Transition Finance Follow-up Guidance

~ Guidance for an effective dialogue with fundraisers ~

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Financial Services Agency,
Ministry of Economy, Trade and Industry
and Ministry of Environment

Financial Services Agency
METI
Ministry of the Environment

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Preface

Since the adoption of the Paris Agreement in 2015, the IPCC[1]'s 1.5°C Special Report and discussions at COP26 have triggered an increase in the number of countries and regions that have declared carbon neutrality targets. As momentum for decarbonization grows worldwide, Japan has also made international commitments to reduce greenhouse gas (referred to as "GHG") emissions by 46% in FY2030 and to achieve carbon neutrality by 2050.

Furthermore, the Cabinet approved “Basic Policy for the Realization of GX” in February 2023. It is a policy that views carbon neutrality as a growth opportunity, driving the Green Transformation (referred to as "GX[2]"). The policy includes sector-specific timelines and mentions investment support to promote GX.

To achieve carbon neutrality worldwide, it is necessary to go beyond established clean technologies and embrace innovation. Transition finance[3] plays a crucial role as a financing method to enable decarbonization aligned with long-term transition strategies[4] for sectors that currently face challenges in reducing emissions (known as hard-to-abate sectors), due to technological limitations. These sectors exist not only in our country but also in other Asian nations with similar regional structures, making such efforts significant for global decarbonization and leading our country to initiate the innovation. Building on this background, Japanese market has been at the forefront by implementing measures[5] to facilitate the utilization of transition finance, reaching a cumulative size of approximately 1 trillion yen[6] by the end of FY2022.

Furthermore, financial institutions play a significant role in achieving decarbonization through efforts such as transition finance and engagement[7] with fundraisers. Financial institutions participating in international financial alliances like GFANZ[8] have set ambitious targets to achieve net-zero emissions, including GHG emissions financed by loans and investments (financed emissions), by 2050 and have committed to contributing to decarbonization through funding.

On the other hand, the decarbonization pathways can vary depending on industrial sectors, regional characteristics, and individual company strategies, making the transition pathway diverse. There are also criticisms and doubts about the effectiveness and potential greenwashing associated with transition finance, particularly in sectors where decarbonization technologies are not yet viable. Moreover, temporary increases in financed emissions may hinder financial institutions from achieving their own mid-term decarbonization targets, leading to concerns on investing in hard-to-abate sectors and divestment in the long run.

In this context, the key to scaling up the efforts by financial institutions to decarbonize the real economy through

1 Intergovernmental Panel on Climate Change known as the IPCC, is an intergovernmental organization established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP).

2 The term refers to the transformation of the entire economic and social system to achieve carbon neutrality by 2050 and meet the greenhouse gas emission reduction targets as a country by 2030, considering them as opportunities for economic growth and realizing emission reduction and improved industrial competitiveness.

3 Transition finance is a financing approach that aims to support companies that are trying to steadily reduce GHG emissions in accordance with a long-term strategy to achieve a decarbonized society.

4 A transition strategy encompasses target years for achieving carbon neutrality, emission reduction goals, specific measures with set deadlines, and a governance framework for effective strategy execution.

5 In line with the “Climate Transition Finance Handbook” developed by the International Capital Market Association (ICMA), the "Basic Guidelines on Climate Transition Finance" (referred to as “the Basic Guidelines”) have been formulated, taking into account the domestic characteristics. These guidelines serve as a reference for fundraisers to consider climate change measures and for financiers to evaluate such initiatives. Sector-specific technology roadmaps based on industrial characteristics have been developed, and various measures such as implementing model projects to accumulate case studies for market expansion have been undertaken.

6 The information is sourced from the Ministry of the Environment's Green Finance Portal, the Ministry of Economy, Trade and Industry's website, "Transition Finance," and other public disclosures. Please note that the loan financing amount includes undisclosed data obtained through interviews and other means.

7 Engagement entails purposeful and constructive dialogues initiated by institutional investors and other stakeholders with current or potential investees. The GFANZ's Financial Institution Net-zero Transition Plans, released in November 2022, provide detailed insights on the engagement strategy (p.61 onwards).

8 GFANZ (Glasgow Financial Alliance for Net Zero) is a voluntary coalition of financial institutions whose establishment was declared at COP26 in November FY2021, with over 550 member institutions from more than 50 countries as of the end of FY2022

transition finance is for fundraisers to develop and disclose a credible transition strategy, and for financiers to support and facilitate its steady execution through engagement.

Based on the above, the Taskforce on Preparation of the Environment for Effective Transition Finance has developed this document for financial institutions and investors, with the aim of improving the credibility and effectiveness of transition finance, particularly by ensuring the steady execution of transition strategies of post-execution of transition finance and enhanced corporate value.

This document is intended as a referential guidance for follow-up purposes, and it is expected that engagement with fundraisers will be conducted in accordance with each financiers' policies.

Introduction

1. Purpose and expectations

This document focuses on the post-execution of transition finance and aims to promote steady efforts (corporate transition) towards decarbonization and improve the credibility and effectiveness of transition finance.

Improving the credibility and effectiveness of transition finance requires a two-way approach involving both fundraisers and financiers. Fundraisers need to drive steady decarbonization efforts and report them appropriately to financiers, while financiers are expected to review the progress of individual financing projects, such as fund allocation and environmental impacts, and engage in dialogue regarding fundraisers' policies considering uncertainties in the business environment.

This document aims to facilitate initiatives aligned with fundraisers' decarbonization strategies through a follow-up activity by financiers and provide practical guidance for practitioners on the basic concepts and key points of post-funding follow-up. Specifically, it provides information on the practices and key points to consider when reviewing strategies, goals, and progress of target projects related to transition finance.

The primary audience is assumed to be bond investors. This is because while loans and bonds are the main components of transition finance, compared to loans, which generally involve more bilateral transactions, bond investors are likely to have limited opportunities oof engagement with fundraisers. Therefore, the content of this document is designed to be more practical for bond investors in terms of acquiring relevant information and engaging in dialogue regarding transition finance. However, the points to consider during follow-up activities often apply across various asset classes, thus, it is also expected for various types and sizes of financiers, including banks and asset managers to refer to this document.

Furthermore, since this document organizes the perspectives and matters that financiers should consider during follow-up activities, it is expected to be used by fundraisers as a reference guide when conducting reporting and participating in engagement.

2. Contents

This document consists of two parts. Chapter 1 provides the definition, purpose, and basic concepts of a follow-up . Chapter 2 summarizes the practices and key points of the follow-up along the flow and presents several case studies to help readers visualize the process of follow-up.

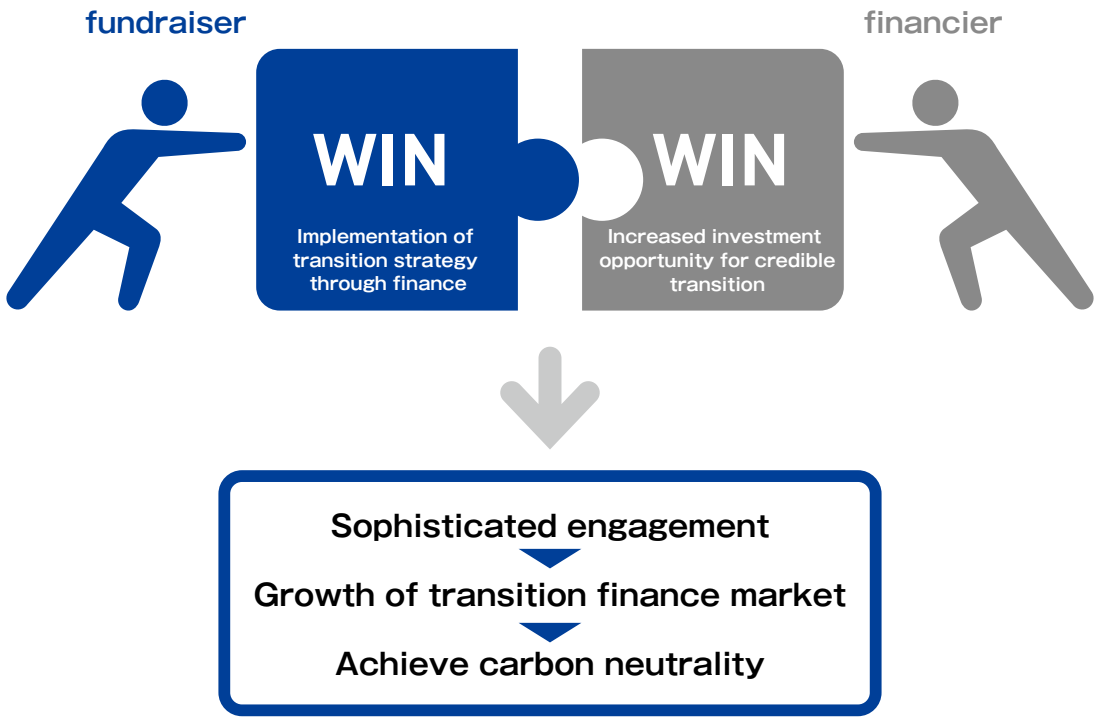
Additionally, this document includes three appendices at the end. Appendix 1 provides a reference list of key points and checklists for practical use, providing an overview of chapter 2 section 2 and onwards. Appendix 2 focuses specifically on follow-up practices in bonds, considering the different relationship dynamics between fundraisers and financiers. Appendix 3 summarizes sectoral-specific points extracted from technology roadmaps which financiers should consider for follow-up activities.

Chapter 1

1. Definition of follow-up

Follow-up refers to the regular dialogue between fundraisers and financiers, taking into account the dynamic nature of transition finance and the post-execution environmental changes, to discuss progress, future developments, and other related matters on decarbonization.

It should be noted that the definition of transition finance includes the definition by the Basic Guidelines and GFANZ[9]. Therefore, the scope of the follow-up activities is not limited to transition-labeled projects. However, considering the broad concept of transition finance, priority can be given to projects with transition labels.



2. Basic approaches for follow-up activities

Transition efforts in hard-to-abate sectors involve continued investment in transition technologies to achieve ambitious carbon neutrality goals based on optimal judgment. It is crucial to meet consumers' current needs for stable products and services while minimizing emissions. Innovative technologies and infrastructure development act as catalysts for decarbonization in these initiatives. The path to carbon neutrality varies across industrial sectors and individual business portfolios. In the context of transition finance, it should be noted that progress after fundraising may exceed or fall short of initial expectations for strategies and individual projects, though such temporary changes do not necessarily hinder the achievement of long-term transition goals.

Considering these factors, it is vital to accurately understand the changes in the circumstances faced by fundraisers

9 Refer to "Financial Institution Net-zero Transition Plans" P8~13 published by GFANZ.

from the time of fundraising and execution.

It is conceivable that certain cases, such as research and development investments, may not show significant progress within a few years of finance implementation. However, regular follow-up activities, observing progress on a yearly basis, is meaningful not only for tracking the progress of the target projects but also for assessing strategies and governance.

The follow-up activities discussed in this document is based on existing principles and disclosure frameworks required for fundraisers. It does not impose additional disclosure requirements but may recommend supplementary explanations and disclosures to enhance transparency and reliability based on existing principles.

1. Purposes of the Follow-up Activities

The purpose of a follow-up activities is to support fundraisers in executing transition strategies effectively, considering changes in the external and internal business environments. It is important to confirm, through dialogue, that the fundraisers' current transition initiatives align with the best efforts given the business environmental changes. These dialogues are expected to build trust and pave the way for appropriate fundraising to achieve decarbonization. It may involve having shared understanding on environmental changes and its impact, and the required responses if needed.

2. Reference Materials for Follow-up Activities (examples)

- Frameworks presented by fundraisers
- Disclosed information such as IR materials (e.g., integrated reports, environmental data books, green bond reports)
- Explanations during roadshows
- Second Party Opinions, etc.

3. Underlying Principles

In the Follow-up activities, it is important to keep in mind the differences in assets, formats, and sector characteristics. For details, refer to the following.

Consideration of the difference in assets (bonds and loans)

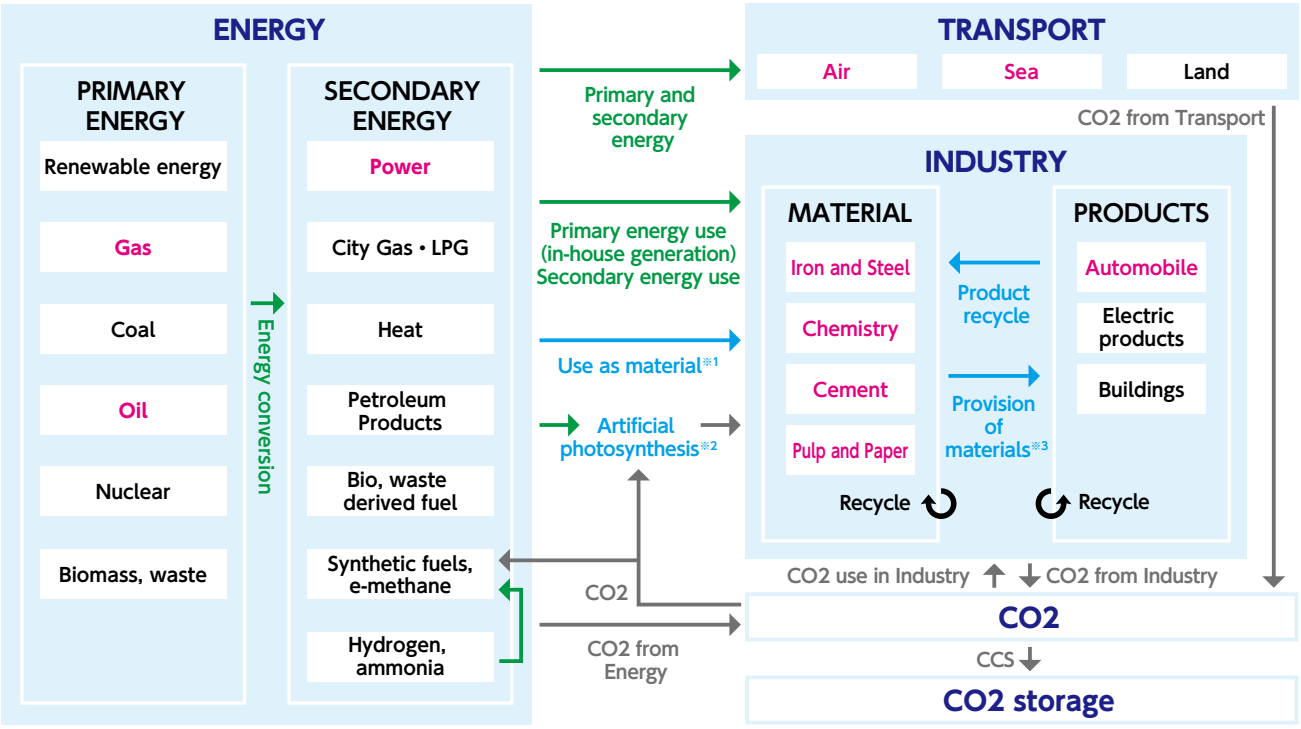
Bonds and loans differ in terms of financiers, funding size, duration, and repayment flexibility. These differences may impact the timing and approach of the follow-up activities. Specific examples and approaches for bond investors are provided in Appendix 2. However, basic methods practices and key points to consider in follow-up activities are generally applicable across various assets.

Consideration of the format (use of proceeds instruments and general corporate purpose instruments)

Different aspects need to be confirmed during follow-up activities depending on whether the use of proceeds is specified or not. For example, in the case of use of proceeds instruments, the focus of follow-up will be on the projects (use of proceeds) along with the transition strategy. On the other hand, for general corporate purpose instruments, the focus will be on assessing the progress of the designated transition strategy and Sustainability Performance Targets (referred to as " SPTs "). Chapter 2 provides details on the points to consider and key areas based on these differences.

Consideration of sector specific characteristics

Pathways to decarbonization vary based on country and sector-specific characteristics. Accurate understanding and consideration of sectoral characteristics are crucial during follow-up activities, as pre-execution of transition finance. These sectoral characteristics should be consistently taken into account, irrespective of the follow-up's purpose. Note that comprehensive understanding of hard-to-abate sectors may require a broader view beyond individual sectors and companies[10], considering the mutual influence among industries in their transition to a decarbonized society. (Refer to the accompanying diagram for more information.)



feedstock energy CO2 **Example** Sectoral technology roadmap (with URL)

※1 Currently, coal is used as a raw material in the manufacturing of steel and cement, while petroleum products are utilized in the production of chemicals.
※2 Artificial photosynthesis is a technology that utilizes solar energy to separate hydrogen from water and produce chemicals from that hydrogen and CO2.
※3 The materials industry provides essential materials for a decarbonized society, such as high-grade steel used in electric vehicles (EVs), among others.
※4 The accompanying diagram illustrates the primary flow of raw materials and energy, though some elements have been omitted for the sake of simplicity.

(Sector Relationship *refer to the URLs in the diagram for sector-specific technology roadmaps.)

10 Refer to Appendix 3 for the characteristics of each hard-to-abate sector where a summary of sector-specific technology roadmaps is provided.Note that roadmap for air (aviation sector) is currently provided in Japanese only.

Furthermore, it's important to note that efforts to contribute to society's decarbonization may not immediately reflect in a company's own GHG emissions reduction. Companies that sell low-carbon or decarbonized products to support decarbonization may experience temporary increases in GHG emissions. Certain scenarios exist where emission levels are intricately intertwined with the energy consumption and infrastructure utilized by other entities. For comprehensive insights into specific sectors, refer Appendix3 and the sector-specific technology roadmaps. It is important to grasp not only the distinct characteristics of individual companies and sectors, but also to comprehend the undertakings of interconnected sectors involved in the supply of energy, products, and raw materials, all while duly considering sector-specific attributes.

Chapter 2

1. Follow-up activities' flow and assumptions

To conduct a Follow-up, shared understanding regarding transition strategies and the underlying industrial characteristics between fundraisers and financiers during structuring and executing of the transition finance are crucial.

Follow-up activities, as described in Chapter 1, Section 2, are desirable to be conducted regularly on post-execution of transition finance. This chapter summarizes the key points for follow-up activities, starting from building shared understanding during structuring and execution.

Section 2: Shared understanding of the transition strategy

Section 3: Dialogue on strategy, targets, decarbonization efforts, and future policies in relation to business environment changes

2. Shared understanding of the transition strategy

It is anticipated that the business environment envisioned during strategy formulation may change post-execution of finance. Therefore, follow-up discussions aim to address the expected impact of environmental changes and the need for countermeasures (see Chapter 2, Section 3 for details) resulting from shifting business environments. As a result, fundraisers and financiers should share a shared understanding of strategic assumptions about the business environment during fundraising. Specifically, this involves verifying the scenarios referenced by fundraisers and the technological and political trends considered as assumptions at the time of fundraising. For instance, financiers may confirm the fundraisers' assumption about the timeline for the introduction of specific new energy sources (e.g., hydrogen) to successfully implement planned initiatives.

Additionally, it is crucial to confirm the references used by fundraisers for their goals and SPTs, such as IEA[11] scenarios or SBTi[12], when establishing those goals.

Key considerations regarding strategic assumptions and targets can be found in the framework, integrated reports, and websites established during the structuring of transition finance. Second-party opinions and evaluation agency roadshows can also serve as sources of verification.

3. Dialogue on strategy, targets, decarbonization efforts, and future policies in relation to business environment changes

This section outlines expected practices and key points for dialogue to confirm the progress of fundraisers' initiatives and agree on future policies. The primary focus is on the fundraiser' strategies, goals, and decarbonization efforts (use of proceeds).

11 IEA (International Energy Agency) was established in 1974 as an autonomous agency within the framework of the OECD. It covers energy policies in general and develops scenarios for achieving a decarbonized society. Examples of these scenarios include the Assumed Policy Scenario (APS), which assumes the fulfillment of all climate-related commitments by governments worldwide, and the Net-Zero Emissions (NZE) scenario, which is based on achieving net-zero emissions by 2050.

12 SBTi (Science Based Targets initiative) is an initiative led by organizations and companies to set science-based climate goals.

Expected Practices for Follow-up

In the event where assumptions underlying the transition strategy change, fundraisers must adapt and implement initiatives in line with the most recent scienced based pathways. Financiers should verify fundraisers' active engagement in these initiatives. Therefore, it is crucial to engage in dialogue considering not only specific projects (use of proceeds) and Sustainability Performance Targets (SPTs) associated with individual financing cases like transition bonds or loans but also the overall impact on the entire transition strategy.

Additionally, financiers are expected to gather information on any changes in the business environment, particularly the external factors, in relation to the assumptions made during finance structuring and execution (as described in Chapter 2, Section 2) before initiating the follow-up. Understanding these changes is vital as they influence fundraisers' initiatives and form the basis for discussing future policies.

During the follow-up process, it is important to confirm and engage in dialogue with fundraisers about specific initiatives, including quantitative aspects such as emission reduction levels and qualitative aspects such as efforts towards decarbonization.

- Transition strategy: A transition strategy refers to a strategic plan for science-based GHG emission reduction targets. Engage in dialogue and review future technologies or research and development initiatives planned to achieve fundraisers' carbon neutrality targets.
- Targets: Verify and discuss fundraisers' progress towards emission reduction targets and other decarbonization goals (e.g., renewable energy procurement, decarbonized fuel supply). Specifically review the emission reduction targets. For general corporate purpose instruments, discuss the established Sustainability Performance Targets (SPTs).
- Decarbonization efforts (mainly for use of proceeds): In the case of use of proceeds instruments, review the progress of the use of proceeds (Demonstration, technological development, implementation status, etc.), fund allocations, and the environmental impact brought by the project. Pay close attention to nearing repayment deadlines or completed fund allocations and discuss actual achievements in environmental improvements[13]. Refer to specific yearly emission reduction target for SPTs. If yearly targets are not set, discuss significant changes in fundraisers' approach and direction.

Financiers should first confirm whether the above three points have been appropriately disclosed or reported. Expected practices are disclosure requirements for fundraisers according to the Basic Guidelines and other principles. If disclosure is insufficient, financiers are expected to confirm the actual performance, and request disclosure and reporting in line with the Basic Guidelines and principles through the follow-up session.

Subsequently, dialogue takes place to establish a shared understanding of past accomplishments and future initiatives, taking into account changes in the business environment. Dialogue related to changes in the business environment can be broadly categorized into three types.

- When anticipated progress and actual achievements during the funding process differs due to changes in the business environment or other factors
- When there is a need to reassess the overall transition strategy due to changes in the referenced roadmap or other factors

13 In particular, reporting on project-related information, such as fund allocation status and environmental impacts, is required not only at the repayment deadline but also throughout the period until the funds are fully allocated.

- When there are currently no observed impacts, but future changes in the business environment are expected to affect the initiatives of fundraisers

When anticipated progress and actual achievements during the funding process differs due to changes in the business environment or other factors

Changes in the business environment can lead to actual achievements surpassing or falling short of initial expectations. These environmental changes can impact not only the fund allocation status and SPTs of individual finance, but also the emission reduction pathways and overall transition strategy of fundraisers. Technological advancements, for example, may result in more favorable environmental progress than anticipated. Similarly, in SPTs, technological developments can lead to earlier achievement of targets. Conversely, delays in technology development can impede expected progress in environmental improvement and SPTs.

In such cases, since fund allocation and SPTs were based on assumptions made during the funding process, there is no need to question the established framework simply because actual outcomes differ from initial expectations. However, it is essential for fundraisers and financiers to engage in dialogue, sharing the potential impacts of business environment changes on the transition strategy and discuss future polices. Through this dialogue, financiers can support the consistent efforts of fundraisers while effectively adapting to changes in the business environment.

When there is a need to reassess the overall transition strategy due to changes in the referenced roadmap or other factors

Even if there are no changes in technology development trends, reassessment of overall transition strategy may be necessary due to changes in referenced roadmaps or required ambition levels. For example, if Japan's GHG reduction targets (NDC[14]) based on the Paris Agreement are updated to more ambitious goals, it is anticipated that the transition strategy will be revised accordingly. While such changes may not require modifications to specific fund allocation and SPTs in transition finance, a review of the transition strategy for fundraisers may be warranted. Financiers are expected to confirm fundraisers' awareness of these revisions, taking into account the changes from the assumptions made during the funding process.

Changes in the business environment are expected to affect the fundraisers' efforts in the future, although no impact is currently seen

Financiers are also expected to engage in dialogue with fundraisers about potential changes in the business environment that could affect progress, even no current impacts are observed. This includes considerations such as price fluctuations of raw materials and fuels, as well as the environmental and social impacts related to procurement. Sharing this awareness early on can be beneficial for the smooth implementation of fundraisers' transition strategies and overall support of financiers.

Key Points of Follow-up

1) Competitive considerations in disclosure

Regarding achievements, it is generally necessary to disclose and report as outlined in the Basic Guidelines and

14 Nationally Determined Contributions (NDCs) are required to be submitted by countries that have ratified the Paris Agreement.

various principle. However, financiers should note that disclosure of detailed information such as research and development status and investment amounts may be challenging from a competitive standpoint.

2) Impact of transient business environment changes

The business environment is constantly changing, and it is expected that initiatives and efforts may not progress as planned during fundraising. Changes in the business environment can be categorized into two types: transient and structural. While discussing measures for transient changes may not always be necessary, dialogue regarding future strategies and approaches will be required for structural changes, as outlined in Section 3. Transient changes refer to unforeseen events, such as a temporary increase in total emissions due to increased demand for a specific product without affecting emission intensity. It is crucial for fundraisers and financiers to have a shared understanding of the background and transient nature of such changes. Additionally, it is possible to request explanations and disclosures from fundraisers regarding transient changes, including background information.

3) Nonlinear pathways

When it comes to emission reduction targets and related SPTs, it is important to be aware that significant progress may not be observed depending on the timing of follow-ups. For example, consider a funding scenario where the SPTs involve a 20% reduction in GHG emissions five years after procurement. If this 20% reduction is achieved through the renewal of manufacturing facilities, there may not necessarily be a consistent reduction trend every year, as the reduction occurs during facility renewal.

4) Focus on fundraisers' initiatives and future policy

The purpose of follow-up activities is to engage in dialogue and provide support, enabling fundraisers to effectively implement their transition strategies in line with external and internal environmental changes. It should be noted that the specifics of how fundraisers will modify their strategies based on the follow-up activities (such as accompanying support or consulting) will be addressed after the follow-up activities and are not within the scope of this document.

5) Anticipated changes in the business environment

Changes in the business environment span wide range, encompassing external factors such as policy, technology, and market shifts, as well as fundraisers' internal factors like business restructuring. It is worth noting that these changes are not always negative for fundraisers; they can also include positive aspects, such as expediting initiatives outlined in their strategies. Below are the main anticipated changes in the business environment. Please note that the examples provided are illustrative, and various other scenarios can be envisioned.

Case 1: Impact of targets and political changes

Modifications to government goals can influence the implementation of strategies for fundraisers. For instance, if Japan raises its nationally determined contributions (NDC) for emission reduction, fundraisers may need to elevate their mid-term GHG emission reduction targets. Furthermore, changes in the energy mix specified in the Strategic Energy Plan would require energy companies to adjust their targets and initiatives accordingly. The energy sector, in particular, has a strong relationship with these policy goals in terms of ensuring stable energy supply.

Case 2: Impact of infrastructure development

In many industries, fuel conversion is a pivotal element in achieving a decarbonized society. Alongside technological advancements in fuel production and transportation, the establishment of supply infrastructure is essential. For example, the widespread adoption of Electric Vehicles (EVs) and hydrogen fuel cell vehicles necessitates the

installation of EV charging stations and hydrogen stations. While these developments do not solely depend on fundraisers, the progress in infrastructure can significantly affect the advancement of their strategies.

Case 3: Impact of emergence of new technologies

The emergence of innovative low-carbon technologies and solutions is expected to influence the progress of strategies and course of actions. For instance, if research investments in groundbreaking technologies aimed at achieving a decarbonized society lead to the discovery of more energy-efficient materials that become mainstream, it may require adjustments to various initiatives and plans, even if the overall targets are not significantly affected.

Case 4: Impact of demand fluctuations

The demand for products and services offered by fundraisers can fluctuate, leading to variations in their emissions unrelated to decarbonization efforts. For instance, when the products and services provided by fundraisers contribute to overall emission reductions when used, which may result in an increase in sales volume for decarbonized society which could result in an increase in Scope 1~3 emissions[15]. In the gas sector, for example, through the provision of natural gas during the transition period before innovative technologies are implemented, gas companies can make significant contributions, albeit temporarily increasing their Scope 3 emissions. In the power sector, while the overall emissions decrease with the promotion of electrification, power companies may experience temporary increases in Scope 1 emissions. Additionally, it is possible to anticipate a decrease in total emissions and an earlier achievement of targets due to unexpected production volume decrease. Furthermore, if the products and services offered by fundraisers become more expensive than the traditional market price, a decrease in demand can be expected. It is important to consider these factors as they are independent of fundraisers' reliance.

Case 5: Impact of changes in business partners and their policies

Changes in the strategies of business partners in the supply chain can necessitate adjustments to fundraisers' strategies. Particularly when fundraisers become suppliers to large corporations, the policies of these corporations become external factors that can influence fundraisers. Therefore, it is important to consider the trends of large corporations. For example, in the case of automotive component manufacturers, production plans for vehicle parts depend on the plans of the OEMs (such as a significant shift to EVs or prioritization of Fuel Cell Vehicles).

Case 6: Impact of natural disasters and other events

Unforeseen events such as natural disasters, wars, and infectious diseases can occur, resulting in significant deviations between emission reduction targets and actual performance. While these events often have transient effects, there is also a potential for long-term changes in societal dynamics, as seen in the case of the COVID-19 pandemic.

Case 7: Impact accompanying changes in fundraisers' business

Organizational and business changes resulting from M&A or business restructuring can alter priorities and necessitate a review of strategies and other aspects.

15 Scope 1 refers to the direct GHG emissions generated by a company's activities, such as fuel combustion and industrial processes. Scope 2 encompasses the indirect emissions resulting from the use of electricity, heat, or steam supplied by other companies. Scope 3 includes all other indirect emissions not covered by Scope 1 and 2, including emissions from third parties associated with a company's activities.

Afterword

This document aims to enhance the credibility of transition finance by providing fundamental concepts and key points for post-execution follow-up. Its purpose is to ensure the steady execution of transition strategies and improve corporate value. The importance of funding for sectors crucial to achieving a decarbonized society, particularly hard-to-abate sectors, has been recognized, resulting in increased funding. Consequently, follow-up activities are essential to facilitate and support the effective implementation of transition strategies after funding, contributing to the credibility of transition finance.

However, efforts in transition finance are still in early stages, requiring continuous efforts to improve effectiveness through case studies in follow-up activities. Therefore, when implementing follow-up practices, practical adjustments based on the information in this document are anticipated. For instance, Appendix 2 provides examples of bond investors conducting follow-up, but actual follow-up methods may vary depending on the relationship with fundraisers and the strategies and policies of financiers within their organizations. Collaboration with securities firms, rating agencies, and other market stakeholders can also enhance information gathering and interaction with fundraisers. Furthermore, considering the objective of this book to improve the credibility and effectiveness of transition finance, it is desirable for financiers to proactively communicate their follow-up practices externally in the future.

As fundraisers aim for decarbonization through diverse transition pathways, various approaches exist for implementing follow-up activities. It is hoped that financiers, using this document as a guide, will explore best practices of follow-up activities that contribute to executing transition strategies, enhancing corporate value, and accumulate practical examples by working closely with fundraisers.

Appendix 1: List of Key Points for Preparatory and Follow-Up Activities

Sharing understanding of the transition strategy

- Timing of Implementation: During the structuring and execution of transition finance
- Referenced Section: Chapter 2, Section 2

A. TODOs

☐ Has the fundraiser reconfirmed the scenarios, roadmaps, and underlying assumptions regarding the fundraisers' transition strategy referred to during the procurement of transition finance?

☐ Reference:

✓ Frameworks presented by fundraisers

✓ Disclosed information such as IR materials (e.g., integrated reports, environmental data books, green bond reports)

✓ Dialogue with the fundraiser (e.g., roadshows)

✓ Second Party Opinions, etc.

Expectations during follow-up activities

- Timing of Implementation: post-execution of transition finance
- Referenced Section: Chapter 2, Section 3

A. TODOs

1. Review achievements

☐ What initiatives were implemented based on the transition strategy?

☐ Are the fund seeker's GHG/CO2 emissions progressing toward emission reduction targets?

☐ (For use-of-proceeds instruments) Is the allocated funding on track for the intended projects?

☐ (For general corporate purpose instruments) Is the direction of initiatives aligned with SPTs?

☐ Are the above-mentioned points appropriately disclosed or reported?

☐ References:

✓ Sustainability reports and integrated reports (mainly covering strategies and emission performance, etc.)

✓ Reports and websites related to specific transition bonds or loans

2. Follow-up activities based on business environment changes

☐ Is the progress of the fund seeker and the business environment aligned with any of the following situations? (Multiple scenarios can be assumed.)

◇ Progress and achievements differ from what was anticipated during funding procurement.

◇ Assumptions made during funding procurement (such as referenced roadmaps) have changed.

◇ Signs of business environment changes that could impact the fund seeker's initiatives in the future.

2-1. In cases where progress and achievements differ from what was anticipated during funding process

- ☐ Has the identified factor of changes in the business environment been explained?
- ☐ If not identified/explained, have the fund seeker's perspectives and the views as financiers been shared and discussed to establish a shared understanding of the factors through follow-up sessions?

2-2. In cases where assumptions made during funding process (such as referenced roadmaps) have changed

- ☐ Is there any necessity to reassess the transition strategy due to changes in assumptions (considering technological advancements or the impact of policy changes, etc.)?
- ☐ References:
  - ✓ Various roadmaps and scenarios referenced in frameworks
  - ✓ Reports from organizations such as the IPCC
  - ✓ Government strategies and policies, etc.

2-3. In cases where there are signs of business environment changes that could impact the fund seeker's initiatives in the future

- ☐ Is there a shared understanding between the fund seeker and financiers regarding business environment changes (particularly external environmental changes) that may impact fundraisers' strategies and plans?
- ☐ Is there a shared understanding been established regarding the necessity of measurements and policies due to changes in the business environment?
- ☐ References:
  - ✓ Trends from international organizations and conferences (UN[16], COP[17], WBCSD[18], ISSB[19], TCFD[20], etc.)
  - ✓ Government policies, etc.

B. Key Points

- ☐ Is the follow-up process mindful of being a two-way communication that contributes to executing transition strategies and enhancing corporate value?
- ☐ When requesting a reassessment of disclosures, is consideration given to the difficulty of providing detailed disclosures due to competitive reasons?
- ☐ In cases where fund allocation or the achievement of SPTs has short-term impacts, do fundraisers and financiers share an understanding of the transient factors involved?
- ☐ Is it recognized that progress towards SPTs may not necessarily be linear, including the possibility of periods without progress within the first year after funding?

16 The United Nations is an international organization established in October 1945.
17 The Conference of the Parties (COP) is the international conference and this document specifically refers where parties to the United Nations Framework Convention on Climate Change (UNFCCC) gather to negotiate and discuss measures to address global warming.
18 The World Business Council for Sustainable Development (WBCSD) is an alliance of CEOs from companies dedicated to sustainable development. Their aim is to contribute to the transition towards a sustainable society.
19 The International Sustainability Standards Board (ISSB) is the committee established by the IFRS Foundation in November 2021 to develop sustainability standards.
20 The Task Force on Climate-related Financial Disclosures (TCFD) is the task force established by the Financial Stability Board in December 2015, following a request from the G20. Its purpose is to promote the disclosure of financial information related to climate change.

☐ Is it acknowledged that the purpose of the follow-up activities is not to demand decisions on specific countermeasures or promise of their execution, but rather to foster a shared understanding regarding future policies?

☐ Are both external changes, such as policy, technological, and market changes, and internal changes, such as M&A, recognized as factors influencing the business environment?

Appendix 2: Practical Guidelines of Follow-up Activities in Bond Investment

Considering that bonds often have limited opportunities for interaction with fundraisers compared to loans, the following presents anticipated practices for conducting follow-up activities for bonds. It provides examples that focus on the "who" and "how" of implementation to reduce undue costs on both fundraisers and financiers.

The following serves as a reference for bond investors in practicing follow-up activities.

Fundraiser target for the follow-up

- Follow-up activities are divided into two categories: review on use of proceeds and progress towards SPTs in individual finance cases like transition bonds, and dialogues about the plans based on the current business environment. The former is expected to be conducted annually by bond investors for all investment cases using disclosure information, while the latter may prioritize certain fundraisers.
- Prioritization may consider the following factors:
  - ◇ Level of GHG emissions of fundraisers
  - ◇ Size of the investment in the financial institution's portfolio
  - ◇ Importance in the supply chain
  - ◇ Fundraisers prioritized in financiers' engagement policies

Methods for follow-up activities

- Follow-ups involve dialogues in multiple settings. It is not necessary for all interactions to be one-on-one between fundraisers and financiers. The choice of implementation methods can be based on objectives and efficiency.
  - ◇ Letters: suitable for brief request or response, such as confirmation of disclosure.
  - ◇ ESG briefings by fundraisers with multiple participants: suitable for seeking clarification on future strategies regarding transition plans and matters concerning the entire organization.
  - ◇ Small meetings exclusively for bond investors facilitated by securities firms: suitable for seeking confirmation on specific cases such as transition bonds and when questions are expected to be relatively easier to address.
  - ◇ Individual meetings with fundraisers: suitable for when engaging in dialogue of future measurements and policies based on changes in the business environment. These sessions can be held not only for follow-up activities but also in conjunction with engagements conducted by financiers or in collaboration with equity representatives, for example.
- To make the dialogues more fruitful, it is important to engage with the relevant personnel. For instance, when discussing the financial implications of external environmental changes and their corresponding responses, it is advisable to have conversations with finance personnel. Likewise, for discussions on future strategies, engaging with management planning and investor relations (IR) personnel is envisioned.

- Moreover, it is beneficial to communicate the purpose of the dialogue and the specific topics to be addressed in advance, to ensure the involvement of the appropriate personnel.

Case study *fictional example

Using the dialogue between Investor A and Airline Company B as an example, specific points for follow-up are illustrated[21].

The overview of Investor A and Airline Company B is as follows.

Investor A

Corporate Profile	✓ Major asset manager with diverse holdings of domestic and international stocks and bonds.
Emission reduction targets	✓ Set net-zero target by 2050, including Scope 3. ✓ Striving for a 7% annual reduction.
Decarbonization efforts	✓ Identified the top 200 companies in the portfolio's emissions composition as targets for climate change engagement to support decarbonization of investees and contribute to society's decarbonization efforts.
Invest in Company B	✓ Acquired Company B's transition bonds in spring 2020. ✓ Previously owned shares of Company B, which holds a significant position in the investment portfolio. ✓ Conducted a follow-up session on transition bonds during engagement concerning human rights and overall business, based on Company B's integrated report issued in autumn 2021.

Company B

Corporate Profile	✓ Major domestic airline domestic airline operating in both full-service passenger and cargo sectors.
Emission reduction targets	✓ Targeting a 10% reduction by 2030 (compared to 2013 levels). ✓ Striving for carbon neutrality by 2050. (Annual performance results are disclosed in the integrated report and on the company's website.)
Decarbonization efforts	✓ Developed a transition strategy until 2050 in 2020. ✓ Pursuing various initiatives to achieve their goals, including the purchase of fuel-efficient equipment, weight reduced aircrafts, utilization of SAF (Sustainable Aviation Fuel[22]), and enhancements of operational efficiency. Specifically, they are updating their fleet with highly efficient aircraft in the near term and plan to fully introduce SAF after 2030, aiming for decarbonization.
Outline of bonds	✓ Use of proceeds: demonstration funding for the purchase of fuel-efficient equipment and utilization of SAF. ✓ Maturity: 10 years. ✓ Obtained an SPO for the framework and confirmed alignment with the four elements[23] of the Basic Guidelines. ✓ The allocation status of funds and the actual environmental impacts are disclosed annually in the integrated report until full allocation is completed.

21 This case study is a fictional example, and the mentioned Investor A, Company B, and the issuance of transition bonds are not relevant to any of the existing companies and transactions.

22 While current jet fuel is derived from crude oil, SAF is produced using waste cooking oil, biomass fuels, municipal waste, and waste plastics. It results in reduced CO2 emissions compared to fossil fuels.

23 lement 1: Fundraisers' Climate transition strategy and governance, Element 2: Business Model Environmental Materiality, Element 3: Climate transition strategy to be scienced-based including targets and pathways, Element 4: Implementation transparency

Outline of the follow-up session

Investor A, who bought Company B's transition bonds in spring 2020, conducted a follow-up on the bonds during their engagement with the company in autumn 2021.

The follow-up session is centered around presenting their comprehension of the emissions performance and fund allocation status as outlined in Company B's integrated report. Additionally, discussions revolved around their perspectives on the growing importance of SAF procurement. The following points highlight the topics of inquiry and dialogue during the follow-up sessions.

Category	Things for investors to review	Implementation and disclosure by the company	Contents of the follow-up session
Strategy	•Whether the company made any changes to their strategy	•No changes made	•(Confirming if there are any discrepancies in each others' understanding.)
	•Implementation of initiatives stated in the strategy, such as purchasing fuel-efficient equipment, SAF, and operational improvements.	•Utilization of the latest fuel-efficient equipment on certain domestic routes, which they disclose the relevant routes and the start dates in the integrated report.	•(Confirming if there are any discrepancies in each others' understanding.) •Dialogue regarding the intensified procurement of SAF due to changes in the external environment and discussing the need for counter measurements.
Targets	•Progress against 2030 emission targets.	•Emissions are decreasing towards the target, and the results are available in the integrated report and on the company's website. •The target year was changed from 2030 to 2033 in autumn 2020 (updated to a more ambitious target compared to the previous one).	•Communicating the importance of the 2030 target as a milestone from an investor's perspective and engaging in dialogue about target setting methods. •Request for disclosure regarding the ambition of the new target compared to the previous one.
Decarbonization Efforts (Use of Proceeds)	•whether the purchase of fuel-efficient equipment, planned within one year after fundraising, has been completed. •Actual environmental impacts resulting from the introduction of fuel-efficient equipment.	•(Confirming if there are any discrepancies in each others' understanding.)	•(Confirming if there are any discrepancies in each others' understanding.)
	•Progress on SAF demonstration.	•In line with the transition strategy, currently in coordination with SAF manufacturers for the start of demonstrations in the fiscal year 2025. •However, there is no disclosure regarding the above.	•Requesting consideration of disclosure for the implemented measures.

Regarding the allocation of funds for the use of proceeds, Investor A confirmed that Company B had completed the planned purchase of fuel-efficient equipment as scheduled, as verified through the disclosure in the integrated report, ensuring no discrepancies in their understanding.

Meanwhile, considering the escalating procurement of SAF and advancements in research and development in EU and globally, Investor A sought details from Company B about their progress in SAF procurement plans.

During the engagement, Company B explained to Investor A that they are accelerating the demonstration of SAF utilization and exploring multiple procurement sources to achieve the outlined utilization in their transition strategy. They also highlighted strategic adjustments made in their management meetings.

Furthermore, Investor A raised the topic about the change made in the target year for emissions reduction goals. As an investor, they emphasized the significance of the 2030 target as a milestone and its usefulness in understanding the company's efforts. In response, Company B explained that the target year was updated due to changes in the calculation scope and to update as the targets has been set a while ago. They clarified that the new target is even more ambitious. Both parties considered these perspectives, and later, Company B disclosed the background of the target year change and the adoption of a more ambitious target. Setting the 2030 target as a milestone was also established as a topic in their management meetings.

Key Points in this Case:

During the follow-up session, the focus was on confirming the understanding of fund allocation for the transition bonds and engaging in dialogue about the overall strategy (emissions reduction goals). Since Company B provided appropriate disclosure, the purpose of the follow-up session was to ensure shared understanding between the investor and the company. While fund allocation proceeded as planned, the crucial aspect of this follow-up was to confirm on future policies of the fundraiser considering the changing external environment, particularly the intensifying SAF procurement. Sharing the understanding of both parties on future aspects that may impact fund allocation and strategies, even if they do not currently affect Company B, is important.

Additionally, although Company B is considering expanding sources for SAF procurement, it may not be easy to disclose such considerations as they are not final decisions. Therefore, dialogue serves as a key platform to confirm the policies and other related aspects.

Regarding emissions reduction goals, the key point lies in conveying the investor's perspective to the company. By updating targets to be more ambitious, Company B demonstrates proactive efforts towards decarbonization. However, from the investor's standpoint, it is desirable to have explanations about differences from previous targets and the reasons for updates, enabling the assessment of the company's initiatives by comparing them over time or with other industry peers. Constructive dialogue sharing the investor's perspective with the company's efforts enables effective disclosure of initiatives by the company and appropriate evaluation by the investors.

Roadmap for decarbonization in aviation sector

The international goals for reducing CO2 emissions in the aviation sector include an annual improvement of combustion efficiency by 2% and ensuring no increase in total emissions since 2020. To achieve these objectives, a set of measures known as the "Basket of Measures" has been identified, which includes:

a) Introducing new technologies,

b) Improving operational practices,

c) Utilizing SAF,

d) Leveraging market mechanisms.

The Ministry of Land, Infrastructure, Transport, and Tourism has published this timetable for reference[24].

24 Civil Aviation Bureau, Ministry of Land, Infrastructure, Transport and Tourism published the document in December 2021. <in Japanese>

Appendix 3: Summary of Sector Characteristics

The following is a summary of sector characteristics[25] based on the contents of a sectoral technology roadmap that financiers should keep in mind for transition finance.

sector	Contribution and collaboration for decarbonization of other sectors	Geographical constraints	Contribution to the social stability and improvement of resilience	Contribution to circular economy	Other characteristics
Iron and Steel	•The supply of steel is essential for decarbonization, including the electrification and lightweighting of automobiles, hydrogen infrastructure, and wind power generation.	•High demand for steel structures with high functionality, such as seismic resistance, in earthquake-prone Japan. •Need for high-performance steel that contributes to energy savings in Japan with limited resource.	•Improved resilience through structural strengthening, enhanced functionality, light weighting, and increased durability of structures.	•Superiority in closed-loop recyclability of iron and steel. •Reduction of natural resource input through chemical recycling of waste plastics and supply to other industries.	•world's highest efficiency for both domestic blast furnace and electric furnace. •Contribution to global reduction through energy-saving technology transfer and dissemination to developing countries. •No technology options that contribute to decarbonization, requiring a multifaceted approach. •Strategic location in Asia, where future demand is growing.
Chemicals	•Role as a destination for CO2 utilization in other industries (e.g., manufacturing chemical products from CO2 and hydrogen).	•Environmental development for the utilization of resources such as waste plastics scattered throughout the country.	•New material and product supply through chemical recycling utilizing domestic resources, leading to reduced use of imported fossil resources and improved resilience.	•Contribution to carbon circulation through chemical recycling.	•Collaboration with downstream industries and local governments for the effective utilization of waste.
Cement	•Cooperation for recycling construction waste.	•Collaboration with gas companies for infrastructure installation, such as gas infrastructure to mountainous area factories •Importance of durable cement in earthquake-prone Japan.	•Contribution to early disaster recovery through the use of disaster debris as raw materials and fuels.	•Utilization of difficult-to-treat waste such as municipal waste incineration ash and sewage sludge as raw materials. •Manufacture of artificial limestone, which is a raw material from construction waste and CO2, for reducing the use of new limestone (under development).	•Inevitable CO2 emissions derived from raw materials during production. •Technology development and alternatives are necessary for fuel conversion by utilizing coal ash from combustion as a raw material. •Domestic factories have world-class energy-saving performance.
Pulp and Paper	•Provision of materials derived from woody resources, replacing fossil-derived chemical products (biorefinery).	•Utilization of domestically produced forest resources, which are mostly located in mountainous areas are costly resulting in use of imported cheap woods.	•Stable and cheap supply of daily necessities as paper and paper products. •Maintaining CO2 absorption sources through sustainable forest management.	•Manufacture of paper and biorefinery products from woody resources. •Utilization of renewable energy (such as black liquor) and waste derived from woody resources for about half of the fuel used.	•Since utilizes black liquor as fuel, maintaining production volumes through utilization of pulps in decreasing demands will result in lower fossil-fuel ratio.
Power	•Contribution to low-carbonization and electrification in other sectors through the provision of low- and decarbonized power which may lead to potential increase in Scope 1 and Scope 3 emissions.	•Hurdles for expanding renewable energy due to geographical characteristics. •Difficulties in international electricity interchange.	•Promotion of decarbonization in conjunction with Japan's energy policies, including the Strategic Energy Plan and national security considerations.	• —	•Need to ensure stable supply throughout the system by integrating diverse energy sources and considering the entire process from power generation to demand.
Oil	•Contribution to other sectors through the supply of decarbonized fuels.	•Contribution through the supply of hydrogen, ammonia, and synthetic fuels, considering the high barriers to expanding domestic renewable energy and implementing CO2 storage technology.	•Importance of ensuring stable supply for the future •Role as an emergency energy supply. •Decarbonization based on Strategic Energy Plan and security considerations.	•Chemical recycling of waste plastic in refining facilities.	•Not only serves a wide range of purposes as fuel and raw material but also possesses excellent storage and portability, contributing to emergency energy supply through a large-scale stockpile system.
Gas	•Contribution to the decarbonization of other industries through the supply of low-carbon fuels. •Able to utilize existing infrastructure networks and consumer-side facilities and equipment.	• —	•Consideration for stable supply. •Role as an emergency energy supply. •Decarbonization based on Strategic Energy Plan and security considerations. •Contribution of gas cogeneration system implementation to enhanced resilience and the balancing capability of renewable energy.	• —	•Synthetic fuel (e-methane) is able to supply with LNG, which allows for a gradual reduction of carbon intensity in urban gas without interruption.
Automobile	•Requires collaboration with other sectors such as iron and steel and for decarbonization, as well as the need for decarbonization of electricity consumption for emissions reduction during the usage phase.	• —	•Ensuring the production of vehicles with low emissions throughout their lifecycle is essential from the perspective of sustaining economic and social activities and maintaining international competitiveness.	• —	•Unlike typical manufacturing industries, Scope 3 emissions account for about 80% of the total emissions, highlighting the significance of influencing the usage side.

25 For a summary of globally recognized summary of sectoral characteristics, please refer to the "Industry standards" by SASB (Sustainability Accounting Standards Board) and the "Global Sector Strategies" by CA+100.

1) Iron and Steel

◇ The iron and steel sector, positioned upstream in the supply chain, plays a crucial role as a material provider for a wide range of products. It contributes to decarbonization in other industries by enabling lightweight automobile bodies and high-efficiency power generation facilities. Moreover, it supplies essential materials for a decarbonized society, such as EV motors, offshore wind power foundations, hydrogen infrastructure, and CCUS[26] infrastructure.

◇ Most CO2 emissions in this sector come from the reduction reaction of iron ore using coal in blast furnaces, making Scope 1 emissions significant. Although technologies like electric furnace processes and hydrogen-based iron ore reduction ("hydrogen reduction ironmaking") are expected to be developed to reduce CO2 emissions, viable decarbonization technologies have not yet been established. However, blast furnace-produced high-quality steel remains critical for decarbonized sectors like EVs and renewable energy components. Therefore, pursuing decarbonization through a multifaceted approach, incorporating CCUS and other methods, while advancing technological development and promoting energy-saving and high-efficiency improvements in existing facilities is important.

◇ Both the blast furnace and electric furnace methods in Japan have already achieved world-class efficiency. However, to facilitate decarbonization, it is important to steadily advance technological development for manufacturing process transformation. Additionally, it is crucial to simultaneously pursue energy-saving and high-efficiency improvements in existing facilities.

2) Chemistry

◇ The chemical sector, which supplies materials for various products supporting people's daily lives and downstream sector like automobile, electrical, and electronics, is a vital and competitive sector in Japan. It produces basic chemicals (e.g., ethylene and propylene) used as raw materials for plastic, rubber, caustic soda, industrial wastewater cleaning agents, and industrial gases. To maintain and strengthen the competitiveness of our domestic sectors while actively pursuing a transition to a carbon-neutral society is crucial.

◇ CO2 emissions in the chemical sector primarily result from the thermal decomposition of "naphtha," the crude oil-derived raw material for basic chemicals, and the electrolysis process during caustic soda production, which consumes substantial amounts of electricity and heat energy in various manufacturing processes. This industry emits approximately 60 million tons of CO2 annually, making it the second-largest emitting sector after the iron and steel sector. Additionally, there are around 16 million tons of CO2 emissions from incinerating plastic, rubber, and other products after their use. Therefore, it is necessary to focus on reducing CO2 emissions from energy sources and raw materials.

◇ As measures to address CO2 emissions from energy sources, a practical transition towards natural gas from coal and the use of biomass co-firing are pursued as immediate steps towards carbon neutrality. Subsequently, the transition to new fuels such as hydrogen, ammonia, and synthetic methane (e-methane) is sought. Reduction of process derived emission can be achieved by implementing carbon cycling through chemical

26 An abbreviation for carbon capture, utilization, and storage and refers to a carbon-negative technology that involves capturing and collecting CO_2 emitted from power plants and factories, separating it from other gases, storing it, and transforming it into new products or energy sources.

recycling, and establishing new manufacturing processes that utilize biomass for plastic production or produce plastic from CO2 and hydrogen. These measures have the potential to significantly contribute to achieving carbon neutrality.

◇ Continuing immediate measures while simultaneously pursuing innovative technology development is essential.

3) Cement

◇ The sector plays a crucial role in supplying safe and reliable materials for infrastructure, such as buildings and roads, and contributes to a circular economy by utilizing waste as fuel or raw materials. It advances decarbonization efforts while ensuring production capacity and fulfilling social responsibilities.

◇ Most CO2 emissions in the sector, accounting for 60%, result from the decarbonation process of limestone, the raw material used in cement production. In our earthquake-prone country, there is a tendency to produce a higher proportion of intermediate products (clinker) by calcining limestone to ensure strength and durability. Consequently, a significant amount of CO2 is emitted due to the high limestone content in cement.

◇ Energy-derived CO2 constitutes approximately 40% of the total emissions. In the short-term, realistic transition will be to shift towards natural gas and co-firing of woody biomass from coal and then shit to new fuels such as hydrogen, ammonia, and synthetic methane (e-methane) in the future. The use of coal as a heat source is driven by the fact that many domestic plants are located in mountainous areas near limestone mines or regions with vulnerable infrastructure, making the establishment of gas pipelines costly. To address this, a combination of approaches is required, including tailored CO2 capture and utilization technologies (CCUS) for the sector, while considering factors like strength and durability. Additionally, the introduction of innovative technologies based on CCUS is crucial.

4) Pulp and Paper

◇ The pulp and paper sector plays a crucial role in supplying essential daily necessities, such as newsprint, copy paper, publishing paper, cardboard base paper, craft paper for packaging, and hygiene products like toilet paper, tissue paper, and towel paper, providing them affordably and reliably to support people's lives. It also supplies vital materials for industrial applications, including electrical insulation paper, construction materials, and food containers, serving as a significant component of our country's sectors.

◇ This sector requires a significant amount of heat and electricity during production processes like drying. To ensure stable and competitively priced energy supply, it has utilized coal-fired in-house generations and other means to maintain and strengthen its competitiveness. However, these facilities contribute to substantial CO2 emissions.

◇ Currently, the sector actively maximizes the use of black liquor, a byproduct generated during pulp production, as biomass fuel. It also actively utilizes paper sludge, construction waste, thinning, and other waste materials as fuel. These efforts not only reduce CO2 emissions but also significantly contribute to the formation of a circular society.

To achieve carbon neutrality, it is necessary to undergo an energy transition of remaining fossil resources. Realistic transitions towards carbon neutrality include shifting from coal to natural gas, co-firing with woody biomass, and the development of technologies for carbon recycling fuels such as e-methane. Additionally, practical implementation of CO2 fixation and utilization of new fuels such as ammonia and hydrogen are

also essential.

5) Power

◇ Within Japan's domestic CO2 emissions, indirect emissions from electricity account for approximately 40%. As various manufacturing processes are expected to be electrified for decarbonizing other industries, decarbonizing the power sector plays a crucial role in achieving carbon neutrality. However, electricity is essential for people's lives and economic activities. Therefore, its decarbonization should be promoted in conjunction with the country's energy policy, prioritizing safety, stable supply, and economic efficiency.

◇ Currently, fossil fuels constitute about 80% of the power source composition. Thus, accelerating the decarbonization of power sources while ensuring stability is vital. Japan, lacking fossil resources and heavily dependent on energy imports, faces challenges such as limited flat land and difficulties in expanding renewable energy under harsh natural conditions. Moreover, being surrounded by the sea and lacking international interconnections for power import and export sets it apart from other countries, resulting in vulnerabilities in energy supply. Considering these unique circumstances, pursuing realistic and tailored decarbonization efforts is crucial for effectively addressing climate change.

◇ To advance decarbonization under these premises, integrating diverse power sources is necessary to ensure a stable supply throughout the system. Additionally, a comprehensive and flexible power system, encompassing generation and demand, is required for effective integration.

6) Gas

◇ Approximately 60% of energy consumed in our country's industrial and residential sectors is dedicated to heating, which is crucial for people's lives. Gas plays a fundamental role as a provider of thermal energy, meeting diverse heating needs in these sectors.

◇ Among fossil fuels, LNG[27], used for electricity and city gas, has the lowest CO2 emissions. Therefore, effective measures to decarbonize heating demand involve shifting from coal and oil to natural gas on the demand side. Moreover, LP gas, renowned for its portability and durability, serves as a vital emergency energy source during disasters. It remains an essential field in a decarbonized society, ensuring resilience. The gas sector holds a significant position in terms of social infrastructure, necessitating decarbonization efforts integrated with energy policy.

◇ Considering the entire lifecycle of city gas, a considerable amount of GHG is emitted during combustion. Reducing emissions during gas production and promoting the transition to decarbonized gases are pivotal in curbing emissions during combustion.

◇ Achieving net-zero in the gas sector requires funding for the development and implementation of advanced thermal energy technologies such as synthetic methane (e-methane), synthetic LP gas, and hydrogen. Fuel conversion and energy-efficient equipment upgrades are also vital. E-methane and synthetic LP gas derived from renewable or captured CO2 sources are valuable for CCU[28]. Leveraging existing supply chains of LNG and natural gas, they minimize facility costs while achieving decarbonization.

27 An abbreviation for liquefied natural gas. It is produced by cooling natural gas to a temperature of minus 162 degrees Celsius, causing it to liquefy.
28 An abbreviation for the carbon capture and utilization. It involves collecting CO2 emitted from power plants, chemical industries, and other sources by separating it from other gases, and using it in the production of new products.

7) Oil

◇ Oil serves as fuel for transportation, residential use, power generation, and various material applications, including chemicals. It is an essential industry that accounts for around 50% of final energy consumption. Ensuring a stable supply is crucial as it is also utilized as emergency energy during disasters. Considering these characteristics, pursuing decarbonization while addressing the need for a continuous and stable supply is essential.

◇ In the oil sector, about 93% of emissions originate from Scope 3 emissions associated with product combustion, followed by approximately 4% from Scope 1 emissions related to heat utilization and in-house generation during petroleum refining. Achieving net-zero in the oil sector requires steady progress in the low-carbonization and decarbonization of refining processes to maintain a stable supply. This involves transitioning to a supply system of decarbonized fuels like hydrogen, ammonia, biofuels, and synthetic fuels, as well as adopting decarbonization technologies like CCS[29] and CCU, considering all available options.

◇ Continued improvements in energy efficiency and fuel conversion at refineries, along with establishing supply chains for hydrogen, ammonia, and SAF, and developing manufacturing technologies for synthetic fuels, necessitate collaboration and coordination among various stakeholders to promote expanded utilization on the demand side.

8) Automobile

◇ The automotive sector is vital, accounting for about 10% of employment and 20% of exports. However, it is a hard-to-abate sector, contributing to approximately 16% of domestic CO2 emissions when considering Scope 3 emissions. To maintain international competitiveness, transitioning to net-zero is crucial.

◇ Emissions in the automotive sector mainly occur during manufacturing process, energy source production and supply, and vehicle usage, divided into three categories. Scope 3 emissions represent about 80% of the total, emphasizing the need for measures addressing both supply-side actions and changes in user demand.

◇ Concrete supply-side initiatives include reducing emissions during manufacturing through the development of high-performance batteries and energy-saving measures. Decreasing energy source production and supply involves a wide range of options, including carbon-neutral fuels that help decarbonize existing vehicles.

◇ Furthermore, in the automotive sector with significant Scope 3 emissions, it is essential to focus on emission reductions during vehicle usage by promoting and widely adopting electric vehicles. Considering the diverse use cases depending on the vehicle type, pursuing various options without limiting to specific technologies is important. This approach utilizes Japan's strengths and industrial foundation while fostering innovation and competition among different technologies.

29 An abbreviation for the carbon capture and storage. It involves capturing CO2 before it is released into the atmosphere, either by capturing it from industrial processes or directly from the atmosphere and storing it or using it as a valuable resource.

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Chair

Kunio Ito

Director of Hitotsubashi CFO Education and Research Center

Members

Keigo Akimoto

Group Leader/Chief Researcher, Systems Analysis Group, Research Institute of Innovative Technology for the Earth

Sachie Ii

Sustainability Chief Strategist, Sustainable Business Promotion Department, Mizuho Financial Group, Inc.

Takahiro Ueno

Senior Researcher, Socio economic Research Center,

Central Research Institute of Electric Power Industry ISO/TC 322 Expert

Shunsuke Oshida

Managing Director, Head of Credit Research, Japan, Manulife Investment Management (Japan) Limited

Kenjiro Okazaki

General Manager, Responsible Investment Dept, The Dai-ichi Life Insurance Company, Ltd.

Atsuko Kajiwara

Executive Officer, Head of Sustainable Finance Evaluation Department, Japan Credit

Rating Agency, Ltd.

Tadahiro Kaneko

General Manager, Sustainable Business Promotion Dept., Planning Dept., Wholesale Banking Unit,

SUMITOMO MITSUI BANKING CORPORATION

Masato Kanedome

Principal, Sustainability Service Group. DNV Business Assurance Japan K.K.

Kazuyuki Kitajima

Head of CORE Investments Japan, AXA Investment Managers Japan Ltd.

Yasutoshi Miyamoto

General Manager, ESG Investment Strategy Office. Nippon Life Insurance Company

Toshinori Kurisu has served as a member for FY 2022

Yukari Takamura

Professor, Institute for Future Initiatives, The University of Tokyo

Keisuke Takegahara

Executive Fellow/General Manager, Research Institute of Capital Formation and

Head of Research Center on Financial Economics, Development Bank of Japan Inc.

Kensuke Nishiji

Managing Director, Deputy Head of Sustainable Business Division, MUFG Bank, Ltd

Masami Hasegawa

Director, Environment & Energy Policy Bureau, Keidanren(Japan Business Federation)

Reiko Hayashi

Director and Deputy President, BofA Securities Japan Co., Ltd.,

Board Member, International Capital Markets Association (ICMA)

Expert Members

Takatoshi Seiki

Manager, Accounting Department Finance Group, Tokyo Gas Co., Ltd.,

Observer

The Life Insurance Association of Japan

Japanese Bankers Association

JAPAN INVESTMENT ADVISERS ASSOCIATION

JAPAN EXCHANGE GROUP

United Nations Environment Programme Finance Initiative

Principles for Responsible Investment

Japan Securities Dealers Association

Ministry of Land, Infrastructure Transport and Tourism