stabilize raw material procurement

In the food sector, it is important to identify and assess risks such as increased procurement costs due to the impact of climate change on raw material production, or insufficient procurement, an issue that may entail problems with quality. The identification and

assessment of these risks forms the basis of disclosure on measures to stabilize raw material procurement.

(Disclosure examples)

- Assessment of the impact of procurement risks (reduction of raw material yields and quality, increase in procurement costs, etc.) on business operations, and the status of countermeasures considered
- Efforts to reduce risks through the diversification and change of procurement areas
- Procurement of raw materials with third party certification in sustainable production and distribution, such as RSPO⁴⁸, the Rainforest Alliance⁴⁹, FSC⁵⁰ or raw materials that have undergone in-house assessment in accordance with equivalent standards
- Initiatives to support producers in sustainable agriculture and livestock industries (Examples: dissemination of sustainable production methods, support for producers' management, etc.)

Addressing Water Risks

Ideally, a company should describe an impact assessment on business operations and the measures to be taken to address water-related risks.

As water is essential for both raw materials and cleaning in food production, a company should appropriately assess and address the risks pertaining to water supply and wastewater associated with climate change.

Physical risks include meteorological disasters (typhoons, heavy rains, floods, droughts, etc.) on production and distribution⁵¹. Mitigation measures should therefore be considered.

⁴⁸ Roundtable on Sustainable Palm Oil: A non-profit organization that develops and operates certification schemes for sustainable palm oil (website: <https://rspo.org/>). In the case of palm oil, the rapid expansion of oil palm plantations and inappropriate plantation management lead to massive emissions due to the deforestation of tropical rainforests or greenhouse gas emissions from waste oil in extraction facilities. Procurement of RSPO-certified raw materials can reduce or avoid these climate change risks.

⁴⁹ Rainforest Alliance: A non-profit organization that certifies farms that are working to solve climate problems in the terrestrial environment by improving land management methods such as more sustainable agriculture, as well as conserving and restoring forests (website: <https://www.rainforest-alliance.org>).

⁵⁰ Forest Stewardship Council: An independent non-profit organization that aims to promote responsible forest management throughout the world and operates an international forest certification system (website: <https://fsc.org/en>).

⁵¹ For example of the impacts of floods on businesses, finances, and finance pathways, see below:

WBCSD Food, Agriculture and Forest Products TCFD Preparer Forum, "Disclosure in a time of system transformation: Climate-related financial disclosure for food, agriculture and forest products companies", April 2020, P 47 (Figure 20) (<https://docs.wbcsd.org/2020/04/WBCSD-TCFD-Food-Agriculture-and-Forest-Products%C2%AC-Preparer-Fourm-report.pdf>)

(Disclosure examples)

- Assessment of the impact of water risk on business operations and the status of countermeasures considered
- Support for dissemination of sustainable agriculture and livestock farming (Examples: water-saving agriculture, etc.)
- Water resource conservation activities (Examples: forest conservation, the flooding of paddy fields, etc.)
- Efforts to reduce water withdrawal and consumption (Examples: reduction of water use per unit of production, recycling of water, etc.)
- Utilization of methane gas generated in wastewater treatment for power generation
- Evaluation of the impact of meteorological disasters (storm and flood damage risks) on projects and consideration of countermeasures (Examples: disaster response, plant relocation, reviews of distribution routes and distribution centers, and BCP measures such as power outages and water outages.)

Efforts to reduce GHG emissions

It is important for the food industry to reduce GHG emissions throughout the supply chain, from the procurement of raw materials to the production, transportation and delivery of products. To effectively reduce emissions from the production of agricultural, livestock and fishery products, and improve the efficiency of transportation and delivery, food producers must make multifaceted efforts towards cooperation with related business operators and review the use of containers and packaging.

Efforts to reduce food loss and to make use of by-products and animal and plant residues as feed and fertilizer are unique to the food industry. As such, food producers must appropriately make their efforts better understood by disclosing the GHG emission reduction mechanisms they seek to promote. Through this approach, the sector can take advantage of the trend towards ethical consumption as a business opportunity.

(Disclosure examples)

- Development of alternative materials and products (Example: reducing GHG emissions from livestock feeding through the use of plant-based meat substitutes and cultured meat)
- Efforts to reduce GHG emissions during manufacturing (Examples: reduction of energy consumption and introduction of renewable energy by expanding the installation of energy-saving equipment)
- Reducing the weight and thickness of containers and packaging, and switching to alternative materials (Examples: 3R initiatives, switch to sustainable paper containers and packaging, such as recycled or biomass-based materials or FSC-certified materials)

- Reducing GHG emissions during transportation and distribution (Examples: joint distribution, modal shift, and efforts to optimize lead times for placing and receiving orders.)
- Efforts to reduce food loss (Examples: reducing food loss in the manufacturing process, extending expiration dates by improving containers and packaging, reducing food loss throughout the supply chain by indicating the year and month on labels, refining demand forecasts using AI, etc.)
- Efforts to utilize byproducts and animal and plant residues as feed, fertilizer, etc. (Example: reduction of petroleum-derived fertilizers, etc.)

Description of business opportunities

The development of products expected to be in higher demand with the progress of climate change, especially rising temperatures, may lead to new business opportunities in the food industry in the future.

The development of environment-friendly products will also contribute to reduced GHG emissions and open up opportunities for market expansion through the spread of ethical consumption and other purchasing behaviors guided by considerations of environmental impact.

It is important to disclose such efforts to create opportunities linked to climate change.

(Disclosure examples)

- Efforts to develop products that match the needs arising from climate change (Examples: development of products to relieve thirst in response to extremely hot weather and products to help prevent heat stroke and infectious diseases, etc.)
- Promotion of ethical consumption through environment-friendly products (Examples: procurement of certified raw materials or materials that have undergone in-house assessments based on equivalent standards, support for producers, and procurement of materials selected in consideration of sustainability in containers and packaging.)

(7) Banking

The TCFD recommendations describe risks and opportunities in the banking sector, as shown below. This section provides a supplemental guidance focused on banking.

Description of Banks in the TCFD recommendations

1. Banks

Banks are exposed to climate-related risks and opportunities through their lending and other financial intermediary activities as well as through their own operations. As financial intermediaries, banks may assume exposure to material climate-related risks through their borrowers, customers, or counterparties. Banks that provide loans or trade the securities of companies with direct exposure to climate-related risks (e.g., fossil fuel producers, intensive fossil fuel consumers, real property owners, or agricultural/food companies) may accumulate climate-related risks via their credit and equity holdings. In particular, asset-specific credit or equity exposure to large fossil fuel producers or users could present risks that merit disclosure or discussion in a bank's financial filings. In addition, as the markets for lower-carbon and energy-efficient alternatives grow, banks may assume material exposures in their lending and investment businesses. Banks could also become subject to litigation related to their financing activities or via parties seeking damages or other legal recourse. Investors, lenders, insurance underwriters, and other stakeholders need to be able to distinguish among banks' exposures and risk profiles so that they can make informed financial decisions.

Source: "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.23

In the banking sector, the aim of TCFD is the stabilization of the financial system in the event of the emergence of climate change risks. As financial supervisors and central banks move to integrate climate change into prudential regulation and monitoring, it is useful to enhance disclosure, particularly in terms of risk.

An important point, in this case, is to specify quantified risk of climate change together with framework for controlling risk. Based on the scenario analysis, it is desirable to clarify measures to enhance resilience against climate change by disclosing not only concrete figures such as the amount of future assumed physical risks and transition risks and the degree of concentration of carbon-related assets, but also internal governance and risk management systems related to climate change risks and policies for dealing with specific sectors.

On the other hand, with regard to opportunities, it is important to specify a medium- and long-term strategy for environmental consideration using financial functions and disclose how they support the efforts taken by their customers toward a low-carbon society.

In disclosing both risks and opportunities, it is important to share the concept of TCFD

recommendations through engagement with customers and to clearly explain the actions that can be taken in the future, in order to demonstrate a stance of advancing climate change responses with customers.

Scenario analysis

It is desirable to share the future amount of risk with stakeholders by estimating and disclosing the expected increase in credit costs under climate change scenarios. Though some studies on scenario analysis are given as examples⁵², there is no international or uniform method for analysis as of this writing. In performing an analysis, a bank must begin by deciding “in what manner”, “with which scenarios”, and “for which assets”. These assumptions that go into the analysis must be specified when the analysis is disclosed.

(Disclosure examples)

- Estimation and disclosure of total credit costs based on the probability of flooding for each climate change scenario (IPCC “RCP 2.6, RCP 8.5”, etc.)
- Estimation and disclosure of total credit costs based on changes in sales and costs in borrower sectors under the transition risk scenario (IEA “sustainable development scenario”, etc.)

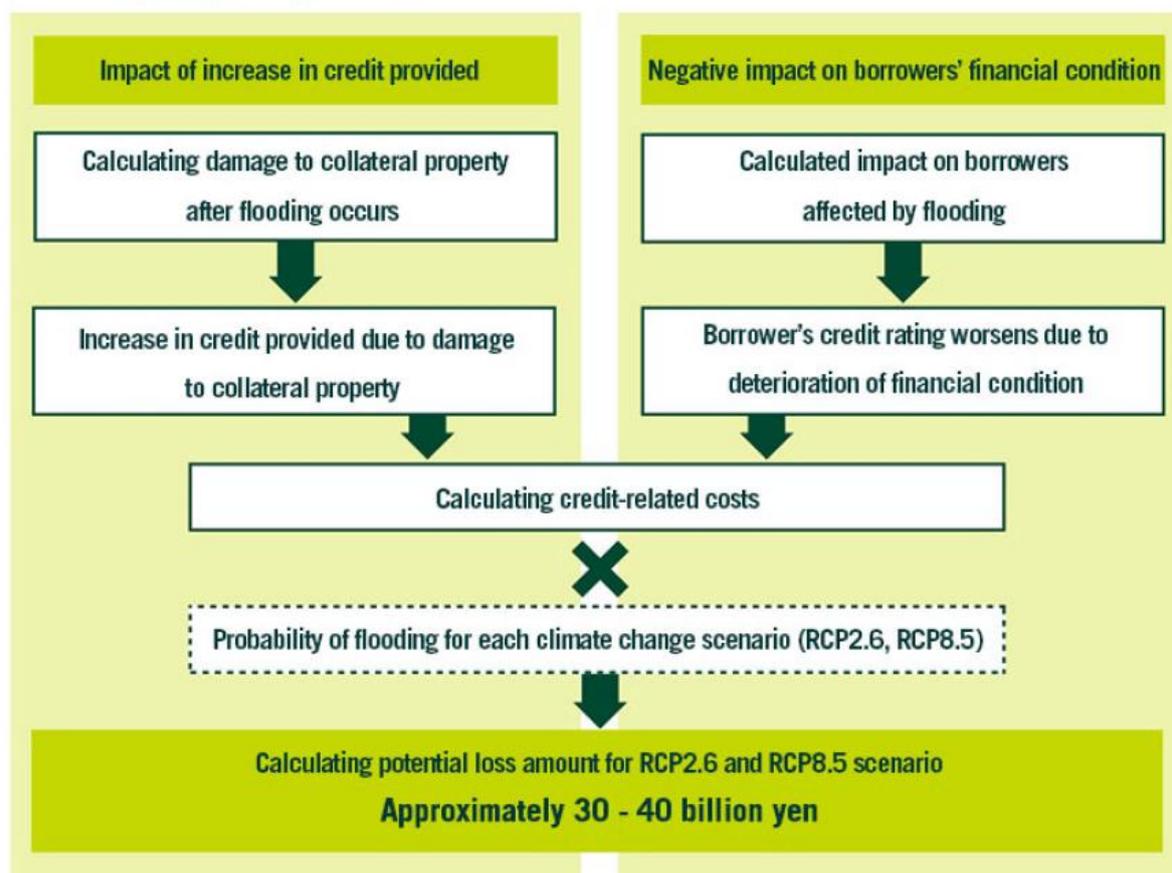
⁵² Examples of studies on scenario analysis in the banking sector include the following:

- Bank of England, 2019, Discussion Paper: The 2021 biennial exploratory scenario on the financial risks from climate change (<https://www.bankofengland.co.uk/paper/2019/biennial-exploratory-scenario-climate-change-discussion-paper>)
- Network for Greening the Financial System, 2020, Guide to climate scenario analysis for central banks and supervisors (https://www.ngfs.net/sites/default/files/medias/documents/ngfs_guide_scenario_analysis_final.pdf)

Reference: SMBC's Scenario Analysis Process and Estimated Credit Costs

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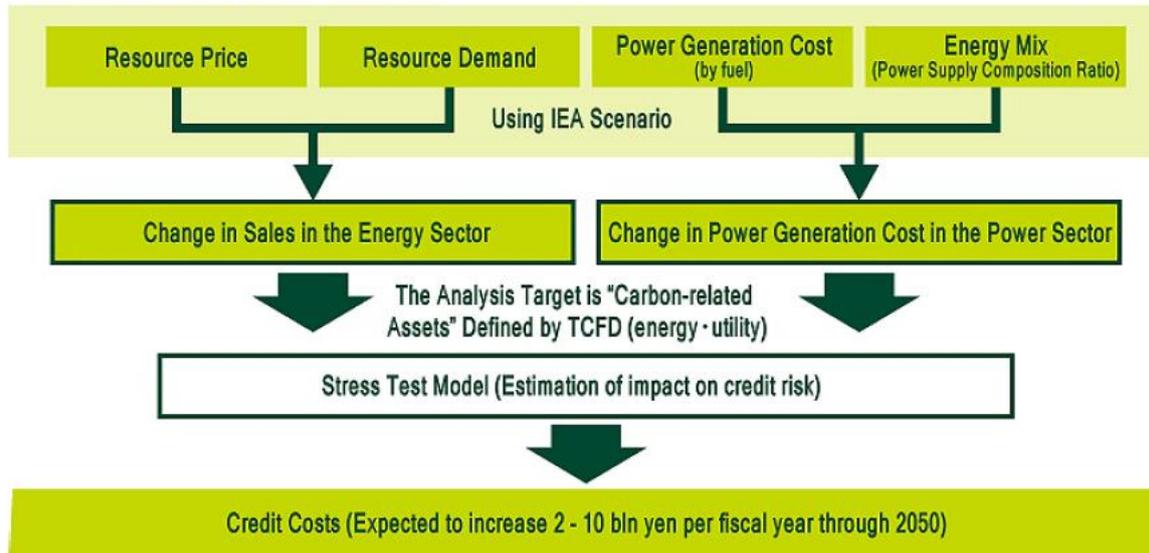


Source: Sumitomo Mitsui Financial Group, Inc. "Sustainability Report 2019" P. 55

- Risk events are identified as water disasters (floods), and the amount of loss expected to occur in the future due to water disasters is analyzed for each climate change scenario.
- Estimation of the current estimated credit costs based on (1) the amount of collateral damage in the event of a flood and (2) the financial impact on business partners (decline in sales), after identifying collateral and business partners of banks located on the water disaster hazard map prepared by the Ministry of Land, Infrastructure, Transport and Tourism
- Calculate potential future losses by multiplying the probability of flooding in each climate change scenario (IPCC "RCP scenarios")
- The total cumulative credit cost is expected to increase by approximately 30 to 40 billion yen through 2050.

<transition risk>

< Process of Analyzing Transition Risks >



Source: Sumitomo Mitsui Financial Group, Inc. "Sustainability Report 2019" P. 56

- The effects of expected changes in oil and gas prices and demand are estimated, together with power generation costs under the IEA scenarios on credit risks in the energy and power sectors.
- The estimated credit cost under the 2°C scenario is expected to increase by approximately 2 to 10 billion yen per year up to 2050, compared to the 4°C scenario (Stated Policies Scenario).

Concentration of carbon-related asset exposures

The TCFD recommends that banks disclose "concentrations of credit exposure to carbon-related assets" that are likely to be vulnerable to climate change impacts⁵³.

While carbon-related assets are defined to a degree in the TCFD recommendations, each bank has different interpretations of detailed estimation methods, such as whether the concentration of carbon-related assets is a loan-based ratio or credit-based ratio, and how to deduct renewable-energy- and nuclear-power-related exposures of electric power companies. It should be noted that comparability cannot be warranted at present.

(Disclosure example)

- Ratio of carbon-related assets to loans (or credit amounts)

⁵³ "Energy" "Utilities" in GICS (Global Industrial Classification Standard). However, water utilities, independent power producers, and renewable energy producers are excluded.

Governance and risk management systems

In order to control the future risks identified through scenario analysis and exposure to carbon-related assets, it is necessary to integrate the elements of climate change into the bank's internal governance and risk management systems, and to operate them strategically.

In doing so, it is important for a bank to clarify the involvement of its management and board of directors in climate change-related issues, and incorporate climate change risks into its risk appetite framework in the future.

(Disclosure examples)

- Reflect climate change initiatives in business strategies based on discussions at the management committee, and periodically report to the board of directors
- Report on climate change risk in a “risk committee”
- Recognize climate change as a top-priority risk and implement measures to strengthen scenario analysis and consider countermeasures at the management level

Capturing opportunities

It is important, in the theme “Strategy” to disclose the positive impact of capturing opportunities in addition to minimizing the negative impact of climate change, and to disclose the impact on medium- and long-term projects and strategies in order to contribute to the transition to a low-carbon society from the perspectives of risk management and capturing opportunities.

As regards scenario analysis disclosed under “Strategy”, it is encouraged that the banking sector to consider not only how to strengthen risk management, but also how to capture opportunities by utilizing its outcome to better understand customer needs and issues, as well as to engage with customers.

It would be useful, in this regard, to make the medium- and long-term targets clear to customers and other stakeholders, along with the roadmap for achieving those targets, and to disclose the actual progress of financing through the issuance of green bonds (providing finance for green sectors), financing for renewable energy projects, and financing for projects that contribute to climate change countermeasures such as loan products that encourage customers to address ESG and SDGs.

It should be noted that the definition of finance (whether to specialize in the environmental and climate change fields, including social fields, etc.), the types of financial services subjected to the target, and the timeline to achieve the target are left to each bank in setting its targets.

(Disclosure examples)

- Issuance of green bonds (providing funds for green sectors)
- Provision of project finance for renewable energy businesses
- Provision of loan products related to ESG and SDGs
- Medium- and long-term targets for sustainable finance

(8) Life insurance

The TCFD recommendations describe risks and opportunities in the insurance sector, as shown below. This section provides a supplemental guidance focusing on life insurance companies.

Description of insurance companies and asset owners in the TCFD recommendations.

2. Insurance companies⁵⁴

For insurance companies, climate-related risks and opportunities constitute a key topic affecting the industry's core business (e.g., weather-related risk transfer business). The scientific consensus is that a continued rise in average global temperatures will have a significant effect on weather-related natural catastrophes and will account for an increasingly large share of natural catastrophe losses⁵⁵.

Users of climate-related financial disclosures are specifically interested in how insurance companies are evaluating and managing climate-related risks and opportunities in their underwriting and investment activities. Such disclosure will support users in understanding how insurance companies are incorporating climate-related risks into their strategy, risk management, underwriting processes, and investment decisions. This guidance applies to the liability (underwriting) side of insurance activities. For insurance companies' investment activities, refer to the supplemental guidance for asset owners.

Source: "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.28

3. Asset Owners

Asset owners are a diverse group that include public- and private-sector pension plans, re-/insurance companies, endowments, and foundations and invest assets on their own behalf or on behalf of their beneficiaries. Asset owners invest according to a mandate or investment strategy set out by their oversight body or their beneficiaries. Asset owners have various investment horizons that influence their risk tolerance and investment strategies. Many asset owners have broadly diversified investment portfolios across investment strategies, asset classes, and regions and portfolios with thousands of underlying individual company and government exposures. Asset owners may hire asset managers to invest on their behalf⁵⁶.

⁵⁴ Insurance companies include both insurers and re-insurers.

⁵⁵ Intergovernmental Panel on Climate Change, Fifth Assessment Report (AR5), Cambridge University Press, 2014.

⁵⁶ In this role, asset managers also act as fiduciaries. Asset managers invest within the guidelines specified by the asset owner for a given mandate set out in the investment management agreement or the product specification.

Whether asset owners invest directly or through asset managers, asset owners bear the potential transition and physical risks to which their investments are exposed. Similarly, asset owners can benefit from the potential returns on the investment opportunities associated with climate change.

Asset owners sit at the top of the investment chain and, therefore, have an important role to play in influencing the organizations in which they invest to provide better climate-related financial disclosures. Disclosure of climate-related risks and opportunities by asset owners allows beneficiaries and other audiences to assess the asset owner's investment considerations and approach to climate change. This may include an assessment of the asset owner's integration of appropriate climate-related financial information into its investment activities in various ways, for example, in setting investment strategy, making new investment decisions, and managing its existing portfolio. By encouraging climate-related financial disclosures by asset owners, beneficiaries and other stakeholders will be in a position to better understand exposures to climate-related risks and opportunities. Further, climate-related financial disclosures by asset owners may encourage better disclosures across the investment chain—from asset owners to asset managers to underlying companies—thus enabling all organizations and individuals to make better-informed investment decisions.

Source: "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.33

Life insurance companies have two positions: as underwriters of life insurance and as institutional investors. It thus becomes necessary, in addressing TCFD recommendations, to pay attention to what is recommended for each position.

In the life insurance business, the impact of climate change on human life and health will be assessed, and the impact of climate change on business will be examined. While the impact on the life insurance business is not deemed to be substantial at present, the research being done on the relationships of climate change with health damage and mortality is still in its early stages. Life insurance companies thus need to consider how information is to be collected and incorporated into their business.

As institutional investors, insurance companies need to consider the impact of climate change on the companies they invest in, as well as their own information disclosure. These companies are required to better disclose the physical and transition risks and opportunities they experience in their engagement activities and to have an adequate understanding of the information disclosed.

Policies for addressing climate change and ESG investments and loans

Life insurance companies need to make continuous efforts to address climate change as companies. It thus becomes important to indicate how a company perceives the impacts of climate change, how this perception is reflected in its business activities, and what basic policies it has adopted. In this way, the communication of the company's basic position can be promoted to the company's investment and loan recipients as well as to the fund providers.

(Disclosure examples)

- Status of policy formulation for dealing with the environment and climate change
- Development of ESG investment and loan policy

Addressing Climate Change Risks in the Life Insurance Business

The impact of climate change on human life and health may affect insurance payments. It thus becomes important for life insurance companies to show how they understand the risks to human health caused by climate change, and how those findings are reflected in their business. In this way, life insurance companies are expected to demonstrate how they take account of climate change risks in their business strategies.

(Disclosure examples)

- Efforts to analyze the impact of short-term impacts on insurance payments due to factors such as changes in the frequency or scale of abnormal weather or natural disasters
- Efforts to identify risks such as increased morbidity and mortality due to medium- to long-term effects such as average temperature increases

Investment and loans focusing on the risks and opportunities of climate change

As institutional investors, life insurance companies need to view the transition to a low-carbon society as an opportunity for providing investments and loans, and to continuously monitor the status of the sustainable growth of its investment and loan recipients through engagement activities, etc. It thus becomes important to show how a company perceives the risks and opportunities of climate change in its investment and financing strategy, and how those perceptions are considered and reflected in its investment and financing. Ideally, a company should disclose items such as those shown in the following examples.

(Disclosure examples)

- Examples of investments and loans to companies, technologies, and projects that contribute to low carbon emissions (Green Finance), as well as its cumulative investments and loans, etc.
- Items to be emphasized in making decisions on investments and loans, points of view, etc.
- Engagement activities for investment and loan recipients (implementation of climate change-related dialogue)

Climate-related risk management process

As long-term institutional investors, it is important for life insurance companies to indicate how the portfolios are positioned with respect to transition risks and physical risks, and how they are managed. In other words, it is important to indicate how a company as an institutional investor evaluates and analyzes the information disclosed by investment and loan recipients. It thus becomes desirable to disclose specific matters such as those shown in the following examples.

(Disclosure examples)

- Status of preparation of investment and loan standards
- Analysis of climate change-related impacts on investments and loans (risks of loss in value of investments and loans associated with the transition to a low-carbon society, along with the responses to such risks)

[References]

For more on how life insurers are responding to climate change, see The Life Insurance Association of Japan, 2019, “Climate Change Starter's Guide: Impacts and Key Considerations for the Life Insurance Industry”

(downloadable from: [https://www.seiho.or.jp/activity/sdgs/climate/pdf/handbook\(en\).pdf](https://www.seiho.or.jp/activity/sdgs/climate/pdf/handbook(en).pdf))

(9) Non-life insurance

The TCFD recommendations describe risks and opportunities in the insurance sector, as shown below. This section provides a supplemental guidance focusing on non-life insurance companies.

Description of insurance companies in the TCFD recommendations

2. Insurance companies⁵⁷

For insurance companies, climate-related risks and opportunities constitute a key topic affecting the industry's core business (e.g., weather-related risk transfer business). The scientific consensus is that a continued rise in average global temperatures will have a significant effect on weather-related natural catastrophes and will account for an increasingly large share of natural catastrophe losses⁵⁸.

Users of climate-related financial disclosures are specifically interested in how insurance companies are evaluating and managing climate-related risks and opportunities in their underwriting and investment activities. Such disclosure will support users in understanding how insurance companies are incorporating climate-related risks into their strategy, risk management, underwriting processes, and investment decisions. This guidance applies to the liability (underwriting) side of insurance activities. For insurance companies' investment activities, refer to the supplemental guidance for asset owners.

Source: "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" (June 2017), P.28

As noted in the TCFD recommendations, the continuing rise in the global average temperature is said to have a significant impact on large-scale natural disasters. In Japan, the recent increases in heat waves and torrential rains, as well as the frequent occurrence of typhoons and other natural disasters, have raised concerns about the frequency of further large-scale natural disasters due to climate change.

The insurance to compensate for damage caused by natural disasters is a social infrastructure that plays a part in climate change countermeasures. The non-life insurance sector provides compensation to reduce the economic burden on companies and individuals that suffer damage, and is expected to continue playing that important social role. At the same time, the growing severity of natural disasters has increased concerns about the impacts of climate change on the sustainability of the non-life insurance sector.

Climate-related risks include not only physical risks, such as increased natural disasters due

⁵⁷ Insurance companies include both insurers and re-insurers.

⁵⁸ Intergovernmental Panel on Climate Change, Fifth Assessment Report (AR5), Cambridge University Press, 2014.

to climate change, but also transition risks that affect businesses via the environmental changes brought by the transition to a decarbonized society.

For the stable provision of insurance, the non-life insurance sector has implemented comprehensive risk management (ERM, etc.) to appropriately manage its own risks, including measures against large-scale disasters. Based on the TCFD recommendations, it is important to show how non-life insurance companies including their management, view, manage, and respond to these climate-related risks.

The non-life insurance sector also provides various services to support disaster prevention and mitigation, along with insurance products (products for Green Infrastructure, etc.) that contribute to climate change responses. These measures are taken to increase society's resilience to climate change and drive partner companies' innovation toward a decarbonized society, and are focused on areas where the non-life insurance sector can actively contribute. A company can effectively demonstrate the contribution of the non-life insurance sector to climate change responses by explaining how such measures are addressed.

Based on these considerations, the following disclosures may be considered.

Potential impacts of climate change (risk identification and assessment)

The following examples show disclosures that are expected, under the TCFD recommendations, to indicate the climate-related physical risks and transition risks that may affect the insurance business, related services, and financial conditions in the future, as well as how the impacts are perceived. If quantitative disclosure is difficult, the information may be disclosed in a qualitative form.

(Disclosure examples)

- Impacts under the assumption that the frequency and magnitude of natural disasters changed (increased insurance claim payments, impact on underwriting profit, etc.)
- Impact of environmental changes accompanying the transition to a decarbonized society (impact on insurance premiums from the changes in the industrial structure resulting from strengthened laws and regulations and the development of new technologies)

Management of strategies and risks related to climate change

Based on the risks identified above, it is recommended to indicate the strategies and policies in place and the internal systems established to address climate-related issues and manage risks.

There may be ways to develop strategies and policies specific to climate-related issues, as well as to include climate-related elements in strategies and policies for integrated risk management. Each company may explain its own strategies and policies based on its situation.

In addition, given that the TCFD recommendations encourage companies to explain their responses to climate-related issues, including the roles of their boards of directors and managements, and to indicate their approaches to managing climate-related risk, it is a good way to indicate how climate change is integrated, in the case where climate change is included in integrated risk management, as well as the internal review system including the structure of the board of directors and committees and the role of management. In addition, efforts such as stress testing and scenario analysis conducted as part of climate-related risk management, and utilization of reinsurance may be presented.

(Disclosure examples)

- Strategies and policies on climate-related issues (indicate if they are implemented as part of an integrated risk management system)
- Internal review system (structure of the board of directors / committees, roles of the management, etc.)
- Climate risk management Initiatives (initiatives in integrated risk management, etc.)
- Stress testing / scenario analysis as part of climate-related risk management, use of reinsurance, etc.

Enhancing risk management and reducing risks

As risks related to climate change are changing, methods and analysis for risk assessment may be improved through in-house research and studies, and through participation in external initiatives. Efforts such as these can increase a company's resilience to climate change by enhancing risk management and risk reduction.

Non-life insurance companies have also traditionally provided risk consulting to customers through insurance contracts, carried out activities to raise stakeholder and community awareness of disaster prevention and mitigation, and engaged in various research activities in cooperation with external organizations. By disclosing efforts that help to improve the resilience of society as a whole to climate change, companies can effectively demonstrate their contributions to society.

(Disclosure examples)

- Initiatives to enhance risk assessment and stress testing / scenario analysis related to climate change (research projects and participation in international initiatives, etc.)
- Disaster prevention and mitigation initiatives (research projects and enlightenment activities, etc.)

Opportunities brought by climate change

The TCFD recommendations call for disclosure of information not only on the risks caused by climate change, but also on the opportunities brought by climate change. Climate change may change the needs of customers for insurance, other products, and insurance-related services. Responding to these new needs also represents a new business opportunity for non-life insurance companies.

Meanwhile, new technologies with lower environmental impact are emerging toward the transition to a low-carbon society, and their emergence generates a demand for new products and services for their adoption. Furthermore, the compensation provided for new technologies is expected to make it easier for business partners to develop and promote such technologies. Compensation will thus help to spread and promote new technologies toward the transition to a low-carbon society, and will also encourage innovation by business partners.

If a company has taken measures to provide products and services that respond to these new risks and technologies, or has developed completely new products and services, or revised its existing products and services, in response to changes in the environment and customer needs, it may also present such measures in its disclosure.

(Disclosure examples)

- Provision of new products and services to respond to natural disaster risks
- Provision of products (insurance products for green infrastructure) that aim to promote climate change countermeasures
- Provision of various services to support disaster prevention and mitigation (provision of consulting services on climate-related risks to corporations, etc.)

(10) International Shipping

The TCFD Recommendations describe climate-related risks and opportunities for the Transportation group, including the shipping industry, as shown below. This section provides supplemental guidance focusing on the international shipping industry.

Description of the Transportation group in the TCFD recommendations

2. Transportation Group

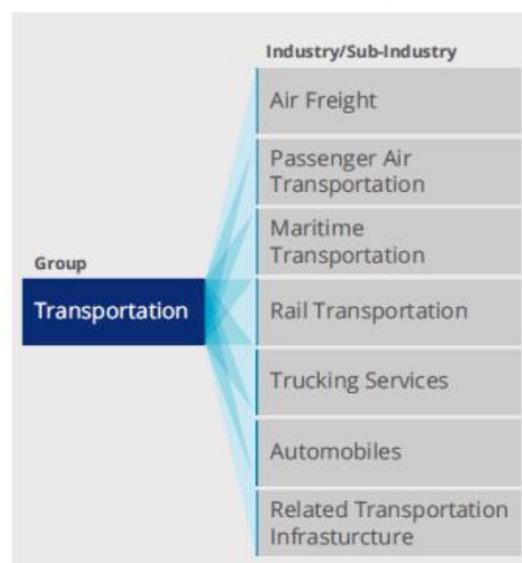
Transportation is critical to the economy and drives a significant portion of emissions and demand for energy through the production and, more important, the use phase. The industry is under increasing policy and regulatory pressure to achieve emission targets for the use phase. Increasing constraints on emissions fuel efficiency will continue to impact costs in this group, particularly around investments in innovation (new technologies and efficiencies)⁵⁹.

The Transportation Group, therefore, will likely face financial challenges from two major drivers. First, policymakers are setting stricter targets for emissions and fuel efficiency from transportation carriers. Second, new technology around low-emission/fuel-efficient carriers (e.g., electric cars) is creating a shift in the competitive and investment landscape. New technological innovations and new market entrants can weaken companies' market position, resulting in lower revenues, higher costs, and narrower margins. The effects of these two drivers may be compounded by the length of product cycles for transportation products, such as cars and trucks, and especially for air and rail and marine equipment. As with the Energy Group, investments in long-lived assets (e.g., manufacturing facilities, airplanes, ships) and longer planning horizons are relevant factors that must be taken into account when considering the climate-related risks and opportunities.

Consequently, disclosures should focus on qualitative and quantitative assessments and potential impacts of the following:

- Financial risks around current plant and equipment, such as potential early write-offs of equipment and R&D investments or early phasing out of current products due to policy constraints or shifts or the emergence of new technology.

Figure11 Transportation



⁵⁹ Moody's Global Credit Research, "Moody's: Auto sector faces rising credit risks due to carbon transition." September 20, 2016.

- Investments in research and development of new technologies and potential shifts in demand for various types of transportation carriers.
- Opportunities to use new technologies to address lower-emissions standards and increased fuel-efficiency requirements, including transport vehicles (cars, ships, planes, rail) that run on a range of traditional and alternative fuels.

Source: “Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures” (June 2017), P.56

International shipping accounts for the majority of international trade in terms of weight and supports global logistics. While the CO₂ intensity per ton-kilometer (specific CO₂ emissions) of international shipping is lower than most transport modes, CO₂ emissions from international shipping account for about 2% of global CO₂ emissions, and emissions reductions are being required. The International Maritime Organization (IMO), an United Nations specialized agency for maritime affairs, is promoting GHG reduction in international shipping.

One of the characteristics of the shipping industry is that ships generally have a long service life of about 20 to 30 years, and it takes several years from ordering to completion. For this reason, it is important to consider CO₂ reduction measures from a medium- to long-term perspective. Other notable characteristics are a) vessels are basically custom-made, making it difficult to retrofit standard equipment, and b) the shipping industry needs to be cautious about introducing new technologies since breakdowns on the high seas must be avoided at all costs.

Shipping companies use vessels chartered by ship owners, along with vessels owned by the companies themselves. Therefore, it is necessary for the entire charter chain (owners and users) to make efforts when installing energy-saving equipment that requires additional costs.

Initiatives for medium- to long-term transition

Two major changes are expected in international shipping along the decarbonization pathway: change in ship fuel and change in the transported freight. Regarding the former, in the long term, it is necessary to implement vessels which consume fuels that are not currently used. In addition to the introduction of LNG-fueled ships, which is considered as a medium-term measure, many options such as hydrogen, ammonia are under discussion, and shipping companies are required to adapt flexibly. LNG-fueled vessels are also effective as a measure against air pollution, and there are some pioneering cases of introducing LNG-fueled ships by using transition finance.⁶⁰

In addition, freight to be transported may change significantly due to changes in demand stemming from global reduction of fossil fuel consumption, increase of alternative fuels such

⁶⁰ A financial instrument designed to support GHG reduction efforts in accordance with a long-term strategy for decarbonization. Including funding to achieve steady low carbon emissions even when decarbonization technologies are not technically and economically feasible at present.

as hydrogen and ammonia, transportation of CO₂ for CCS⁶¹, and increase in renewable energy devices and rare metals. It is desirable that efforts to address such changing demands are disclosed.

(Disclosure examples)

- Efforts to utilize ships applying new technologies such as energy efficient vessels and alternative fuel vessels in merchant fleets.
- Efforts to cooperate with shipbuilders and shipowners on the conversion to ships applying new technologies such as energy efficient vessels and alternative fuel vessels.
- Changes in freight movement (i.e. changes in freight and their countries of origin) along the pathway to carbon neutrality.
- How transition risk are analyzed and reflected in governance.

Initiatives to reduce short-term GHG emissions

In order to reduce GHGs, an international treaty (MARPOL Convention) provides for the improvement of energy intensity (EEDI⁶²) for new ships (applying to ships above a certain size, to be reduced by 30% from the baseline from 2025 with more stringent targets for container ships). In addition to reducing GHG emissions, ships are also required to significantly reduce the sulfur content of their fuels from 2020. For this reason, introduction of LNG-fueled vessels is being promoted as described above.

As a short-term measure in the GHG emission reduction strategy, two systems of regulation will be imposed: EEXI regulation⁶³ for technical regulation and CII rating⁶⁴ for operational performance (Adopted in June 2021, effective from 2023). In particular, the EEXI regulation will establish a standard on CO₂ emission factor, and imposes restrictions on engine power output when the index is not attained. The CII rating on the other hand will have a five-level rating based on actual performance of fuel consumption.

In addition, one method of GHG emissions reduction which is characteristic of shipping is slow steaming. Slow steaming without facility renewal is effective, but slow steaming involving changing the ship shape to suit reduced speed as well as retrofitting of engines, etc. are being carried out. Cooperation with shippers and ports is important in implementing slow steaming.

Customers are requesting that CO₂ emissions be reduced throughout the supply chain, and these measures will reduce the transition risk to the shipping industry. In addition, reducing the CO₂ emissions and intensity of commercial vessels operated by the company can reduce

⁶¹ Carbon dioxide capture and storage. CO₂ capture and storage technology, in which CO₂ emitted from power plants and chemical plants is separated from other gases, collected, stored and injected deep into the earth.

⁶² Energy Efficiency Design Index (EEDI) is an index and requirement to keep CO₂ emissions related to fuel efficiency of new vessels below a certain level.

⁶³ Energy Efficiency Existing Ship Index (EEXI) regulation requires to keep an index similar to EEDI below a certain level with an objective to impose equivalent fuel efficiency standard for existing ships as newly-built ships.

⁶⁴ Carbon Intensity Indicator (CII) rating is a system that evaluates annual average fuel economy performance on a 5-point scale of A-E.

business risks and create opportunities.

(Disclosure examples)

- CO₂ emission intensity of vessels used by the company (applicable standards and performance. AER⁶⁵, EEOI⁶⁶, CII ratings, etc.)
- Improvements in operation (cooperation with shippers and ports to realize these goals) such as slow steaming, reduced offshore waiting, weather routing, and improved maintenance, and technical improvements such as retrofitting energy-saving equipment.

Initiatives to Reduce Physical Risk

The industry may be impacted by both acute and chronic risk such as the increase in frequency and severity of natural disasters, changes in ocean currents, and the effects of reduced sea ice. Impacts of ports and docks due to sea level rise are also expected.

(Disclosure examples)

- Establishment of guidelines and efforts for physical risk reduction such as hull strengthening.
- A system to identify physical risks and reflect them in governance.

Business Opportunities

Social change towards decarbonization also provides a new business opportunity for the shipping industry. If shipping companies adopts the use vessels using new technologies such as high-efficiency vessels, alternative fuel vessels, owns vessels with lower CO₂ emissions than conventional vessels, or if their fleet actively take measures to improve operational efficiency such as slow steaming, such measures will lead to a reduction in CO₂ emissions through the value chain of freight, and disclosure of such measures may be competitively advantageous. In order to transport hydrogen and ammonia, specialized ships will be needed. In addition, demand for copper and rare metals is expected to increase as a result of electrification. It is important to accurately grasp these new changes in demand and freight movements, and to demonstrate flexibility in responding to them.

⁶⁵ Annual Efficiency Ratio (AER) is an index of operational carbon intensity calculated using the designed deadweight of the vessel.

⁶⁶ Energy Efficiency Operational Indicator (EEOI) is the operational CO₂ emissions factor, based on amount of freight transported.

(Disclosure examples)

- Policies and outcomes for handling new freight movements such as transport of hydrogen, ammonia, and CO₂ toward carbon neutrality
- Initiatives to introduce high-efficiency vessels, alternative fuel vessels, and other vessels that use new technologies, and to work on novel method of navigation
- Organizational structure to identify risks and opportunities related to the above and reflect them in corporate governance.

A. Significance of this Guidance

Discussions related to TCFD have previously been led mainly by the financial authorities and financial industry players. Moving forward, not only are financial companies be expected to meet requirements of the financial authorities, but non-financial companies also need to actively communicate their strengths to investors and other stakeholders. Non-financial companies and investors and other stakeholders will thus need to have constructive dialogue to deepen their mutual understanding, in order to realize the virtuous cycle of environment and growth.

The TCFD recommendations are a useful tool for dialogue between non-financial companies and investors and other stakeholders. This Guidance, therefore, presents commentaries on the TCFD recommendations and supplemental documents and sector-specific recommended disclosures to allow non-financial companies to make effective climate-related financial disclosures in accordance with the TCFD recommendations.

It is anticipated that many companies support the TCFD recommendations and to make better disclosures in accordance with this Guidance.

B. First-try Disclosures

On the other hand, disclosure in accordance with the TCFD recommendations requires careful consideration of many points, including in particular scenario analysis, before a company can begin to provide the information when it starts the disclosure. As such, there may be cases where a company hesitates to make disclosures or to support the TCFD recommendations. In view of this, the TCFD has presented an illustrative roadmap to encourage companies to initially make disclosures on the types of information they can manage, such as their Governance and Risk Management, and then to gradually move on to disclosures related to Strategy and Metrics and Targets over a time frame of three years. As seen above, disclosure in accordance with the TCFD recommendations should not necessarily be thorough from the start. The important point for a company is to begin the disclosure process and improve and expand its disclosures step by step.

C. Refining for Better Disclosure

As many companies begin to work on disclosure, the expertise of the disclosure preparers and best practices of disclosure will accumulate. As a result, there will be more “questions” that need to be explained in Chapter 2 of this Guidance, and more case examples of disclosures to clarify those questions.

If more non-financial companies disclose, it will be possible to improve the sector-specific

recommended disclosures presented in Chapter 3 and to consider expanding the industrial sectors. On a global level, the SASB has presented sector-specific sustainability metrics, while WBCSD is undertaking activities for sector-specific disclosures. As seen above, there have already been moves to work on sector-specific disclosure globally, and Japan is ready to actively contribute to such moves. This revision of the TCFD Guidance is based on such recognition.

D. Increasing Corporate Value through TCFD Disclosure

Investors and other stakeholders have emphasized the effectiveness of engagement as a measure to combat climate change in recent years⁶⁷. The Green Investment Guidance published by the TCFD Consortium in October 2019 states, “As a practice of investors and other stakeholders, it is more important to be engaged in dialogue with companies to facilitate their climate actions than to simply divest based on superficial criteria; engagement can lead to the enhancement of corporate value through improved efforts, thus increasing opportunities for investment.”

As these engagement efforts become more active, it will be important for companies to actively engage in TCFD disclosure and deepen their engagement with investors and other stakeholders through disclosure in order to enhance their future corporate value. In order to foster such relationship between companies and investors and other stakeholders, it is desirable that information disclosure be conducted in a voluntary and flexible manner. There is a concern that excessive standardization of disclosure content can have a negative impact on the decision-making of investors and other stakeholders. The TCFD Consortium has called on policymakers and other stakeholders in Japan and abroad on the above points⁶⁸.

The TCFD Consortium intends to continue its efforts to further enhance the content of this Guidance by refining the commentaries pertaining to TCFD disclosure, expanding sector-specific disclosure recommendations, and adding disclosure case examples, in order to enhance corporate value through TCFD disclosure.

⁶⁷ "Engagement takes time and effort, but might be the most effective way to accelerate the transit to a low-carbon economy while avoiding the situation of stranded workers and communities." (Investor Leadership Network, 2019, TCFD Implementation: Practical Insights and Perspectives from Behind the Scenes for Institutional Investors, p. 18),

⁶⁸ "Towards a More Decision-Useful TCFD Disclosure"(https://tcf-consortium.jp/en/news_detail/20081201)

Appendix 1 :

Members of the TCFD Consortium Steering Committee, List of GIG Supporters, and Number of TCFD Consortium Members

(1) Members of the TCFD Consortium Steering Committee

*In alphabetical order

[Chair]

Kunio Ito Director of Hitotsubashi CFO Education and Research Center

[Steering Committee member]

Takao Aiba Project General Manager, Environmental Affairs Div., Advanced R&D and Engineering Company, Toyota Motor Corporation

Takehiro Fujimura Member, Task Force on Climate-related Financial Disclosures (TCFD) (General Manager Corporate Sustainability and CSR Department, Mitsubishi Corporation)

Yasunori Iwanaga Chief Responsible Investment Officer, Amundi Japan Ltd.

Masaaki Izumiya General Manager, Environment Division, Nippon Steel Corporation

Masaaki Nagamura Fellow, General Manager, International Initiatives, Corporate Planning Department, Tokio Marine & Nichido Fire Insurance Co., Ltd.

Manabu Shibata Director, ESG Promotion, Kao Corporation

Kazunori Takahashi Deputy General Manager, Sustainability Promotion Division, Hitachi Ltd.

Keisuke Takegahara Executive Officer, Deputy Chief Research Officer, Chief Manager of Sustainability Management Office, Corporate Planning & Coordination Department, Development Bank of Japan Inc.

[Chair of the Information Utilization Working Group]

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(Note) Affiliation and position as of July 27, 2020.

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Appendix

(2) List of GIG Supporters

GIG Supporters are investors and other stakeholders that utilize or plan to utilize the Green Investment Guidance. Case studies of climate information disclosures that should be referred to in Japan and abroad were recommended in the preparation of this TCFD Guidance 2.0.

1. BNP Paribas Asset Management Co., Ltd.
2. Amundi Japan Ltd.
3. Manulife Investment Management Co., Ltd.
4. Nomura Asset Management Co., Ltd.
5. Nikko Asset Management Co., Ltd.
6. Nippon Life Insurance Company
7. T & D Life Group
8. Mitsubishi UFJ Trust and Banking Corporation
9. Asset Management One Co., Ltd.
10. Resona Asset Management Co., Ltd.
11. Sumitomo Mitsui Trust Asset Management Co., Ltd.
12. BlackRock Japan Co., Ltd.
13. Sompo Asset Management Co., Ltd.
14. Tokio Marine Asset Management Co., Ltd.

(Fourteen companies in total, in random order, as of July 27, 2020)

(3) Number of TCFD Consortium Members

Total of 271 organizations (as of July 27, 2020)

Appendix 2 :

List of Key Relevant Literatures Reviewed During the TCFD Guidance Revision

#	Name	Year	Summary
1	<u>IEA Energy Technology Perspectives</u>	2017	A projection by IEA focusing on energy technologies. Provides a forecast that is further into the future than WEO.
2	<u>IEA World Energy Outlook</u>	2019	A long-term forecast on energy-related issue, published annually by IEA.
3	<u>WBCSD: TCFD Preparer Forums</u>	2018 and onwards	Formulates TCFD implementation guidance for industrial sectors, with the cooperation of key companies. To date, guidance for the oil and gas sector, chemical sector, electric utilities sector, food, agriculture and forest products sector, and construction and building materials sector are published
4	<u>Climate Disclosure Standards Board (CDSB) and Sustainability Accounting Standards Board (SASB): TCFD Implementation Guide</u>	2019	Describes the alignment of CDSB Framework and the SASB standards with TCFD recommendations.
5	<u>International Institute of Finance (IIF): Climate-related Financial Disclosures: Examples of Leading Practices in TCFD Reporting Financial Firm</u>	2019	Provides an overview of implementation of TCFD recommendations by financial institutions.
6	<u>IIRC : Corporate Reporting Dialogue, Driving Alignment in Climate related Reporting</u>	2019	Report on initiative to improve the consistency of the framework and standards related to corporate reporting, and to contribute to its disclosure and use.
7	<u>CDSB / SASB: TCFD Good Practice Handbook</u>	2019	Compilation of good examples of TCFD-based disclosure, with descriptions on them.
8	<u>Investor Leadership Network (ILN): TCFD Implementation Practical Insights and Perspectives from Behind the Scenes for Institutional Investors</u>	2019	Summary of issues to be noted by institutional investors in implementing TCFD recommendations
9	<u>Financial Reporting Council (FRC): Climate-related reporting: Where to next?</u>	2019	Provides an overview of investors' expectations and preparer perspectives on responding to TCFD recommendations.
10	<u>Network for Greening the Financial System (NGFS): A Sustainable and Responsible Investment Guide for Central Banks ' Portfolio Management</u>	2019	Provides guidance on responsible investment by central banks
11	<u>BCS Consulting: Task Force on Climate-related Financial Disclosures (TCFD) Recommendations: Global Progress Report for the Banking Sector</u>	2019	Provides an overview of disclosure by financial institutions.
12	<u>TCFD Consortium: Guidance for Utilizing Climate Information to Promote Green Investment (Green Investment Guidance)</u>	2019	Guidance for investors to better understand the information disclosed based on TCFD recommendations.

#	Name	Year	Summary
13	<u>Life Insurance Association of Japan: Climate Change Starter's Guide</u>	2019	Provides guidance for life insurance companies in charge of dealing with climate change explaining the basics of responding to climate change.
14	<u>Global Sustainable Investment Alliance (GSIA): Sustainable Investors Poll on TCFD Implementation</u>	2019	Survey on the implementation of TCFD recommendations by financial institutions.
15	<u>Bank of England: The 2021 biennial exploratory scenario on the financial risks from climate change</u>	2019	A proposal on climate risk scenario analysis to be conducted by the Bank of England in 2021.
16	<u>International Association of Credit Portfolio Managers (IACPM)/Oliver Wyman: Climate Change: Managing a New Financial Risk</u>	2019	Survey and recommendations for IACPM member companies consisting of financial institutions.
17	<u>European Financial Reporting Advisory Group (EFRAG): How to improve Climate-Related Reporting</u>	2020	Guidance prepared for the purpose of improving corporate reporting and sharing good practices.
18	<u>Ministry of the Environment: Recommendations for Planning Management Strategies Using TCFD - A Practical Guide for Scenario Analysis Incorporating Climate-Related Risks and Opportunities ver 2.0</u>	2020	A practical guide to help companies implement scenario analysis in line with TCFD recommendations.
19	<u>CDSB: TCFD to do list How do I know I've met the TCFD recommendations?</u>	2020	A checklist of nine steps to ensure disclosure consistent with the TCFD recommendations.
20	<u>CDSB/CDP: The building blocks Connecting CDP data with the CDSB Framework to successfully fulfill the TCFD Recommendations</u>	2020	A guidance to effective disclosure based on TCFD recommendations using data for prepared for CDP and the CDSB framework.
21	<u>Network for Greening the Financial System (NGFS): Guide to climate scenario analysis for central banks and supervisors</u>	2020	A guidance to conduct scenario analysis to evaluate climate risk for central banks and supervisors.