環境省
Ministry of the Environment

Green Bond Guidelines 2020

2020

Foreword for the Green Bond Guidelines 2020 and Green Loan and Sustainability Linked Loan Guidelines 2020

Approximately three years has passed since the publication of the "Green Bond Guidelines 2017" in 2017, and the total amount of issuance in Japan's green bond market has greatly expanded since its inception, to approximately 820 billion yen in 2019.

In the meantime, however, the environmental problems surrounding us are becoming increasingly serious. In Japan, flooding and landslides have been of frequent occurrences due to heavy rains and other events in various parts of the country, causing significant damage. There are concerns over the increasing frequency and extremity of water-related disasters caused by increased rainfall and rising sea levels due to climate change. Severe marine pollution from plastic waste has also become apparent. Australia is experiencing large-scale and severe forest fires due to climate change. The top five global risks identified in the Global Risk Report 2020 prepared by the Global Economic Forum that are likely to occur in the next decade were all environmental issues; extreme weather, failure of climate change mitigation and adaptation, large-scale natural disasters, large-scale biodiversity loss and ecosystem collapse, and human-made environmental disasters.

The global situation surrounding sustainable finance is undergoing major changes amid the materialization of risks and increased awareness of crises associated with climate change and planetary boundaries. Beyond increasing global ESG investments and issuance of green bonds, there has been an accelerating trend toward climate-related financial disclosures since the delivery of the final recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). In addition, the Network for Greening the Financial System (NGFS) has begun to work on the climate change risks, and interest in climate change is increasing among central banks and supervisors. In the EU, policy implementation is progressing based on the Action Plan on Sustainable Finance, including the development of an EU Green Bond Standard and an EU Taxonomy. Developments surrounding transition finance have also begun. In addition, Positive Impact Finance, which generates environmental and social impacts, is being promoted for the creation of a sustainable society and economy.

Amid the progress of these various measures, attention is increasing on green bonds as green bonds can have a clear impact on the environment by supporting companies that are making reliable green investment proposals. In the Sustainable and Responsible Investment Guide for Central Bank’s Portfolio Management (released by NGFS in October 2019), green bond investment was cited as the most well-known responsible investment strategy by central banks. The Bank for International Settlements (BIS) launched the Green Bond Initiative and established the Green Bond Fund for central banks in September 2019. ICMA has also revised its Green Bond Principles as appropriate and published a supplementary Guidance Handbook.

The publication of the Green Loan Principles in 2018 has also raised interest in Green Loans. Green Loans are loans for financing projects with environmental benefits, and by aligning the basic framework with green bonds, it is expected that seamless financing for green projects will become active. Furthermore, the Sustainability Linked Loan Principles were released in 2019, increasing the number of cases of Sustainability Linked Loans. Considering that the ratio of indirect financing is high in Japan and that it is financial institutions that are working directly with and providing funds to local SMEs, Green Loans and Sustainability Linked Loans have a major role to play in creating a sustainable society that has realized the SDGs.

These Guidelines have been revised and developed in light of these developments, including the revision of the Green Bond Principles (GBP) and the publication of the Guidance Handbook. In this revision and development, consistency with the Green Bond Principles, Green Loan Principles, and Sustainability Linked Loan Principles have been taken into consideration, and content is in line with

international trends. In addition, the concept of sustainability bonds have been explained, and examples based on issuance cases in Japan have been enhanced.

As noted above, the crisis associated with climate change and planetary boundaries require immediate action. For the transition to a decarbonized society and the realization of a sustainable society that embodies the SDGs, it is absolutely necessary for market participants, including issuers and borrowers, investors and financial institutions, intermediaries, and service providers, to mainstream the consideration of ESG factors. We strongly hope Japan will make further progress in ESG finance initiatives in all asset classes, not limited to Green Bonds, Green Loans, or Sustainability Linked Loans, and that Japan will truly become a big power in ESG finance.

Foreword for the Green Bond Guidelines 2017

Currently, the world faces a variety of environmental issues that can threaten the survival of the human species and the sustainability of economic activities. According to the fifth *Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC) published from 2013 to 2014, there is no doubt about global warming, and extensive, serious risks are expected to affect human society from the temperature rise with the concomitant negative impact on the availability of food and water and extreme weather events. All human activities are based on the favorable global environment, and economic activities, including finance, are no exception. On the other hand, the economic activities have risks such as CO2 emissions that could damage the favorable global environment. In light of these conditions, the Paris Agreement, the first legally binding consensus on climate change in 18 years since the Kyoto Protocol, was adopted at COP 21 on December 12, 2015, in Paris, France. The Paris Agreement brought all nations into common cause for the first time as an international agreement to undertake ambitious efforts to combat climate change by setting the targets of holding the increase in the global average temperature to well below 2°C above pre-industrial levels, pursuing efforts to limit the temperature increase to 1.5°C above preindustrial levels, and making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development, etc.

Since the favorable global environment connotes limited resources, we must not exhaust them only by the current generation. Our responsibility is to pass on the favorable global environment on which prosperity equal to current levels can be built to future generations. The 2°C target of the Paris Agreement embodies our efforts to fulfill this responsibility.

However, the achievement of the 2°C target requires substantial capital. According to estimates by the International Energy Agency (IEA), an additional investment of US$9 trillion is required from 2016 to 2050 to decarbonize the power sector as part of the effort to achieve the 2°C target. Moreover, in order to achieve the energy efficiency targets in the building, manufacturing, and transportation sectors during the period from 2016 to 2050, an additional investment of US$3 trillion is required. Financing all those investment needs with public funds is not realistic, however. A more efficient way of securing capital is to draw on market dynamics and introducing private funds is essential. Therefore, charting a pathway for domestic and overseas private funds, including Japan's household financial assets of over 1,700 trillion yen, is critical for such investment opportunities.

As finance, the lifeblood of the economy, has great influence over the direction of the economy and society, the basic responsibility of the financial market participants is to contribute to the maintenance of the favorable global environment by creating such financial flows. Furthermore, the funds in the financial market are directly or indirectly entrusted to market participants from a variety of citizens originally. Therefore, the essential role of fiduciaries is not only executing their legal fiduciary duty but also using the funds for the creation of a safe and secure future society for the citizens. Moreover, in the situation where finite nature of the global environment have become a realistic issue, protecting the favorable global

environment means to protect the foundation of economic activities, which has medium and long-term implications on the survival of finance itself. Along with global decarbonization efforts, the technologies, products, and services required for decarbonization are to be considered to create variety of business opportunities. Therefore, accommodating investment demand in the markets that appear to grow is important for the financial market participants.

Green Bonds are bonds where the proceeds are invested exclusively in projects that offer environmental benefits (Green Projects). The bonds explicitly create a flow of funds toward Green Projects by combining the efforts of issuers and investors and are expected to become one of the pathways where financial market participants can fulfill their basic responsibilities for the maintenance of the favorable global environment, while at the same time pursuing investment opportunities. In fact, after the publication of the Green Bond Principles (GBP) in 2014, Green Bond issuances and investments have increased significantly overseas. While paying our highest respect to people who have developed and supported the Green Bond market, it is expected that the variety of the financial market participants to continue actively promoting the issuance and investment in Green Bonds in the future.

In addition, Green Bonds may help to attract people who have not been interested in investments in conventional bonds. For example, if a local government or a local company issues a Green Bond for Green Projects in the local community, it may create a new flow of funds that circulate within the community. Investing local funds in projects to conserve the natural environment of the community will contribute to regional revitalization through creating employment in renewable energy projects, regional activation by the maintenance and development of tourism and the creation of disaster-resistant communities.

We made this Green Bond Guidelines aiming to raise the visibility of Green Bonds and expand Green Bond issuance and investment within Japan in line with the global development of the Green Bond market. When developing the Guidelines, we considered the consistency with Green Bond Principles, which is widely accepted in the world.by issuing and investing in Green Bonds by broad market participants under this Guidelines, it is expected that private funds will be appropriately invested in the projects that contribute to the conservation of the global environment. We sincerely hope that such efforts will ensure that environmental consideration will be embedded in every decision-making process not only related to bonds but also to all finance activities so that a sustainable society will be achieved through market mechanisms.

Background to the Development of the Guidelines

From October 2016 to March 2017, the Green Bond Review Committee (hereinafter referred to as the "Review Committee") met four times, where scholars and practitioner in Green Bonds discussed the details of the Guidelines based on the following three basic approaches:

(i) Due consideration should be given to consistency with Green Bond Principles, which is widely accepted in the world;

(ii) The Guidelines should reflect the immature market situation in Japan, where Green Bond issuance and investment have not been actively implemented (including lowering costs and the clerical load);

(iii) In an effort to ensure the safety of investments in Green Bonds by domestic and overseas investors, The Guidelines should prevent “green-wash” bonds (bonds labelled as “green” despite the fact that they have no environmental benefits, or that their proceeds have not been appropriately allocated to Green Projects) from being issued and invested in.

In December 2016, a Green Bond opinion exchange meeting was held with Review Committee members and European and American financial market participants well-versed in the Green Bond Principles to exchange views on the Guidelines. In February 2017, a Third-Party Committee on Green Bond Guidelines (provisional name) met to allow an examination of the Guidelines by independent third parties who had no direct stake in the Guidelines. From Thursday, January 26 to Tuesday, February 14, 2017, public comments regarding the Guidelines were invited, which were later reviewed and discussed (as appropriate) by the Review Commission. Based on these discussions, the Guidelines were developed by the Ministry of the Environment of Japan.

Revision of Green Bond Guidelines 2020 and Formulation of Green Loan and Sustainability Linked Loan Guidelines 2020

The "Review Committee on Green Bonds" (hereinafter referred to as the "Second Review Committee") was held three times between July 2019 and February 2020. Academics and practitioners related to Green Bonds discussed the content of the Guidelines among other related matters while taking into account three basic concepts adopted at the First Review Committee.

In August 2019, a Green Bond Dialogue was held to exchange views on the content of the Guidelines and other related issues between the members of the Review Committee and market participants with expertise on the Green Bond Principles, the Green Loan Principles, and the Sustainability Linked Loan Principles.

Public comments were accepted between Thursday, December 12, 2019, and Friday, January 10, 2020, and called for a wide range of opinions on the content of the Guidelines. In addition, opinions were also sought from relevant overseas organizations regarding the contents of these guidelines. These opinions were reviewed at the Review Committee and were reflected in the discussions of the Review Board as appropriate.

Based on these discussions, the Guidelines were developed by the Ministry of the Environment of Japan.

List of Members of the Review Committee on Green Bonds / Green Loans, etc. in 2019

Chairperson	Takeshi Mizuguchi	Professor, Faculty of Economics, Takasaki University of Economics
Committee member	Kazuyuki Aihara	Senior Officer, Head of ESG products, Debt Capital Market Department, Nomura Securities Co., Ltd.
Committee member	Naoki Adachi	Representative Director of Response Ability Co., Ltd.
Committee member	Shinichiro Arie	Director, Head of Fixed Income Department, Investment Management Division, Amundi Japan Ltd.
Committee member	Yoshiyuki Arima	Representative of Japan, Finance Bureau of the World Bank
Committee member	Kosuke Ito	Director, Division of Financing,Treasury Department, Development Bank of Japan Inc.
Committee member	Takashi Uni	Deputy General Manager, Credit Investment Department, Nippon Life Insurance Company
Committee member	Hiroshi Kawakami	Joint General Manager, Syndicated Finance Structuring Department No.1, Mizuho Bank, Ltd.
Committee member	Kenji Kawamura	Professor of Commercial Law, Rikkyo Law School
Committee member	Ryo Saeki	Director, Bond Section, Budget Division, Bureau of Finance, Tokyo Metropolitan Government
Committee member	Yoshio Shima	Professor, Faculty of Business Administration, Tamagawa University
Committee member	Kazushi Shimizu	Executive Director, Department of Debt Capital Markets, Daiwa Securities Co., Ltd.
Committee member	Rin Shimizu	Vice President, Growth Industry Cluster Department, Sumitomo Mitsui Banking Corporation
Committee member	Masato Takebayashi	Associate Director, Asia Pacific Research, Sustainalytics
Committee member	Ryosuke Tamura	Executive Director, Debt Capital Markets Division, Investment Banking Business Unit, Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.
Committee member	Mana Nakazora	Deputy Chairman, Global Market Management Division, BNP Paribas Securities Co., Ltd.
Committee member	Amane Yamazaki	Office Manager, Sustainable Business Office, MUFG Bank, Ltd., Responsible for Environmental and Social Risk Management

Observer	Japanese Bankers Association
Observer	The Japanese Institute of Certified Public Accountants
Observer	Japan Securities Dealers Association
Secretariat	Environment and Economy Division, Minister's Secretariat, the Ministry of the Environment
	Institute for Global Environmental Strategies

List of Participants in Opinion Exchange Meetings on Green Bonds, Green Loans, etc.

[Banking Sector]

<Attendees>

Kosuke Ito	Director, Division of Financing,Treasury Department, Development Bank of Japan Inc.
Hiroshi Kawakami	Joint General Manager, Syndicated Finance Structuring Department No.1, Mizuho Bank, Ltd.
Rin Shimizu	Vice President, Growth Industry Cluster Department, Sumitomo Mitsui Banking Corporation
Takeshi Mizuguchi	Professor, Faculty of Economics, Takasaki University of Economics
Amane Yamazaki	Sustainable Business Office, MUFG Bank, Ltd., Responsible for Environmental and Social Risk Management

<Observer>

Japanese Bankers Association

List of Participants in Opinion Exchange Meetings on Green Bonds, Green Loans, etc.

[Securities Sector]

<Attendees>

Kazuyuki Aihara	Senior Officer, Head of ESG products, Debt Capital Market Department, Nomura Securities Co., Ltd.
Sachie Ii	Head of Sustainable Finance Office, Corporate Finance Department, Mizuho Securities Co., Ltd.
Yuki Ukegawa	Vice President, Debt Capital Markets, JP Morgan Securities Co., Ltd.
Koji Ohmachi	Managing Director, Capital Markets Origination, Citigroup Global Markets Japan Inc.
Masataka Sampei	Managing Director, Deputy Head of Capital Markets, SDGs Finance, SMBC Nikko Securities Inc.
Yoshio Shima	Professor, Faculty of Business Administration, Tamagawa University
Kazushi Shimizu	Executive Director, Department of Debt Capital Markets, Daiwa Securities Co., Ltd.
Masanori Suzuki	Manager of Debt Capital Markets Group, Capital Markets Department, Tokai Tokyo Securities Co., Ltd.
Ryosuke Tamura	Executive Director, Debt Capital Markets Division, Investment Banking Business Unit, Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.
Mana Nakazora	Deputy Chairman, Global Market Management Division, BNP Paribas Securities Co., Ltd.
Munetada Nakayama	Senior Manager, Syndication Department, SBI SECURITIES Co., Ltd.
Reiko Hayashi	Director of the Board, Deputy President, Managing Director, Merrill Lynch Japan Securities Co., Ltd.

Takeshi Mizuguchi	Professor, Faculty of Economics, Takasaki University of Economics

<Observer>

Japan Securities
Dealers Association

List of Participants in Opinion Exchange Meetings on Green Bonds, Green Loans, etc.

[Consulting & External Review Sector]

<Attendees>

Akira Ishiwata	Head of Credit Rating Planning and Research Office and Chief Analyst, ESG Promotion Department, Rating and Investment Information, Inc.
Atsuko Kajiwara	General Manager, Head Chief Sustainable Finance Analyst, Sustainable Finance Evaluation Department, Japan Credit Rating Agency, Ltd.
Masato Kanedome	Technical Assessor, Engineering Department, DNV GL Business Assurance Japan K. K.
Yoshio Shima	Professor, Faculty of Business Administration, Tamagawa University
Naoko Hase	Manager, ESG Research Center, Center for the Strategy of Emergence, Japan Research Institute, Co., Ltd.
Masato Takebayashi	Associate Director, Asia Pacific Research, Sustainalytics
Takeshi Mizuguchi	Professor, Faculty of Economics, Takasaki University of Economics

<Observer>
The Japanese Institute of Certified Public Accountants

Green Bond Review Committee
List of Names

<Chairman>

Takeshi Mizuguchi, Professor, Faculty of Economics, Takasaki City University of Economics

<Committee Member>

Naoki Adachi, President, Response Ability, Inc.

Kazuhiko Abe, Executive Officer, PwC Sustainability LLC

Toru Inoue, General Manager of the Investment Banking, Capital Market, and Infrastructure and Structured Finance Departments, Goldman Sachs Japan Co., Ltd.

Daisuke Kawaguchi, Section Chief, Credit Investment Department, Nippon Life Insurance Company

Yoshio Shima, Professor, College of Business Administration, Tamagawa Academy and University

Masayasu Sugawara, Public Bond Section Chief, Accounting Division, Bureau of Finance, Tokyo Metropolitan Government

Ko Teramoto, General Manager, Planning Department, Office REIT Division, Kenedix Real Estate Fund Management, INC.

Ken Tokuda, Senior Deputy Section Chief, Overseas Origination Section and Second Origination Section, Debt Capital Market Department, Daiwa Securities Co., Ltd.

Mototsugu Matsuoka, Assistant Manager and Treasury Section Chief, Treasury Department, Development Bank of Japan Inc.

<Observer>

Keiko Kishigami, Executive Director, Japanese Institute of Certified Public Accountants

Masato Maruno, General Manager, Public Bonds and Financial Products Department, and Market Statistics Office Chief, Self-regulation Board, Japan Securities Dealers Association

<**Secretariat**>

Environment and Economy Division, Environmental Policy Bureau, Ministry of the Environment

Green Bond Opinion Exchange Meeting
List of the names of participants

<**Market Participants**>

Dai Kitatani	Vice President, Capital Market Department, Citigroup Global Markets Japan Inc.
Hiroshi Aoki	General Manager, Capital Market Department, Tokyo Branch, Credit Agricole Securities Asia BV
Masanori Kato	Managing Director and General Manager, Bond and Capital Market Department, JP Morgan Securities Japan, Co., Ltd.
Yuki Ukegawa	Associate, Bond and Capital Market Department, JP Morgan Securities Japan, Co., Ltd.
Reiko Hayashi	Executive Officer, Managing Director, and General Manager, Bond and Capital Market Department, Merrill Lynch Japan Securities
Ryota Suzuki	Managing Director and General Manager, Bond and Capital Market Department, Capital Market Division, Merrill Lynch Japan Securities

<**Green Bond Review Committee Members**>

Kazuhiko Abe	Executive Officer, PwC Sustainability LLC
Toru Inoue	General Manager of the Investment Banking, Capital Market, and Infrastructure and Structured Finance Departments, Goldman Sachs Japan Co., Ltd.

Daisuke Kawaguchi Section Chief, Credit Investment Department, Nippon Life Insurance Company

Yoshio Shima	Professor, College of Business Administration, Tamagawa Academy and University
Ken Tokuda	Senior Deputy Section Chief, Overseas Origination Section and Second Origination Section, Debt Capital Market Department, Daiwa Securities Co., Ltd. (Attendance by proxy: Yuma Morisawa, Assistant Section Chief, Overseas Origination Section, Debt Capital Market Department)

Mototsugu Matsuoka	Assistant Manager and Treasury Section Chief, Treasury Department, Development Bank of Japan Inc.
Takeshi Mizuguchi	Professor, Faculty of Economics, Takasaki City University of Economics

<Observers>

Keiko Kishigami	Executive Director, The Japanese Institute of Certified Public Accountants
Masato Maruno	General Manager, Public Bonds and Financial Products Department, and Market Statistics Office Chief, Self-regulation Board, Japan Securities Dealers Association

Third-Party Committee on Green Bond Guidelines

<Committee Member>

Toshihiko Goto	Supreme Advisor, Japan Sustainable Investment Forum Representative Trustee, Sustainability Forum Japan
Takejiro Sueyoshi	Special Advisor, UNEP Finance Initiative
Itaru Yasui	Professor Emeritus at the University of Tokyo President, Institute of Promoting Sustainable Societies

<Observer>

Takeshi Mizuguchi	Professor, Faculty of Economics, Takasaki City University of Economics

<Secretariat>

Environment and Economy Division, Environmental Policy Bureau, Ministry of the Environment

Green Bond Guidelines 2020

Ministry of the Environment

Disclaimer

The Green Bond Guidelines (hereinafter “the Guidelines”) are legally non-binding and no legal penalties will be imposed even if a certain action does not comply with the elements (including elements described with the word “should”) described in the Guidelines. However, it is necessary to note that if a certain action infringes upon any laws or regulations, legal penalties may be imposed based on these laws or regulations, even though the action complies with the elements described in the Guidelines.

The Guidelines do not constitute advice on decisions regarding investments in individuals, other securities, or financial matters, or recommendations to purchase, sell, or hold specific Green Bonds or other securities.

The Guidelines do not guarantee that the projects to which proceeds from specific Green Bonds are allocated will produce the intended environmental benefits, and assume no responsibility whether the projects realize their environmental benefits or not.

People who issue, purchase, sell, or hold specific Green Bonds or other securities shall do so at their own risk.

The Ministry of the Environment of Japan will not be liable in any way for any loss, damage, or expense of any kind incurred as a result of or in connection with the use of the information presented in the Guidelines, including any modifications or abolition of the Guidelines.

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Chapter 1 Introduction

1. Purpose of the Guidelines

In December 2015, the Paris Agreement, an international agreement regarding climate change, was adopted at the COP 21[1] held in Paris, France. In this agreement, global long-term targets were set to maintain any increase in the global average temperature to well below 2°C and to pursue efforts to limit the global average temperature to 1.5°C above pre-industrial levels. According to 'The Special Report: Global Warming of 1.5°C' adopted at the IPCC[2] Session in October 2018, human activity derived CO2 emissions must reach net zero by around 2050 to limit global warming to 1.5°C. To address the long-term substantial reduction in greenhouse gas emissions in Japan and to achieve this 2°C target, it is necessary to mobilize large amounts of private investments towards Green Projects such as renewable energy projects.

Furthermore, the "2030 Agenda for Sustainable Development" adopted at the United Nations Sustainable Development Summit held in September 2015 in New York, sets out the Sustainable Development Goals (SDGs), which include the conservation of oceanic and terrestrial ecosystems. This has led to increased expectations for the role of private investments in projects that prevent the deterioration of natural resources and support other environmental causes.

In addition, IPBES[3] published a global assessment report on biodiversity and ecosystem services in May 2019 and the Biodiversity Charter adopted at the G7 Biarritz Summit held in August 2019 in France resolved to make efforts to mobilize public and private funds towards the conservation and sustainable use of biodiversity.

Moreover, the Osaka Blue Ocean Vision was shared at the G20 Osaka Summit in June 2019 in Osaka, Japan, as the world's universal vision. While recognizing the important role plastics play in society, the Vision aims to eliminate any additional contamination of the ocean with plastic waste by 2050 through a comprehensive lifecycle approach including the reduction of the outflow of mismanaged plastic waste, based on improved waste management and innovative solutions. The importance of private funds is growing in these initiatives as well.

In recent years, the issuance of Green Bonds, bonds issued by organizations including corporations and local governments to raise funds for Green Projects[4], and investments in these bonds have significantly increased at an international level. Green Bonds are becoming an effective tool to raise funds for Green Projects, such as which contribute to the reduction of greenhouse gas (GHG) emissions and the prevention of natural capital deterioration. This trend became noticeable after the establishment of the Green Bond Principles (GBP) with the support of the International Capital Market Association (ICMA) in January 2014. Green Bond issuances and investments started to be seen in Japan as well. The spread of Green Bonds in Japan, however, is underrepresented in comparison with other countries and also given the needs to introduce large amounts of private funds to achieve the afore-mentioned international goals.

In light of the above, these "Green Bond Guidelines" (hereinafter "the Guidelines") have been developed to increase Green Bond issuances and investments in Japan. To maintain the credibility of the green characteristics of Green Bonds, the Guidelines seek to prevent "green washed" bonds (bonds labeled as "green" despite having no environmental benefits or whose proceeds[5] have not been appropriately allocated to Green Projects) from being issued and invested in.

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[1]The 21st Conference of the Parties to the United Nations Framework Convention on Climate Change
[2] Intergovernmental Panel on Climate Change
[3] Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
[4]"Green Bonds" not only includes bonds but also securitized bonds described on page 13 in this Guidelines
[5]"Proceeds" in the Guidelines means the "net proceeds" after issuance fees have been deducted.

The Guidelines, in accordance with the GBP, which are widely accepted in international Green Bond markets, seek to provide issuers, investors, and other market participants with illustrative examples of specific approaches and interpretations tailored to Japan's bond market to aid with decision-making regarding Green Bonds. The Guidelines will both establish the credibility of the green characteristics of Green Bonds and alleviate the costs and administrative burdens for issuers, thereby spurring Green Bond issuances and investments in Japan.

2. Basic Concepts of the Guidelines

The Green Bond market is to be developed through interactions based on sufficient information between issuers who want to raise funds, clearly declaring that they will allocate the proceeds only to Green Projects, and investors who want to invest in Green Projects of their choice. The final decision on how to evaluate the appropriateness of the issuers' approaches to Green Bonds and whether Green Bonds are invested in, would be left to the market participants.

If the expected elements of Green Bonds are clarified in the Guidelines, it will form the foundation for interactions between the issuers and investors as well as the tool for assuring stakeholders that the Green Bond proceeds will be used for Green Projects.

Additionally, it is important for issuers and investors that the credibility of the green characteristics of Green Bonds is maintained within the market and society. In particular, preventing green washed bonds from being issued and invested in is imperative for the protection of Green Bond investors.

Based on the above, the Guidelines have been developed according to the internationally accepted GBP (as of June 2018). The Guidelines recognize that a Green Bond should be aligned with four components: (1) Use of proceeds, (2) Process for Project Evaluation and Selection, (3) Management of Proceeds, and (4) Reporting, so that those bonds displaying all elements described above may be internationally accepted as Green Bonds.[6]

Issuers, investors, and other market participants may have different perspectives regarding certain matters; hence, it is important to establish a mechanism in which issuers disclose information relevant to their Green Bonds in an easily understandable way. investors or other market participants will consequently evaluate the appropriateness of the issuers' approaches to Green Bonds using the information disclosed by the issuers, and all participants, including the issuers and the investors, can take advantage of the knowledge accumulated through these interactions between participants, rather than filter out specific Green Bond approaches from the market, unless these approaches are obviously inappropriate. By establishing this mechanism, market discipline can be exercised to avoid greenwashing while securing the diversity of issuers' approaches.

It should be noted that international efforts are being made to classify environmentally sustainable economic activities in order to specify the eligible recipients of investments and loans in sustainable finance[7]. This classification could function as an additional reference document regarding issuers who, for instance, wish to issue bonds in a bond market in the region that takes part in such efforts and will help investors identify eligible Green Projects.

Progress in these international efforts must be closely monitored also from the perspective of how Green Bond proceeds should be used in Japan.

[6]However, it is necessary to keep in mind that an individual Green Bond is to be evaluated and selected by each investors and other related participants based on their own ways of thinking.

[7]The EU has developed sustainable taxonomy to clarify economic activities that are environmentally sustainable. [Possible to include link https://ec.europa.eu/info/publications/sustainable-finance-teg-taxonomy_en]

Meanwhile, a range of initiatives, other than Green Bonds, have been introduced in the bond market in recent years to facilitate a shift to a decarbonized society.

For instance, *sustainability linked bonds* have been issued following the same structure as *sustainability linked loans*[8] that encourage the achievement of ambitious sustainability performance targets in an effort to upgrade companies' sustainability management.

In addition, the concept of *transition bonds* have been proposed and the market has seen a number of issuances. Though international debate is still ongoing, the current thinking proposed by investors define transition bonds as bonds where proceeds are used for eligible climate-related transition projects (transition projects) to reduce greenhouse gas emissions of their business activities and or products/services.[9] Transition bonds can be issued by entities which conduct business in emissions-intensive industries and do not have eligible green projects and are therefore currently unable to issue green bonds, but have stated their objective of transitioning into a green company.

These initiatives, taking into consideration its long term impact on the environment, and if the short and long term environmental objectives are in alignment with internationally agreed goal of maintaining global warming to well below 2°C, are also expected to contribute to the transition into a decarbonized society. Developments regarding international initiatives will be monitored closely, and further consideration for the clarification of frameworks may be undertaken if necessary and in cooperation with relevant ministries and agencies.

The Guidelines herein focus on the green characteristics of Green Bonds (including the green characteristics of sustainability bonds which include green projects in its use of proceeds) and therefore do not cover their characteristics and risks as bonds. It is important to note that Green Bonds, even if aligned with the Guidelines, have credit risks, price fluctuation risks, liquidity risks, and other risks, like ordinary bonds. It is likewise important to note that the projects financed do not have serious negative social impacts.

3. Structure of the Guidelines

Chapter 2 provides an overview of Green Bonds. The benefits of Green Bond issuances and investments are also explained, as a reference for issuers who are considering to issue Green Bonds and for investors who are considering to invest in them.

Chapter 3 is the core of the Guidelines. In this chapter, the Guidelines describe the elements that Green Bonds are expected to possess and examples of the possible approaches that could ensure that a bond has these elements. The descriptions in this chapter have the following meaning:

(i) Sentences described with the word "should" are basic elements that bonds labelled as "green" are expected to have.

(ii) Sentences described with the word "recommend" are elements that bonds labelled as "green" are optimally expected to have, although a bond which does not have these elements can also be labeled as "green."

(iii) Sentences described with the word "may" are examples of the possible approaches and interpretations related to Green Bonds.

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[8] The Sustainability Linked Loans Principles were published by the Loan Market Association and others in March 2019.

[9] AXA Investment Managers published the Guidelines for Transition Bonds in June 2019. The Guidelines set out requirements for issuers including the following: (1) clear communication of the company-wide environmental strategy concerning the issuer's shift to decarbonization; (2) an assurance to align the achievement of the 2℃ target with the issuer's business; and (3) the requirement to examine whether there is any concern that the transition project may hinder the achievement of global environmental and social goals.

Chapter 4 describes expectation towards investors.

It should be noted that the Guidelines are legally non-binding. No legal penalties will be imposed if a certain action does not comply with the elements described in the Guidelines (including elements described with the word "should"). However, it is necessary to note that, if a certain action infringes upon any laws and regulations, legal penalties may be imposed based on these laws and regulations, even if the action complies with the elements described in the Guidelines.

Chapter 2 Overview of Green Bonds

1. What are Green Bonds?

Green Bonds are bonds issued by companies, local governments, or other organizations to raise funds for domestic and overseas Green Projects. Specifically, these bonds have the following features: (i) proceeds are allocated exclusively to Green Projects, (ii) proceeds are tracked and managed in a reliable manner, and (iii) transparency is ensured by reporting after the issuance of the bonds.

The issuers of Green Bonds include: (i) corporations that raise funds for Green Projects (including Special Purpose Companies ("SPCs")[10] that only handle Green Projects), (ii) financial institutions that raise investment funds and loans for Green Projects, and (iii) local governments that raise funds for Green Projects.

Investors in Green Bonds include: (i) institutional investors, such as pension funds and insurance companies that commit to ESG (environmental, social, and governance) investments; (ii) investment managers entrusted with the management of ESG investments, and (iii) individual investors who focus on the use of the proceeds.

Currently, the GBP list the following four types of Green Bonds, which vary by redemption resources and other characteristics.

Standard Green Use of Proceeds Bond	This bond is issued to raise funds for Green Projects. It constitutes recourse-to-the-issuer debt and its redemption does not depend on the cash flows of specific Green Projects.
Green Revenue Bond	This bond is issued to raise funds for Green Projects. It is a non-recourse-to-the-issuer debt and its redemption depends on the cash flows of public Green Projects such as use fees and special taxes on public facilities linked to Green Projects. For example, bonds whose proceeds are allocated to the development and operation of waste treatment sites by extra-governmental organizations and whose redemption is only possible via the revenue from the projects.
Green Project Bond	This bond is issued to raise funds for Green Projects. It is a project bond and its redemption depends on the cash flows of a single or multiple Green Projects. For example, the bonds in this category are issued by SPCs that exclusively engage in renewable energy generation projects whose proceeds are allocated to develop and operate facilities, and so on, and can be redeemed only by the revenue from the projects.
Green Securitized Bond	The bonds in this category usually have more than one asset linked to Green Projects (including loan claims, lease claims, and trust beneficiary rights) that are used as collateral and are redeemed using the cash flows from these assets. For example, ABS (Asset Backed Securities), backed by assets like loan claims linked to solar panels, energy efficient appliances, equipment, houses, and low-emissions vehicles, such as electric vehicles and hydrogen vehicles, belong to this category.

[10] A SPC (Special Purpose Company) is a corporation established for the limited purpose of acquisition of and financing backed by specific assets (real estate, bonds).

2. Benefits of Green Bonds

(i) Benefits of Issuance

For issuers, the benefits of issuing Green Bonds include the following:

1) Enhancing sustainability management

Working on Green Bonds can lead to the development of, or build on the initiatives already undertaken on, governance, strategy and risk management structures as well as increase internal awareness related to sustainability within an organization such as companies. This also helps satisfy the ESG information disclosure requirement placed by the Task Force on Climate-related Financial Disclosures (TCFD)[11] and others. Furthermore, it will improve the medium- and long-term ESG assessment of issuers, which will in turn help raise their corporate value.

2) Acquisition of public acceptance and realization of reputational gains by demonstrating willingness to promote Green Projects

ince the investment destination for Green Bond proceeds is limited to Green Projects, if issuers, such as companies or local governments, issue Green Bonds, the proceeds are allocated to Green Projects, thereby promoting them. Furthermore, the 'check function' exercised by the bond market will ensure a highly transparent Green Bond framework and subsequent reporting. Therefore, issuers can demonstrate that they are actively promoting Green Projects by issuing Green Bonds, which could possibly earn them public acceptance.

3) Reinforcement of the funding base by building relationships with new investors

The diversification of financing instruments is an effective means for issuers to reinforce their funding bases. Issuing a Green Bond offers issuers the opportunity to consolidate their funding base by building relationships with new investors, who value investment destinations that help to solve environmental problems such as global warming.

4) Possibility of raising funds on relatively favorable terms

For companies that have not built solid relationships with financial institutions, such as emerging renewable energy companies, it may not be possible to obtain loans with advantageous terms. In such cases, a company issuing Green Bonds (Green Project Bonds) or similar instruments that use cash flow generated from renewable energy or other comparable projects it operates with strong business viability to repay interest and redeem bonds may be able to raise funds on relatively favorable terms from investors who are well versed in evaluating the feasibility of such businesses.

(ii) Benefits of Investment

The benefits for investors investing in Green Bonds are as follows:

1) Serving as ESG investments

Some institutional investors are committed to a certain scale of ESG investment. For these investors, Green Bonds are investment instruments which have a highly transparent framework on green characteristics in accordance with market practices, clearly match their commitment, and provide a stable cash flow unless the issuer defaults on them. Moreover, other investors without

[11] The TCFD (Task Force on Climate-related Financial Disclosure) was established by the FSB (Financial Stability Board). The final recommendations, presented in June 2017, encourage companies and investors to conduct climate-related financial disclosures for the appropriate assessment of climate related risks and opportunities and their financial implications for appropriate investment decisions.

such commitments can show that they actively invest in Green Bonds, support Green Projects, and thereby gain public acceptance while obtaining stable cash flows unless issuers default on the debt.

2) Achieving both investment returns and environmental and other benefits

By investing in Green Bonds, investors can support the realization of the environmental benefits (listed below in (iii)) that contribute to creating a sustainable society while simultaneously gaining returns on their bond investments.

3) Direct investments in Green Projects

In light of the global quest for lower GHG emissions based on the Paris Agreement, it is expected that the demand for investment in Green Projects involving renewable energy and energy efficiency will increase substantially. Green Bonds offer investors the opportunity to invest directly in such projects.

4) Risk hedging via alternative investments

Green Bonds issued as project bonds can serve as alternative investments that are regarded as not closely correlated with traditional assets, such as stocks and bonds, in terms of price. Therefore, Green Bonds may serve as an effective asset class for investors who seek to hedge investment risks by diversifying investment destinations. Moreover, when renewable energy and energy efficiency projects, etc., are the investment destinations of Green Bond proceeds, Green Bonds serve as a possible means to hedge risks involving social and economic shifts that are expected to occur in the global efforts for the long-term substantial reduction in GHG emissions based on the Paris Agreement.

5) Engagement

Investors in Green Bonds are able to engage more effectively with issuers concerning the existence of environmental benefits and the size of impact, based on information such as the sustainability of environmental benefits and negative impacts on the environment, which are obtained through the analysis and evaluation of non-financial information related to environmental benefits and other factors disclosed by the issuers. Such increased engagement is expected to result in a favorable cycle of the improved sustainability of the issuers and the better medium- and long-term investment outcome for the investors, which will ultimately lead to the building of a sustainable society.

(iii) Environmental Benefits

Environmental benefits that can be obtained from the issuance of and investments in Green Bonds include the following:

1) Contribution to global environmental conservation

The dissemination of Green Bonds expands private investments in Green Projects, such as renewable energy and energy efficiency projects, to contribute to the long-term substantial reduction in GHG emissions in Japan and abroad. Moreover, other than those contributing to the reduction in GHG emissions, Green Bonds expand private investments in Green Projects and prevent the degradation of natural capital, which is the foundation of long-term profits for companies.

2) Raising individuals' awareness of green investments

The dissemination of Green Bonds will enhance individual awareness of green investments, including Green Bonds, which will in turn motivate institutional investors, etc., who are the trustees of individuals' assets, to actively invest in green investments. Moreover, it will enhance

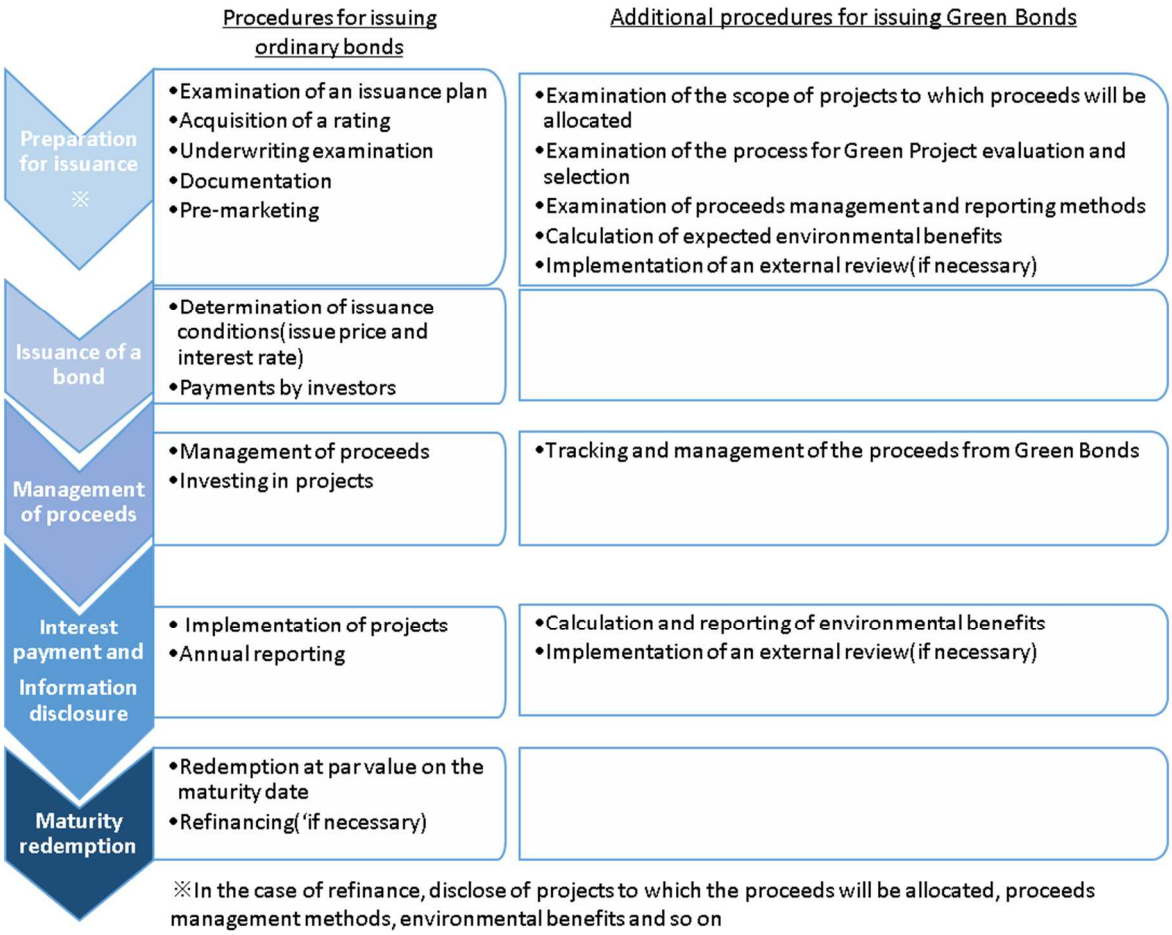
individual interest in the use of savings and investments, contributing to the "greenization" of the economy as a whole.

3) Contribution to resolving social and economic issues through the promotion of Green Projects

The promotion of Green Projects through the dissemination of Green Bonds lowers energy costs, strengthens energy security, reactivates the regional economy, and enhances resilience in the event of disasters.

3. Green Bond Issuance Flow

Companies, local governments, or other organizations that issue Green Bonds need to follow extra procedures, in addition to the procedures required for issuing ordinary corporate bonds, municipal bonds, and securitized products, etc. These extra procedures are illustrated below:



4. What are Sustainability Bonds?

Sustainability Bonds are any type of bond instrument where the proceeds will beexclusively applied to finance or refinancing a combination of Green and Social Projects, and which aligned with the four core components of the GBP and/or Social Bond Principles (SBP)[12].

[12]The Social Bond Principles were published by the International Capital Market Association (ICMA) in June 2017, and similarly to the Green Bond Principles, define Social Bonds to have four core components. Social bonds are the bonds issued to raise funds

The issuance of Sustainability Bonds has grown internationally since the establishment of the Sustainability Bond Guidelines in 2017 with the support of the International Capital Market Association. Sustainability Bonds which include green projects in the use of proceeds offer the same benefits as Green Bonds and are an effective tool to introduce private funds into Green Projects.

While the Guidelines herein set out expected elements and other issues with a focus on the green characteristics of Green Bonds, they also apply to the green characteristics of Sustainability Bonds. Accordingly, the matters described in Chapter 3 (excluding the preamble in Chapter 3, 1. (i)) shall also apply to Sustainability Bonds that have green characteristics, for which the words, Green Bonds, shall be replaced with the words, Sustainability Bonds.

necessary for new or existing social projects that will have a positive social outcome.

Chapter 3 Expected Elements of Green Bonds and Examples of Possible Approaches

1. Use of Proceeds

[Use of Proceeds]

(i) The Green Bonds proceeds should be allocated to Green Projects that have clear environmental benefits. The issuers should assess such environmental benefits and are recommended to quantify them where possible.

(ii) Specifically, the Green Bonds proceeds may be used for Green Projects such as those listed in Annex 1 (including related and incidental costs such as investments and loans, R&D expenses, human resources education expenses and monitoring expenses in connection with such projects).

(iii) Green Projects may have some incidental negative impacts on the environment, in addition to their intended environmental benefits. Green Projects that provide the clear environmental benefits described above are projects whose negative environmental impacts are evaluated by the issuers as limited compared to their environmental benefits.
Annex 2 shows some of the typical examples of such negative impacts.

[Prior provision of information regarding the use of proceeds to investors]

(iv) Issuers should provide investors in advance with information regarding the use of Green Bond proceeds through legal documentation[13] (such as a prospectus) or other documents.

(v) The provision of the information regarding the use of proceeds should specify details of Green Project, such as the construction of facilities for a wind power generation project or lending to projects related to biomass power generation, so that investors and other market participants can evaluate the appropriateness of the use of proceeds. In the cases where individual Green Projects have been specified, it is recommended that issuers clearly present the projects to investors.

(vi) In cases where Green Projects have incidental negative environmental impacts along with the claimed environmental benefits, the issuers should include information regarding these negative impacts (e.g., how they are assessed, what the issuers will do to curb them) to investors so that the investors and market participants can appropriately evaluate these impacts.

[Measures when the proceeds are allocated to refinancing]

(vii) Green Bond proceeds can be allocated not only to new Green Projects but also to refinance existing Green Projects.
While the proceeds allocated to refinancing can maintain existing Green Projects, their environmental significance differs from that of proceeds allocated to finance new Green Projects, since existing Green Projects have already started before refinancing.
In cases where Green Bond proceeds are used to refinance existing Green Projects, it is recommended that the issuers provide information to the investors regarding (1) the amount (or the share) of the bond proceeds being allocated for refinancing, and (2) which Green Projects (or Green Project categories) may be refinanced. Furthermore, when using the proceeds for refinancing Green Projects, the issuers are recommended to indicate the target period of the Green Projects to be refinanced (Lookback Period).
In cases where the percentage of proceeds allocated to new Green Projects is greater than that for refinancing, providing an estimate (or percentage) of proceeds allocated to a new project may serve to enhance the reputation of the Green Bond.

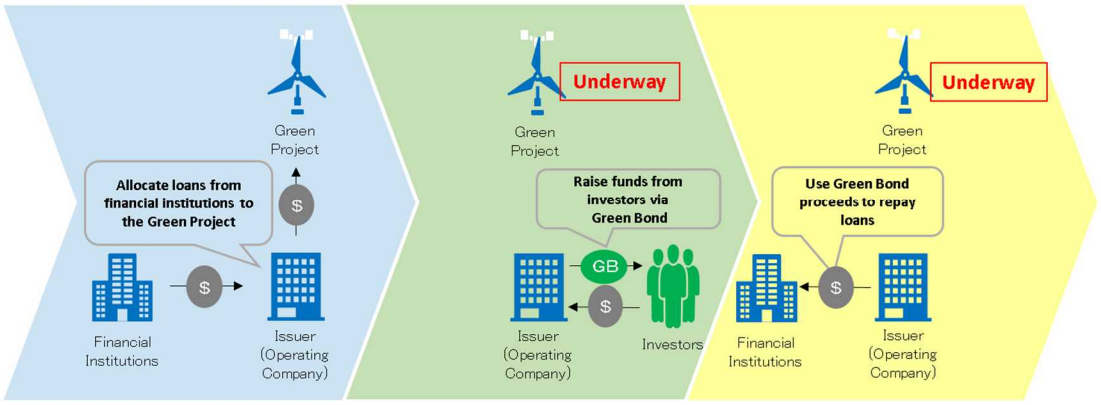
[13] Including agreements made among parties involved.

When Green Bonds are issued multiple times to refinance an asset that requires long-term maintenance, the issuer should clearly disclose the asset's age and remaining useful life and the amount to be refinanced as at the time of the bond issuance, evaluate the long-term sustainability of environmental benefits and obtain an assessment from an external reviewers for verification.

<Possible refinancing examples>

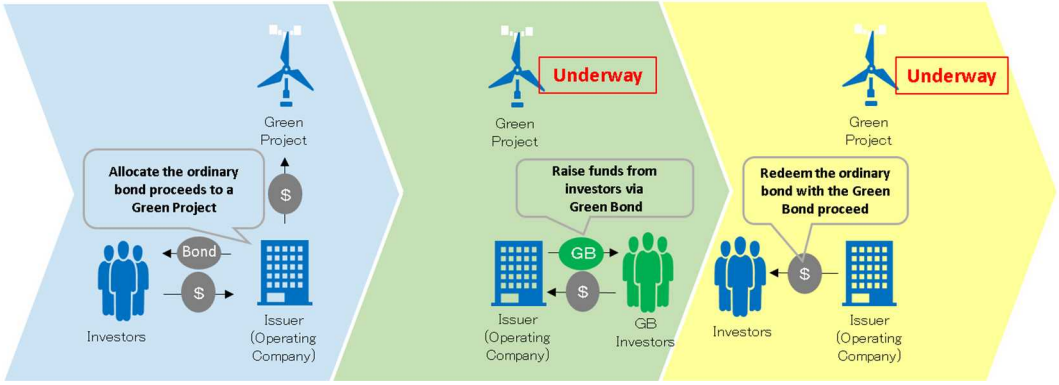
*Possible examples are not limited to the following:

- Cases where the Green Bond proceeds are allocated to repay (refinance) loans related to Green Projects.

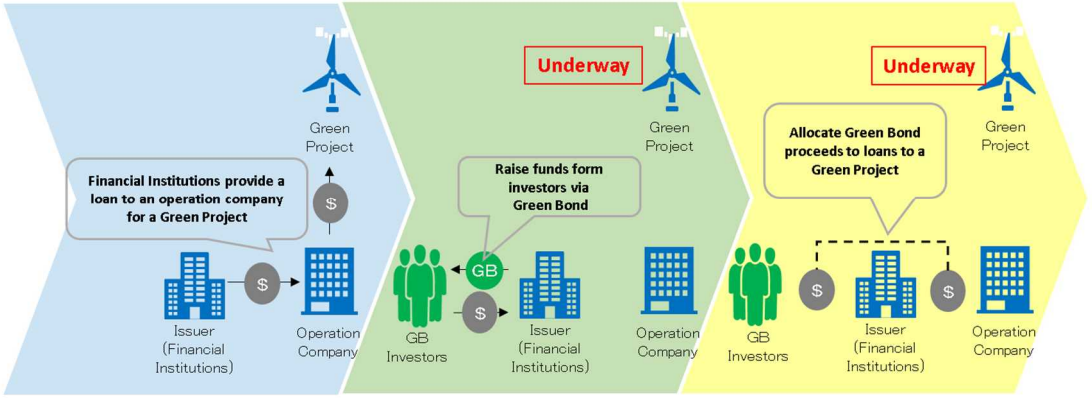


- Cases where new Green Bond proceeds are used to redeem a bond that has been issued to finance existing or completed Green Projects at maturity.

* An example of a completed Green Project may include the construction of green buildings.



- Cases where financial institutions allocate Green Bond proceeds as a resource for existing loans linked to Green Projects.



2. Process for Project Evaluation and Selection

[Prior provision of the information on the process for project evaluation and selection for investors]

(i) Issuers should provide investors in advance with information regarding the following: The environmental sustainability objectives that the issuers intend to achieve through the Green Bonds- The criteria for determining the appropriateness of Green Projects based on the environmental sustainability objectives described above- The process for determining how Green Projects fit the criteria for archieving the claimed environmental sustainability objectives

(ii) When individual Green Projects to which Green Bond proceeds will be allocated have been determined, the projects to which the proceeds will be allocated are deemed to be already evaluated and selected, and it is considered that the establishment of the criteria described above is unnecessary. However issuers should provide investors in advance with information regarding (1) the environmental sustainability objectives that the issuers intend to achieve through Green Bonds and (2) the process for the determination.

(iii) In contrast, when individual Green Projects to which Green Bond proceeds will be allocated to have not been determined (e.g., (1) in cases where an ordinary business operator or local government issues a Green Bond to raise funds for the Green Projects in the relevant business and project category and (2) in cases where financial institutions raise funds for investments and loans for a large number of Green Projects, etc.), the issuers should establish criteria to determine the appropriateness of the Green Projects in light of the objectives, and establish the process for determination and provide investors with the relevant information.

If no individual Green Project has been selected, it is considered possible for the issuers to establish comprehensive standards and processes to evaluate and select Green Projects as those applied to financial instruments such as Green Bonds and Green Loans.

[Environmental Objectives]

(iv) Environmental objectives are the environmental benefits that the issuers intend to achieve through the issuance of Green Bonds. For instance, they may include climate change mitigation and adaptation and the conservation of biodiversity.

[Criteria]

(v) Criteria serve to provide the reasons for determining the appropriateness of specific Green Projects in light of the environmental sustainability objective. For instance, if climate change mitigation or adaptation is the main environmental objective, the funds raised may be used for Green Projects that will reduce GHG emissions such as renewable energy projects.

(vi) The following are examples of the criteria for the determination: It is recommended that the issuers explain to investors in advance any environmental standards or certifications that the issuers will refer to in evaluating and selecting a Green Project to be financed.

<Examples of "criteria" for the evaluation and selection of Green Projects>

*Possible examples are not limited to the following:

- Projects should fall under the business categories specified for the use of proceeds in the GBP or in the Guidelines.
- Projects for renewable energy should not fall under the category of projects with significant negative effects on the environment as specified in the Equator Principles.
- Projects should fall under the category of projects that build energy efficient buildings for certification by environmental certification systems such as LEED, CASBEE, and BELS.

(vii) In some cases, additional requirements to eliminate potential negative effects of Green Projects on the environment are placed as criteria in addition to the appropriateness of the Green Project's business category. (For example, such requirements may exclude hydropower generation facilities of a scale greater than the predetermined standard due to concerns about their potential negative impact on the environment such as land modification.) If an issuer intends to establish an exclusion standard to identify and control such potentially material environmental and social risks of Green Projects, the issuer should explain it to investors in advance as one of the criteria it applies.

[Process]

(viii) The process for evaluation and selection of Green Projects refers to, for example, the basis for how issuers determine why certain projects can provide environmental benefits appropriately in light of the objectives and criteria for the use of Green Bond proceeds, how and by whom the above criteria are applied and used to determine whether Green Projects are appropriate in light of the environmental objectives (which division actually conducts the evaluation and selection, and determines the appropriateness).

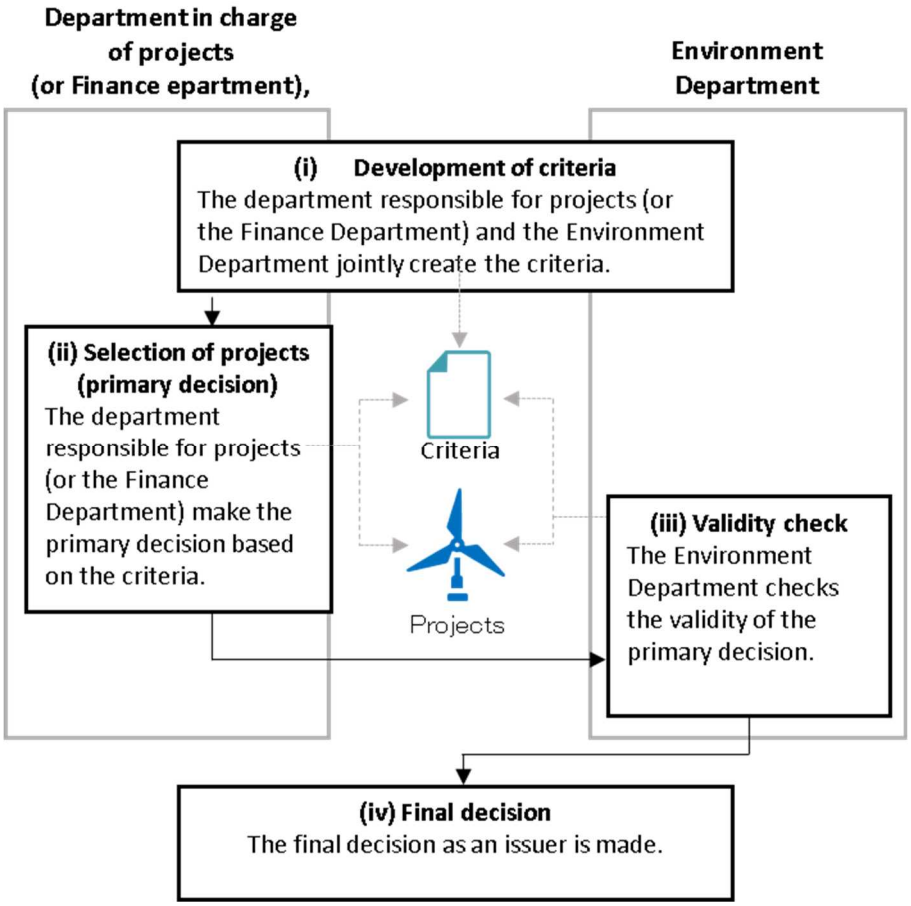
(ix) It is recommended that internal departments who have expertise, such as the environment related department, or external institutions are involved in the evaluation and selection process of Green Projects to ensure suitability from an environmental point of view.

(x) The following is an example of the project evaluation and selection process of Green Projects:

<Example of a decision-making process>

*Possible examples are not limited to the following:

- An internal department responsible for projects (or the Finance Department) and the Environment Department jointly develop the criteria. After the department responsible for projects (or the Finance Department) uses the criteria to make a primary decision regarding project eligibility and the Environment Department checks the validity of the primary decision, the company arrives at a final decision.



[Integration with comprehensive objectives, strategies and so on]

(xi) It is recommended that issuers position their environmental objectives, criteria and information on their processes in the context of their comprehensive environmental sustainability objectives, strategy, policies and so on (e.g. medium-term management plan, sustainability strategy, CSR strategy) when explaining them to investors. It is also recommended that issuers provide explanation to investors as requested post issuance.

This is particularly important given that the companies with poor ESG assessment and companies with exposure to the sectors and technologies that divide the opinions of market participants are currently deemed eligible to issue Green Bonds as long as the proceeds are used for Green Projects. It is recommended that issuers provide a full explanation to investors on the following items which will become important in such cases.

- Comprehensive environmental sustainability objectives, strategy and so on (including, for instance, a transition plan to achieve such objectives)
- Contribution the selected Green Project is expected to make in achieving such comprehensive objectives
- Methods to identify and manage potential environmental and social risks related to the said project

3. Management of Proceeds

(1) Management of Proceeds

[General Information]

(i) The issuer should track and manage the entire amount of Green Bond proceeds or the amount equivalent thereto in an appropriate manner to ensure that the funds it raised are allocated to Green Projects without fail. These tracking and managing activities should be controlled by the issuer's internal process.

(ii) As long as the Green Bonds are outstanding, the issuer should conduct periodical checks (at least yearly) to ensure that the amount allocated to Green Projects is equal to or greater than the amount raised by the issuance of Green Bonds or that the sum of the amount allocated to Green Projects and the amount of the unallocated proceeds matches the total amount of Green Bond proceeds. If any of the proceeds remains temporarily unallocated, the issuer should explain to investors how it intends to manage the balance of such unallocated funds and endeavor to promptly allocate such funds to Green Projects[14].

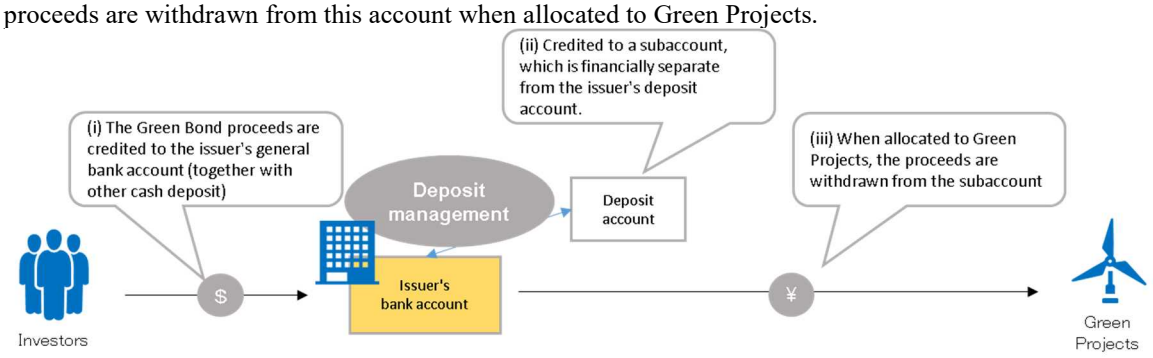
[Proceed tracking and management methods]

(iii) Possible proceed tracking and management methods include the following:

<Examples of possible proceed tracking and management methods>

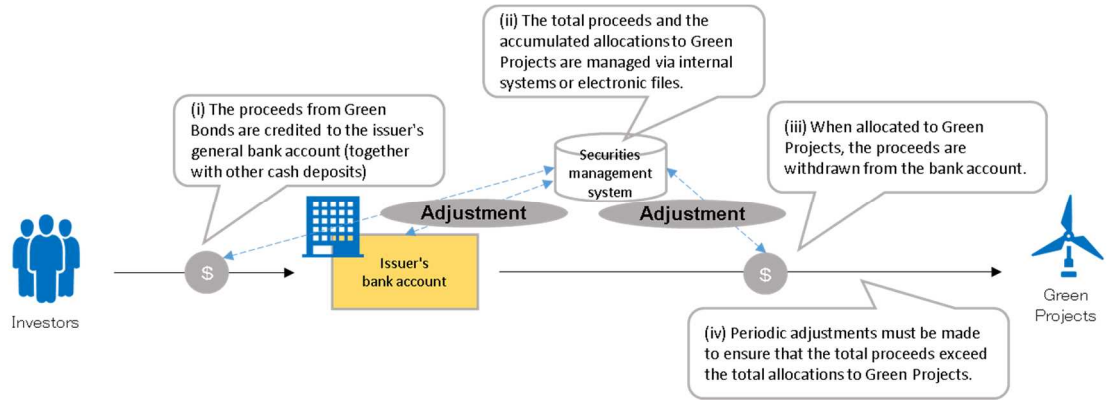
*Possible examples are not limited to the following:

- The Green Bond proceeds are credited to a subaccount that is financially separate from other accounts, and the proceeds are withdrawn from this account when allocated to Green Projects.

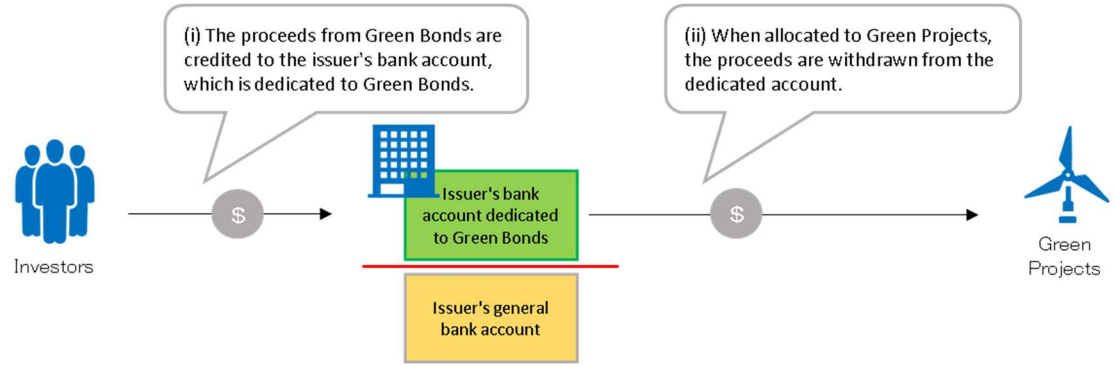


- Manage the total proceeds and the accumulated allocations to Green Projects via internal systems or electronic files and periodically adjust to ensure that the latter exceeds the former.

[14] For instance, financial institutions often provide multiple loans for Green Projects for which Green Bond proceeds are to be used and the maturities of such loans do not match the maturity of Green Bonds. As a result, when a loan is repaid, the loan balance will be smaller than the amount of funds initially raised by the issuance of Green Bonds. In this case, adjustments will become necessary such as reallocating Green Bond Proceeds to a different new Green Project.



- The Green Bond proceeds are credited to a separate account and managed separately from other business funds. When allocating the proceeds to Green Projects, the proceeds are taken out from the said separate account.



[Prior provision of information on tracking and management methods to investors]

(iv) Issuers should provide investors in advance with information on how Green Bond proceeds will be tracked and managed.

(v) It is recommended that issuers keep evidenced documents appropriately that demonstrate how they tracked and managed Green Bond proceeds.

(2) Management of unallocated proceeds

[Early allocation of proceeds]

(vi) The recommendation is to allocate the Green Bond proceeds to Green Projects early and that issuers must not avoid allocating the proceeds to Green Projects unless there are reasonable grounds.

[Prior provision of information regarding the methods to manage unallocated proceeds]

(vii) Issuers should provide investors, in advance, with information on how unallocated Green Bond proceeds will be managed when the Green Projects that will receive the Green Bond proceeds have not been determined, or when such Green Projects have been determined but the proceeds have not been allocated because the allocation timing has not yet arrived.

[Methods to manage unallocated proceeds]

(viii) It is recommended that issuers manage unallocated Green Bond proceeds as an asset with high liquidity and safety such as cash, cash equivalents, or short-term financial assets.

(ix) In some advanced cases, unallocated proceeds are deposited into a bank account with an appropriate environmental management policy with respect to the green attitude of investors. This

would be meaningful in instances where investors have a strong preference for their assets to be invested in ESG-related or green financial products.

4. Reporting

[Disclosure of the status of the use of proceeds after the issuance of Green Bonds]

(i) Investors invest in Green Bonds because they expect that their funds will be allocated to Green Projects that have environmental benefits. Moreover, if issuers want to gain public acceptance by expressing that the issued bonds are Green Bonds, they need to ensure transparency. Based on these conditions, issuers should publicly disclose the latest information on the use of Green Bond proceeds after issuance.[15] This disclosure is, for example, considered to be posting the information on the issuers' official websites.

[Timing of Disclosure]

(ii) Issuers should disclose the usage status of funds at least once a year until all the proceeds are used and whenever there has been a major change in the situation. They should disclose such information in a timely manner even after all the proceeds are allocated if there has been any major change in the situation.

A major change in the situation includes, but is not limited to, the sale of the asset or project for which the proceeds are used, a serious accident in the project or the occurrence of an event that affects green characteristics.

[Contents and ways of disclosure]

(iii) Disclosed information should include the following contents:

<Contents>

- A list of the Green Projects to which Green Bond proceeds have been allocated
- A brief description of each Green Project (including up-to-date progress)
- The amount allocated to each Green Project
- The expected environmental benefits of each Green Project
- Information regarding unallocated Green Bond proceeds (the amount of the unallocated proceeds or the share of the unallocated proceeds to the total amount of the proceeds, when the unallocated proceeds are expected to be allocates to Green Projects, and how the unallocated proceeds are managed until allocation)

(iv) If Green Bond proceeds have been allocated to the refinancing of existing projects, it is recommended that disclosed information include: 1) the approximate amount (or the share) of the allocated proceeds used for refinancing, and 2) a list of the Green Projects (or the project categories) refinanced.

(v) While it is recommended to disclose (iii) and (iv) on a project-by-project basis, if there are confidentiality agreements, competitive considerations, or a large number of underlying projects that limit the disclosure of details, it is considered that information is presented in generic terms or in an aggregated portfolio. (For example, disclose information regarding the previously described items by project category, such as wind power generation projects, projects to introduce high-energy efficient equipment, or projects for the construction and management of waste recycling-related facilities.)

(vi) More specifically, disclosure methods may include those described in Annex 3.

[15]Information disclosure as specified in the Guidelines does not unconditionally ensure compliance with financial laws, rules of the stock exchange, or rules of self-regulatory organizations. Regardless of the disclosure specified in the Guidelines, information must be disclosed according to the requirements of the above mentioned laws or rules.

[Indicators and methods for calculating environmental benefits][16]

(vii) When disclosing information regarding the expected environmental benefits of projects, issuers should use appropriate indicators while ensuring consistency with the "environmental sustainability objectives," the "criteria" for Green Projects specified in Section 2, "Process for Project Evaluation and Selection," and the characteristics of Green Projects.

(viii) When disclosing the expected environmental benefits of projects, it is recommended that issuers, where feasible, use quantitative indicators and disclose information on methodologies and/or assumptions as well as these indicators. When quantification is difficult, external certifications, such as LEED, CASBEE, BELS, FSC, MSC, or ASC, obtained through Green Projects are also considered to be used as qualitative indicators.

(ix) More specifically, such indicators may include, but are not limited to, those listed in Annex 4.

(x) Specific examples of methodologies for the calculation of environmental benefits may include those explained in Annex 5 when using quantitative indicators.

(xi) In more advanced examples, the basis of the calculation of environmental benefits is presented in more detail such as, "Introduce XX units of YY equipment whose efficiency is Z% better than the existing equipment."

5. External Review

(1) General matters related to external reviews

[General Information]

(i) It is recommended that issuers utilize an external review in case that they need an objective assessment of the alignment of their approaches with the framework for Green Bond issuances. External reviews have many different names such as "second party opinion," "verification," "certification" and "rating."[17] Such reviews can be particularly useful in the following cases:

<Examples of cases where the use of external reviews is particularly useful>

*Possible examples are not limited to the following:

- Cases where the Green Projects designated for a Green Bond include those that have negative environmental effects in addition to environmental benefits, and where an issuer seeks an objective evaluation of the appropriateness in allocating proceeds to such projects.
- Cases where an issuer needs an objective external evaluation of the appropriateness of the determination criteria or the appropriateness of the criteria-based determination of Green Projects since no such expertise exists within the issuer's organization.
- Cases where an issuer requires an objective evaluation of the appropriateness of the environmental benefit calculation method developed by the issuer since the Green Projects to which the proceeds will be allocated are relatively unique and therefore, there is no existing framework for calculating the environmental benefits of the projects.
- Cases where an issuer needs to promote an understanding of Green Bonds among selected overseas investors who are unfamiliar with Green Projects and their associated information in Japan.

(ii) In cases where an external review of the entire framework of a Green Bond was conducted in the past and where an issuer plans to issue a new Green Bond with the same framework, it is considered

[16] 'Handbook – Harmonized Framework for Impact Reporting' and 'Guidance Handbook June 2019' by ICMA provides guidance on indicators and calculation methodologies for expected environmental benefits.

[17] GBP defines Rating as the ranking of the green nature of the framework of a Green Bond based on the criteria of a qualified third party, such as information vendor and a rating agency.

that the issuer does not have to conduct an external review again.[18] Examples include cases where an SPC engaged exclusively in the implementation of Green Projects had an external review of the projects' environmental benefits and where the SPC plans to issue more than one Green Bond linked to the same type of projects. However, if an external review is not utilized, the issuer may be required by investors and other market participants to describe the appropriateness of the Green Bond framework in a highly transparent manner.

[Examples of contents that can be externally reviewed]

(iii) Examples of contents that can be externally reviewed include the following:

<Examples of external review contents>

*Possible examples are not limited to the following:

1) Reviews before the issuance of Green Bonds

- The evaluation of the appropriateness of Green Projects to which the proceeds will be allocated.
- The evaluation of the appropriateness of the determination criteria and the appropriateness of the criteria-based determination process.
- The evaluation of the appropriateness of specific methods to track and manage the proceeds from Green Bonds.
- The evaluation of the appropriateness of the expected environmental benefits (or actual environmental benefits in the case of refinancing) of Green Projects (including the appropriateness of the methods for calculating environmental benefits and preconditions for the calculation).

2) Reviews after the issuance of Green Bonds

- The evaluation of whether the management of the Green Bond proceeds and the allocation of the proceeds to Green Projects were executed properly by using the methods specified by the issuer before the issuance of the Green Bonds.
- The evaluation of whether the Green Projects to which the Green Bond proceeds were allocated have actual environmental benefits and if they were calculated properly by using the methods specified by the issuer before the issuance of Green Bonds.

[Disclosure for external reviewby issuers]

(iv) If issuers have their Green Bonds reviewed, issuers should disclose the documents showing the review results.[19]

(2) Criteria to be followed by external reviewers

External reviewers should follow the basic criteria below when giving reviews.

[Ethical standards as professionals[20]]

(i) Integrity

External reviewers must consistently act with integrity and must not take any part in the preparation and disclosure of reviews based on any reports or information that they recognize as falling into any of the following.

- Information that contains materially false or misleading statements
- Information that contains statements or information that are prepared without due caution required in the performance of duties
- When any omission or obfuscation of necessary information will cause misunderstanding, information that omits or obfuscates such information

[18]However, care is possibly necessary when deciding whether or not an external review is required, since there are cases where the approaches to the appropriateness of the schemes of Green Projects and Green Bonds have changed or where the evaluation criteria of external reviewers have changed since the last review.

[19] Issuers may consider reporting to and listing of their documents on the ICMA green bond data base as part of their public disclosure. （https://www.icmagroup.org/green-social-and-sustainability-bonds/green-social-and-sustainability-bonds-database/#HomeContent）

[20]The ethical standards of external reviewers as professionals are based on the "Code of Ethics for Professional Accountants" established by the International Ethics Standards Board for Accountants of the International Federation of Accountants and the corresponding JICPA Code of Ethics established by the Japanese Institute of Certified Public Accountants.

(ii) Fairness

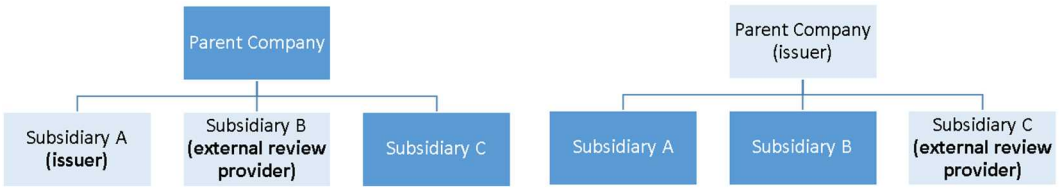
External reviewers should desist preconception, avoid conflicts of interests, defy unfair influence of others and consistently maintain a fair standpoint. If they are required to distort facts or bias a review to justify the predetermined conclusion, they should decline from providing a review as professionals.
Maintaining a fair standpoint means to require objectivity in the judgment of business operations. More specifically, external reviewers should be independent from and should ensure impartiality against the issuer. It is recommended that whether external reviewers have such impartiality is judged based on personal or capital relationships. For example, an external review is not considered to be independent in the following cases:

<Examples where it is not considered to be independent>

*Possible examples are not limited to the following:

<Capital relationships>

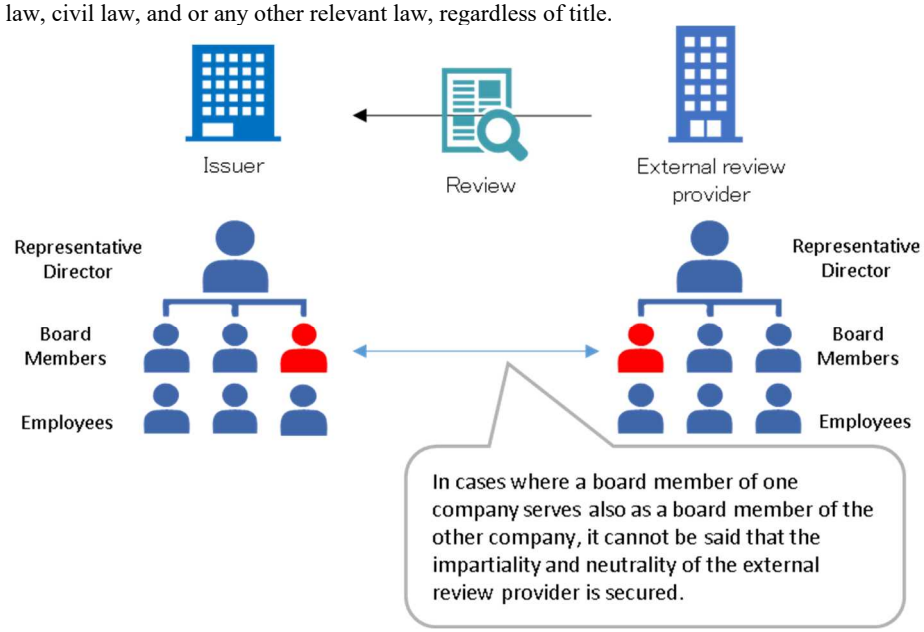
- Cases where an issuer and an external reviewers are subsidiaries of the same parent company - Cases where an issuer is the parent company of an external reviewer (subsidiary)



<Personal relationships>

Cases where a board member or one in a similar position* of one company (issuer) also serves as a board member of the other company (external reviewer)

* A board member or one in a similar position could include the representative director, auditor, executive, and or one in any other position with legal authority over the execution and or the auditing of operation and finances under corporate law, civil law, and or any other relevant law, regardless of title.



(iii) Abilities and due care as professionals

External reviewers need to maintain the level of abilities necessary to perform their duties when providing an external review in order to provide an appropriate external review.
External reviewers should observe what is required of them as professionals and perform their duties with due care.

External reviewers should confirm that any party that works under their instructions is receiving appropriate training and supervision when performing their duties.
External reviewers are required to satisfy the following requirements in respect of their expertise as professionals.

- Constantly keep up with and understand the relevant knowledge including international market trends and the latest trends in professional practices in their specialist areas, always endeavor to improve their skills and continually update their expertise.
- Have the relevant expertise depending on the type of external reviews they provide and the type of Green Projects for which they provide a review.
- Employ or invite other specialists in the areas where they do not have sufficient expertise. It is not necessary for one external reviewer to evaluate all the aspects of an issue of Green Bonds. It is considered possible for more than one external reviewers to review different aspects of it based on the expertise of each provider.

The possible expertise of external reviewers includes the following:

<Examples of expertise>

*Possible examples are not limited to the following:

1) When reviewing the appropriateness of Green Projects to which proceeds will be allocated, the appropriateness of the evaluation and selection process of Green Projects and the appropriateness of environmental benefits
Expertise such as the criteria to determine whether any environmental benefit exist, indicators to be referred to when verifying the method to quantify environmental benefits, environmental evaluation and environmental certification
2) When reviewing the appropriateness of the management and allocation of proceeds and so on
Expertise in financial and accounting audits

(iv) Duty of confidentiality
External reviewers must not disclose to others or use for the benefit of themselves or third parties any information they have come to possess in the course of their duties without any justifiable reason. With respect to their compliance with the duty of confidentiality, external reviewers should establish, publish or provide their customers with a policy, structure and so on concerning the protection of customer information.

(v) Actions as professionals
External reviewers should be aware of their position as professionals and satisfy what is required of them as professionals and should not take any action that will harm the credibility of or bring disrepute to external reviewers in general.

[Requirements of external reviewers as an organization]

(vi) As an organizational framework to perform external reviews, external reviewers should have an adequate organizational structure to appropriately undertake external reviews and should have predetermined methodologies and procedures to conduct external reviews.

(vii) External reviewers should hire a reasonable number of people who have professional experience and qualifications necessary to cover the areas subject to the external reviews to be performed.

(viii) When using liability insurance concerning their areas of expertise, external reviewers should mention the scope of coverage of such insurance.

[Contents to be evaluated by external reviewers]

(ix) External reviewers will evaluate the following content dependent on the type of external review.

1) External reviewers should evaluate the intended environmental benefits of the Green Project for which the funds are to be used.
2) External reviewers should check and evaluate the consistency with the four elements expected of Green Bonds.
3) External reviewers should, as needed, evaluate the potential material environmental risks (negative impacts) specified by the issuer in connection with Green Projects.

[Information that should be included in documents and so on concerning external review results]

(x) External reviewers should include a general description of the purpose of an external review, scope of the review, qualifications of the persons who conduct the external review and their expertise as external reviewers. At least, they need to show where such information is available. For instance, it is recommended that external reviewers clearly demonstrate their expertise in documents and so on concerning review results by including statements such as the following.

<Examples of description concerning the expertise of external reviewers>

*Possible examples are not limited to the following:

<Expertise>

"Our company has offered environmental evaluation services for about XX years and has solid expertise in this field."

(xi) External reviewers should include in the documents and so on concerning their review results a statement on their independence from the issuer and their policy on conflicts of interest. At least, they need to show where such information is available.

(xii) There are various types of external reviews. Even if they have the same name, what they evaluate or the criteria they use for evaluation may differ. To make easier for review users to understand their contents, external reviewers should clearly explain in the documents and so on concerning their review results the definitions they use and their analytical approach and methodologies including the evaluation criteria applied to respective items. For instance, these may include the following.

<Examples of the description of information concerning external reviews>

*Possible examples are not limited to the following:

This review evaluates the following aspects of the Green Bond:

(i) Reviews before the issuance of Green Bonds		
Evaluation Aspects	Target	Evaluation Criteria
- The evaluation of the appropriateness of Green Projects to which the proceeds will be allocated.	○	Evaluation criteria of the company[21]
- The evaluation of the appropriateness of the determination criteria and the appropriateness of the criteria-based determination process.	○	Evaluation criteria of the company
- The evaluation of the appropriateness of specific methods to track and manage the proceeds from Green Bonds.		
- The evaluation of the appropriateness of the expected environmental benefits of Green Projects (including the appropriateness of the methods for calculating environmental benefits and preconditions for the calculation).	○	Evaluation criteria of the company
(ii) Reviews after the issuance of Green Bonds		
Evaluation Aspects	Target	Evaluation Criteria
- The evaluation of whether the management of the Green Bond proceeds and the allocation of the proceeds to Green Projects were executed properly by using the methods specified by the issuer before the issuance of the Green Bonds.		
- The evaluation of whether the Green Projects to which the Green Bond proceeds were allocated have actual environmental benefits and if they were calculated		

[21]While it is sometimes difficult to disclose detailed evaluation "criteria", it is recommended to clearly state what type of criteria was used as much as possible.

properly by using the methods specified by the issuer before the issuance of Green Bonds.		

(xiii) External reviews should include a conclusion and outputs including marginal items evaluated in external reviews. At least, they need to show where such information is available.

Chapter 4 Expectations Toward Investors

A characteristic of Green Bonds is to use the bond proceeds only for projects that will have environmental benefits, that is, Green Projects. Annex 1 to the Guidelines herein show some of the projects which could qualify as Green Projects. These are, however, examples only and the final decision is left to each investor deciding whether or not to invest in Green Bonds. The role of investors is therefore extremely important for the sound development of the Green Bond market.

Based on the above, it is recommended that, when making investment decisions concerning Green Bonds, investors appropriately assess whether the project for which the relevant Green Bond proceeds are used has any environmental benefit, the magnitude of its impact and other relevant factors. When doing so, investors are recommended to bear in mind that Annex 1 herein only shows examples and should make decisions on a case-by-case basis, even with respect to the kinds of projects included in Annex 1, based on factors such as the environment of the given project, whether the relevant project has any negative impacts and its implications, and international trends regarding Green Bonds. Furthermore, where an external review is available, investors are recommended to carefully examine the documents concerning the external review results and make final investment decisions based on their own appropriate evaluation of the relevant Green Bonds without solely relying on the external review. Furthermore, after investing in Green Bonds, investors are recommended to perform appropriate monitoring on factors such as the management status of the bond proceeds by the investee, whether the expected impact has arisen and any change in the situation.

To enable the above, investors need to have the ability to make appropriate decisions. Accordingly, it is recommended that investors develop considerable insight regarding sustainable development, accumulate knowledge on Green Projects and also pay full attention to international trends regarding Green Bonds.

These are necessary for whom practicing ESG investment such as institutional investors to gain support from society, which in turn is expected to contribute to the sound development of Green Bonds and the building of a sustainable society.

Chapter 5 Revisions of the Guidelines

Given the objective to further develop the markets for green bonds market, the Guidelines will be revised in response to the maturing of the Japanese market, international trends and other changes in the situation.

Annex 1. Possible examples of the use of proceeds

The following is not an exhaustive list and only shows some of the examples. It will also be necessary to pay close attention to developments regarding international practice when considering whether certain green projects qualify.

1) Projects for renewable energy (including generation, transmission, appliances, and products)
   - Renewable energy projects involving solar power, wind power, hydropower, biomass (only those whose sustainability has been confirmed or those which derive from waste material), geothermal power and so on
   - Projects to install, manage, and maintain power lines that transmit electricity generated by renewable energy, and batteries that store the electricity, adjust to demand and supply, and store energy
   - Projects to manufacture appliances and products used in the aforementioned projects, such as solar panels, power lines, and batteries
   - Projects that engage in renewable energy-derived heat utilization, such as solar heat and geothermal heat
   - Use of renewable energy for all or part of the power used in offices, plants, houses and so on
   - Projects to offer ICT solutions (including maintenance and management systems, operation systems, optimum supply-demand balancing etc.) for projects contributing to renewable energy
2) Projects for energy efficiency (such as in new and refurbished energy efficient buildings, energy storage, district heating, smart grids, appliances and products)
   - Projects for the construction of highly energy efficient buildings, including the net zero energy house (ZEH) and net zero energy building (ZEB)
   - Projects to renovate offices, plants, and houses for better energy efficiency (including renovation to install insulation) to gain high-energy performance certifications such as the LEED, CASBEE, or BELS certifications
   - Projects to introduce highly energy efficient equipment and facilities into offices, plants, and houses
   - Projects for the development and introduction of smart grids
   - Projects to offer ICT solutions for energy saving (Building Energy Management System (BEMS), Home Energy Management System (HEMS), Continuous Emission Monitoring Systems (CEMS), ITS, supply chain management, etc.), and so on
3) Projects for pollution prevention and control (including waste water treatment, GHG control, soil remediation, 3R-based [reduce, reuse, recycle] waste management and waste-to-energy, and associated environmental monitoring analysis)
   - Projects that contribute to achieving a circular economy (designing and manufacturing of resource-saving and long-life products; use of materials with environmental load reduction benefits such as recycled materials and recyclable resources; inverse manufacturing (i.e. designing and manufacturing of products based on the preplanned flow of collection, disassembly, selection and reuse); advanced collection and disposal of waste (including recycling and heat recovery))
   - Projects to control the release of toxic chemicals into the environment by, for instance, introducing advanced facilities and technologies or using alternative products for the prevention of leaks, volatilization and infiltration of toxic chemicals
   - Projects to prevent the release of fluorocarbons into the atmosphere, to collect and to destroy fluorocarbons (including designing and manufacturing of products contributing to the control of fluorocarbons)
   - Projects to build facilities that contribute to the advanced treatment and recycling of wastewater from plants, etc.
   - Projects for the treatment of polluted soil
   - Projects to contribute to the prevention of environmental pollution by marine plastic waste

- Projects to provide ICT solutions to, for instance, help manage and prevent the release of water pollutants, air pollutants and toxic chemicals and manage waste disposal, and so on

4) Projects for the sustainable management of living natural resources and land use (including environmentally sustainable agriculture, fishery, aquaculture, and forestry, integrated pest management (IPM), weed management, and drip-irrigation)
- Projects to acquire sustainable fishery and aquaculture certifications such as the MSC (Marine Stewardship Council) and ASC (Aquaculture Stewardship Council) certifications
- Projects related to conservation and restoration of aquatic resources
- Projects to acquire sustainable forestry certifications such as the FSC® (Forest Stewardship Council) certification
- Projects related to sustainable afforestation programmes and conservation and restoration of natural landscapes
- Projects to provide ICT solutions to contribute to the sustainable management of living natural resources and land use(including traceability systems concerning sustainability of agriculture, forestry and fishery resources), and so on
- Projects to conserve and or to create urban greenery and green networks in collaboration with local municipalities

5) Projects for terrestrial and aquatic biodiversity conservation (including the protection of coastal, marine, and watershed environments)
- Projects for the conservation of wetlands and coral reefs
- Projects to prevent and eliminate bird or animal damage or non-native species for prevention of damage to ecosystem inflicted by birds and animals such as deer or non-native species
- Projects for the transformation of river walls into more natural forms
- Projects to provide ICT solutions to contribute to the preservation of biodiversity (ecosystem monitoring by use of satellites, flight vehicles, IoT, etc., forest management systems, bird and animal damage prevention systems, biodiversity data analysis), and so on

6) Projects for clean transportation (such as energy efficient next-generation vehicles, public transportation, railways, bicycles, non-motorized, multi-modal transportation, infrastructure for clean energy vehicles and the reduction of harmful emissions)
- Projects for the development or manufacture of energy efficient next-generation vehicles, such as electric vehicles, fuel-cell vehicles, hybrid vehicles, and plug-in hybrid vehicles and the development and maintenance of infrastructure for the use of such vehicles
- Projects to enhance the efficiency of logistics systems by the systematic installation of logistics bases, aggregation of transportation networks, modal shifts, and coordinated transportation and delivery.
- Projects to introduce devices (such as digital tachographs) to support eco-driving
- Projects to develop facilities for park-and-ride and car-sharing systems, and so on

7) Projects for sustainable water management (including sustainable infrastructure for clean and/or drinking water, sustainable urban drainage systems, and river training and other forms of flood mitigation)
- Projects to conserve the water circulation cycle, such as water source protection and penetration of rainwater into soils (including the development of green infrastructure)
- Projects to develop and improve flood prevention facilities
- Projects for seawater desalination, and so on

8) Projects for climate change adaptation (including information support systems, such as climate observation and early warning systems)
- Projects to reinforce disaster prevention functions of logistics, railways, ports, airports, roads, water supply infrastructure, waste disposal facilities, traffic safety facilities and private real estate
- Projects to ensure the sustainability of businesses such as measures against climate disasters or

relocation from areas with higher climate risks, measures against heat, efforts to ensure a stable supply of raw materials
- Projects to improve green infrastructure such as adaptation based upon ecosystem or ecosystem-based disaster risk prevention reduction (ECO-DRR)
- Projects related to development and introduction of crop species that are resilient to climate change or introduction of agriculture with small environmental loading
- Projects concerning climate observation and monitoring or early warning system or projects to provide IT solutions that contribute to adaptation to climate change
- Projects related to, for instance, efficient utilization of water resources or introduction of drought management, and so on

9) Projects concerning eco-efficient products, production technologies, and processes (including the development and introduction of environmentally friendlier, eco-labeled, or certified products, and packaging using recyclable or renewable resources or other materials which reduce environmental loading)
- Projects to manufacture products that may obtain environmental certification or environmentally compatible products (including contraction and renovation of plant and offices to be used for the manufacture of those products)
- Projects for the research, development, and introduction of technology and products that contribute to reducing the amount of greenhouse gas, and so on

10) Projects concerning Green Buildings
- Projects to newly build or renovate Green Buildings that not only are energy efficient but also address a wide range of issues for consideration such as water consumption or waste management in compliance with domestic standards or with an environmental certification that demonstrates a high level of efficiency in the environmental certification system such as CASBEE certification and LEED certification

(Reference) Environmental Certifications

(*Note that these certification systems do not guarantee that certified projects are genuinely green.)

■Green Building Certifications

- LEED certification system (Certification body: U.S. Green Building Council)

LEED stands for **Leadership** in Energy and Environmental Design A certification programme for Green Buildings that started in the U.S. It assesses the energy efficiency and other comprehensive environmental load of buildings through various systems covering everything from planning and design to construction, operation and maintenance of the buildings. For buildings that satisfy the required conditions, there are four certification levels—standard, silver, gold, and platinum—that are granted according to the points earned.

- CASBEE certification system (Certification body: Institute for Building Environment and Energy Conservation)

CASBEE stands for the Comprehensive Assessment System for Built Environment Efficiency. Buildings are evaluated and rated according to their environmental performance. This system evaluates building quality comprehensively, evaluating not only the use of energy efficient and environmentally-friendly materials, but also interior comfort and harmony with the surroundings. The evaluation results are rated on a scale of one to five levels ranging from S rank (excellent) to C rank (inferior).

- BELS certification system (Certification body: Association for Housing Performance Evaluation and Labeling)

BELS stands for Building-Housing Energy-efficiency Labeling System. This certification system is based on the Guidelines for Building Energy Efficiency Labeling (guidelines for labeling the energy consumption of buildings) developed by the Ministry of Land, Infrastructure, Transport, and Tourism.

Based on their primary energy consumption, a third-party organization objectively evaluates the energy efficiency of buildings and ranks their results on a five-star scale.

- DBJ Green Building certification system (Certification body: Development Bank of Japan and Japan Real Estate Institute)A certification system which makes, not only an evaluation on the environmental performance of the property, but a comprehensive evaluation including the wellbeing of tenants, risk management regarding disaster reduction and crime prevention, consideration for community and surrounding environment, and cooperation with stakeholders. The evaluation results are rated between five stars (building with excellent considerations, and nationally top of the class) and one star (building with sufficient considerations). If the evaluation regarding the environmental performance items can be confirmed in the total evaluation, it is considered to be effective as an environmental certification.

- BREEAM certification system (Certification Body: Building Research Establishment)

BREEAM stands for Building Research Establishment Environmental Assessment Method. This certification system was developed by the Building Research Establishment (BRE) and an energy and environment consultancy ECD Energy and Environment in 1990. Assessment is conducted on a maximum of ten category issues: management, health and wellbeing, energy, transport, water, materials, land use, waste, pollution, innovation. Assessment results are given on a five point scale ranging from Outstanding to Pass. It is the world's first environmental performance assessment indicator and is used widely in and out of the United Kingdom.

■Certifications for Sustainable Forestry and Fishery

- FSC certification system (Certification body: Forest Stewardship Council)

This is an international certification system of lumber and lumber products sourced from forests managed responsibly in a manner that is appropriate from a viewpoint of environmental conservation, consistent with social interests and economically sustainable. This system consist of two types of certifications supported by various stakeholders worldwide, namely, Forest Management (FM) certification, which is based upon principles and standards of responsible forest management, and Chain-of-Custody (CoC) certification, which covers the processing and distribution processes.

- PEFC certification system (Certification body: Sustainable Green Ecosystem Council)

Like the FSC Certification System, the PEFC Certification System consists of two types of certifications, FM Certification and CoC certification. The PEFC Certification System is a forest certification system for its participant countries, which are mainly European and American countries, to mutually recognize forest certification systems that each participant establishes on a national or regional basis. In addition to the foregoing, Japan has its own forest certification system called SGEC (Sustainable Green Ecosystem Council).

- MSC certification system (Certification body: Marine Stewardship Council)

This certification system comprises two types of certifications: fishery certification, which concerns fishing operators who conduct appropriately-managed fishery business with appropriate attention paid to the aquatic resource and ecosystem from the viewpoint of sustainability, and COC (Chain-of-Custody) certification, which concerns distribution and processing operators and aims to prevent the marine products captured by operators with the fishery certification from being mixed with other marine products during the distribution and processing process.

- ASC certification system (Certification body: Aquaculture Stewardship Council)

This system certifies that aqua farmers manage environmentally-friendly aqua farms with consideration for local communities. An ASC label is attached to marine products produced by certified aqua farms. As of January 2020, there are twelve types of certification for aquaculture products produced (salmon, seriola/cobia, freshwater trout, seabass/seabream/meagre, flatfish, tropical marine finfish, tilapia, pangasius, bivalves, abalone, shrimp, seaweed).

■Certification for Urban Development/Environment Creation with consideration for biodiversity

- ABINC certification system (Certification body:ABINC（Association for Business Innovation in harmony with Nature and Community）)

ABINC certification mainly evaluates and certifies the area, quality and form of the green space within corporate premises that will contribute to the biodiversity, sustainable maintenance and management of the green space and communication with stakeholders through utilization of the green space. Certification is given in relation to urban development, shopping centers, manufacturing plants, apartment houses, housing estates with detached houses, logistics facilities and city blocks.

- SEGES Certification System (Social and Environmental Green Evaluation System) (Certification body: SEGES Evaluation and Certification Committee)

SEGES stands for Social and Environmental Green Evaluation System. This is a certification system for greenery projects owned and created by companies that contribute to society and the environment, such as the mitigation of global warming and heat island phenomena, conservation of local ecosystems, conservation and creation of good landscapes, community building with local communities, and the development of safe and secure urban areas. If the evaluation regarding the environmental performance items can be confirmed in the total evaluation, it is considered to be effective as an environmental certification.

- SITES Certification System (Certification body: Green Business Certification Inc.(GBCI)

Abbreviation for the Sustainable SITES Initiative. SITES is a certification system that comprehensively evaluates the sustainability of the landscape certified by the U.S. Green Business Certification Inc.(GBCI.) The ratings are on a four-point scale, from SITES Platinum to SITES Certified. From the initial stage of the plan to design, construction, operation, and management stages, the entire project is evaluated, and biodiversity conservation, water resource conservation, energy conservation, resource circulation, heat island phenomenon mitigation, health promotion, education, etc. are considered as evaluation viewpoints. If the evaluation regarding the environmental performance items can be confirmed in the total evaluation, it is considered to be effective as an environmental certification.

Annex 2 Possible examples of negative environmental impacts

The following is not an exhaustive list and only shows some of the examples. These are major examples of potential negative impacts on the environment. Some projects may have other negative environmental impacts and there could even be negative social impacts. Therefore, it is important that each project is individually examined.

1) Projects for renewable energy

Possible Projects	Possible negative impacts on the environment
Solar power generation projects	✓Ecological disruption or adverse effects on ecosystems caused by massive land development ✓Outflow of muddy water ✓Spilling of soil such as topsoil ✓Light pollution and adverse effects on scenery ✓Noise and vibration from the relevant facilities, and so on
Wind power generation projects	✓Adverse effects on ecosystems (such as bird strikes) ✓Low-frequency noise and vibration ✓Adverse effects on the scenery, and so forth
hydroelectric power generation projects	✓Adverse effects on and destruction of ecosystems entailing large-scale land development (e.g. disturbing the upstream migration of fish), and so forth
Biomass power generation projects	✓Increase in GHG emission in the overall lifecycle of biomass fuel ✓Air pollution caused by emissions from facilities and vehicles carrying biomass fuel ✓Adverse effects on environment at fuel-producing areas such as illegal logging, development of peatland and indirect land use change ✓Water pollution due to drainage from facilities ✓Adverse effects on ecosystems due to waste heat generation ✓Noise, and so forth
Geothermal power generation projects	✓Adverse effects on ecosystems due to large-scale land development ✓Air pollution from toxic volatile substances ✓Adverse effects on the scenery, and so forth
Projects to install, manage, and maintain power lines that transmit electricity generated by renewable energy and batteries that store the electricity, adjust to demand and supply, and store energy	✓Adverse effects on ecosystems (cases where power lines and batteries are installed in natural reserves, etc.), and so on
Projects to manufacture appliances and products used in the aforementioned projects, such as solar panels, power lines, and batteries	✓Release of toxic chemicals produced in the production process of equipment into the environment, and so on
Projects that engage in renewable energy-derived heat utilization, such as solar heat and geothermal heat	✓Adverse effects on ecosystems due to changes in the temperature and quality of groundwater and soil, and so on

2) Projects for energy efficiency

Possible Projects	Possible negative impacts on the environment

Projects for the construction of new ZEH, ZEB, and other highly energy efficient buildings	✓Noise and vibration associated with construction ✓Adverse effects on the surrounding environment such as light pollution, and so on
Projects for the renovation of offices, manufacturing plants, and houses for better energy efficiency to obtain an environmental certification	✓Noise and vibration associated with construction ✓Dispersal of hazardous wastes such as asbestos, and so on
Projects to introduce highly energy efficient equipment and facilities into offices, plants, and houses	✓Adverse effects arising from inappropriate disposal of old equipment and facilities, and so on
Projects for the development and introduction of smart grids	✓Noise and vibration associated with construction, and so on

3) Projects for pollution prevention and control

Possible Projects	Possible negative impacts on the environment
Projects that contribute to the realization of a circular economy	✓Adverse effects due to the dispersion and release of toxic chemicals ✓Air pollution resulting from waste disposal and water contamination due to wastewater ✓Increased environmental load over lifecycle due to inefficient recycling practices, and so on
Projects to control the release of toxic chemicals into the environment by preventing their leakage, volatilization, and infiltration	✓Adverse effects arising from the inappropriate disposal of toxic chemicals ✓Adverse effects arising from the release of alternative substances into the environment, and so on
Projects to prevent the release of fluorocarbons into the atmosphere, to collect and to destroy fluorocarbons	(Take careful note of whether adverse environmental effects likely to occur depending on the projects)
Projects to build facilities that contribute to the advanced treatment and recycling of wastewater from manufacturing plants, etc.	✓Adverse effects arising from the inappropriate disposal of sludge containing toxic chemicals such as heavy metals, and so on
Projects for the treatment of polluted soil	✓Adverse effects arising from the inappropriate disposal of polluted soil ✓Air pollution from gas emissions and water contamination from wastewater, which are associated with the disposal of polluted soil, and so on

4) Projects for the sustainable management of living natural resources

Possible Projects	Possible negative impacts on the environment
- Projects to acquire sustainable fishery and aquaculture certifications such as the MSC (Marine Stewardship Council) and ASC (Aquaculture Stewardship Council) certifications	(Take careful note of whether adverse environmental effects likely to occur depending on the projects)
Projects to acquire sustainable forestry certifications such as the FSC (Forest Stewardship Council) certification	(Take careful note of whether adverse environmental effects likely to occur depending on the projects)

5) Projects for biodiversity conservation

Possible Projects	Possible negative impacts on the environment
Projects for the conservation of wetlands and coral reefs through such measures as improvement of water quality	✓Adverse effects on ecosystems due to large-scale land development ✓Disturbance to gene pool in the target area, and so on
Projects to control bird or animal damage and non-native species to prevent damage inflicted to the ecosystem by deer and other birds and animal or non-native species	✓Adverse effects on ecosystem such as lead poisoning of wild birds caused by lead bullets used in controlling birds and animals

	✓Adverse effects on ecosystem caused by scattering of seeds when removing non-native plants, and so on.
Projects for the transformation of river walls into more natural forms	✓Adverse effects on ecosystems due to large-scale land development, and so on

6) Projects for clean transportation

Possible Projects	Possible negative impacts on the environment
Projects for the development and manufacture of low-emission electric and hydrogen vehicles, and the development and maintenance of infrastructure for using such vehicles	✓Adverse effects on ecosystems due to large-scale land development ✓Adverse effects on the environment arising from the inappropriate mining, use and disposal of metal including rare metal, and so on
Projects to enhance the efficiency of logistics systems by the systematic installation of logistics bases, aggregation of transportation networks, modal shifts, and coordinated transportation and delivery.	✓Adverse effects on ecosystems due to large-scale land development ✓Increase in noise, vibration and air pollution, etc. due to concentration of transport system or operation in a specific location or during specific hours, and so on
Projects to introduce devices (such as digital tachographs) to support eco-driving	(Take careful note of whether adverse environmental effects likely to occur depending on the projects)
Projects for the development of facilities for park-and-ride and car-sharing systems	✓Noise and waste around project sites, and so on

7) Projects for sustainable water resources management

Possible Projects	Possible negative impacts on the environment
Projects to conserve the water circulation cycle such as water source protection and penetration of rainwater into soils	✓Adverse effects on ecosystems due to large-scale land development ✓Introduction of non-native species or other inappropriate plants, and so on
Projects to develop and improve flood prevention facilities	✓Adverse effects on ecosystems due to large-scale land development, and so on
Projects for seawater desalination	✓Adverse effects on ecosystems due to the release of concentrated water ✓Adverse effect of global warming caused by use of equipment and methods with poor energy efficiency, and so forth

8) Projects for climate change adaptation

Possible Projects	Possible negative impacts on the environment
Projects to reinforce disaster prevention functions of logistics, railways, ports, airports, roads, water supply infrastructure, waste disposal facilities, traffic safety facilities, and private real estate	✓Adverse effects on ecosystems due to large-scale land development, and so on

9) Projects for eco-efficient products, manufacturing technologies, and processes

Possible Projects	Possible negative impacts on the environment
Projects to manufacture products that meet the requirements of environmental certifications	✓Adverse effects on ecosystems due to large-scale land development ✓Leakage of hazardous materials used in the manufacturing processes of the products ✓Adverse effects on the environment arising from the inappropriate mining, use and disposal of metal including rare metal, and so on

Projects for the research, development, and introduction of technology and products that contribute to reducing the amount of GHGs	✓Adverse effects on ecosystems due to large-scale land development ✓Leakage of hazardous materials used in the production process, and so on

Annex 3 Examples of disclosure information[22]

The following is not an exhaustive list and only shows some of the examples.

1) Examples of information disclosure by Green Projects

Project category	Possible Projects	Outline	Progress	Amount of proceeds allocated	Environmental benefits
Projects for renewable energy	Wind power generation	Project to construct wind power facilities, generate power at the facilities, and sell electricity through feed-in tariffs (FIT)	Under construction (To start operations in MM/YYYY)	XXX million yen	Amount of CO_2 reduced ZZ t-CO_2/year
Projects for pollution prevention and control	Recycling of waste	Project to construct fuel manufacturing facilities and manufacture fuel via waste recycling	Construction to start in MM/YYYY	YYY million yen	Reduction in the waste incinerated: XX t/year
Projects for the sustainable management of living natural resources	Planting	Project to plant trees to conserve and recover ecosystems in the XX region	Completed	XXX million yen	Area of forests regenerated by planting: X ha
Total				XXX million yen	

*The currently unallocated proceeds (XXX million yen) will be allocated in MM and M'M'/YYYY along with the progress of the construction of the waste recycling facilities. Until then, the unallocated proceeds will be managed as cash or cash equivalents.

*The following are the details of each project. (omitted)

2) Example of information disclosure (aggregated information) by category

Project category	Possible Projects	Number of projects	Amount allocated	Environmental benefits (CO_2 reduction)
Projects for renewable energy	Solar power generation	XX	YYY million yen	ZZ t-CO_2/year
	Wind power generation	XX	YYY million yen	ZZ t-CO_2/year
	Manufacture of batteries	XX	YYY million yen	ZZ t-CO_2/year
	Subtotal	XX (Refinancing: xx)	YYY million yen (Refinancing: xxx million yen)	ZZ t-CO_2/year
Projects for energy efficiency	Construction of new energy efficient buildings	YY	YYY million yen	ZZ t-CO_2/year
	Renovation of buildings for better energy efficiency	YY	YYY million yen	ZZ t-CO_2/year
	Subtotal	YY (Refinancing: YY)	YYY million yen (Refinancing:	ZZ t-CO_2/year

[22] 'Handbook – Harmonized Framework for Impact Reporting' and 'Guidance Handbook June 2019' by ICMA provides guidance on indicators and calculation methodologies for expected environmental benefits.

			YYY million yen)	
Projects for eco-efficient products, manufacturing technologies, and processes	Manufacturing of products that meet the requirements of environmental certifications	XX	YYY million yen	ZZ t-CO_2/year XX t/year
	Subtotal	XX (Refinancing: ZZ)	YYY million yen (Refinancing: ZZ million yen)	ZZ t-CO_2/year
	Total	XX (Refinancing: ZZ)	XXX million yen (Refinancing: ZZ million yen)	ZZ t-CO_2/year
	Unallocated proceeds (managed via short-term financial assets)		YYY million yen	

*The following are a few examples of typical projects. (omitted)

Annex 4 Examples of specific indicators

The following is not an exhaustive list and only shows some of the examples.

Project category	Index examples	Details
Projects for renewable energy	CO2 emissions reduced (t-CO2)	Calculate by comparing the estimated CO2 emissions (t-CO2) when the project is not implemented and after the project is implemented
	Amount of power generated by renewable energy (GWh)	Amount of power generated by renewable energy at facilities constructed through the project (GWh)
	Rate of use renewable energy in the manufacturing process (%)	Compare the rate of use of renewable energy in the manufacturing process (percentage of renewable energy consumption in total energy consumption) before and after the implementation of the project
Projects for energy efficiency	CO2 emissions reduced (t-CO2)	Calculate by multiplying the amount of energy reduced by the project (kL) and CO2 emission coefficient (t-CO2/kL)
	Amount of energy consumption reduced (kL, t, m3, MWh)	Calculate by comparing the estimated energy consumptions (kL) when the project is not implemented and after the project is implemented.
	Number of environmental certifications obtained	The number of environmental certifications, such as LEED, CASBEE, and BELS, that were obtained for buildings involved in the project
	Number of energy-saving facilities and products introduced	The number of energy-saving facilities (e.g. freezers and refrigerators switched from HFC to non-chlorofluorocarbon) and energy-saving products.
Projects for pollution prevention and control	Amount of air pollutants reduced	Amount of air pollutants (sulfur oxide (SOx), nitrogen oxide (NOx), and particulate matter) emissions in to the air reduced by the implementation of the project (t)
	Amount of water pollutants reduced	Amount of water pollutants (chemical oxygen demand and biochemical oxygen demand (BOD)) discharge into public waters reduced by the project implementation (t)
	Quantity of chemical substance emissions controlled (P)	Under consideration
	Amount of landfill waste reduced (t)	Amount of landfill waste reduced by project implementation (t)
	Amount of materials that reduce environmental loads (t)	Amount of materials such as recycled materials and renewable resources that reduce environmental loads being used (t)
	Amount of waste recycled (t)	Amount of waste recycled (t)
	Amount of waste generated (%)	Change in the amount of waste generated before and after the implementation of project

Projects for sustainable management of natural resources and land use	Area of a forest managed in a sustainable manner (ha)	Area of a forest managed in a sustainable manner(ha)
	Area where improvements have been made on urban environments in response to climate change, for biodiversity, etc. （m^2）	Area where improvements have been made on urban environments in response to climate change, for biodiversity, etc., such as improvements in vegetation or ground surface in urban development （m^2）
Projects for biodiversity conservation	Area of healthy coral conserved by water quality improvement project (ha)	Area of healthy coral, which hasn't been whitened, conserved by projects of water quality improvement, etc. (ha)
	Total distance of river banks restored similar to natural shape by projects (km)	Total distance of river banks restored similar to natural shape by projects (km)
	Acquisition of certificate for biodiversity-friendly urbanization and creation of environment	The number of ABINC and JHEP (Japan Habitat Evaluation and Certification Program) certificates acquired or the area
	Acquisition of certificates for biodiversity and ecosystem	The number of MSC and ASC certificates acquired or the amount of certified marine fishery products being handled
	Ecosystem conservation area (ha)	Area of ecosystem conservation through biodiversity conservation projects and products and services sold (ha)
	Conservation and amount used of bio-resources (t)	Amount of bio-resources conserved and used through products and services sold (t)
	Number of endangered species recovered	Number of endangered species recovered through conservation by biodiversity conservation projects and sales of products and services (population)
	Amount improved in ecological footprint (ha) of products and services contributing to conservation of biodiversity conservation	Ecological footprint (ha; amount of demand of ecosystem service, required for producing resources to be consumed and absorbing CO2 emitted in socio-economic activities, expressed in terms of the earth's area) improved through biodiversity conservation projects and products and services sold.
Projects for clean transportation	CO2 emissions reduced (t-CO2)	Calculate by comparing the estimated CO2 emissions (t-CO2) when the project is not implemented and after the project is implemented

	Percentage of next-generation vehicles (%)	Percentage of next-generation vehicles in the total number of new vehicles sold (%)
	Passenger transport capacity	Number of passengers (people) × Distance (km) and/or Number of passengers or Total traffic volume (t) × Distance (km) and/or Total traffic volume (t)
	Fuel consumption performance	Estimated reduction in fuel consumption
	Change in traffic volume	Changes in automobile traffic and rail traffic volume
Projects for sustainable water resources management	Area of wetted surface reduced (ha)	Reduction in the estimated area of wetted surface in the event of heavy rain from the implementation of the project (ha)
	Number of beneficiaries (persons/households)	Number of persons/households that gain access to water through the project implementation
	Annual water conservation (m3)	Total amount of annual water use (m3) before and after the project and the rate of reduction in water use (%) before and after the project
	Effluent treatment efficiency	The amount of effluent treatment before and after the project and reused amount or amount contributed to reduction (m3/a) and ratio of contribution to reduction (%)
Projects for climate change adaptation	Area of a forest or a watershed managed in a sustainable manner (ha)	Area of a forest or a watershed managed in a sustainable manner (ha)
	Area of wetted surface reduced (ha)	Reduction in the estimated area of wetted surface in the event of heavy rain from the implementation of the project (ha)
Projects for eco-efficient products, manufacturing technologies, and processes	Reduction in CO2 emissions per ton of products (t-CO2/t)	Calculate by comparing CO2 emissions/ton of products (CO2 emissions (t-CO2) ÷ production volume (t)) before and after the implementation of the project
	Amount of materials with environmental load reducing effect used (t)	The amount of recycled materials and renewable resources with environmental load reducing effect used (t)
	Amount of raw materials reduced (t)	Calculate by comparing the raw materials used (t) before and after the implementation of the project
Projects for green buildings	Energy efficiency (kWh/m2 of GBA)	Annual energy usage per total floor area, ratio of energy usage reduction or ratio of contribution to reduction (%), ratio of power generated using renewable energy at the concerned facility to energy consumption (%)
	Carbon performance	Annual CO2 emission per total floor space (kgCO2/m2), annual reduction/contribution to reduction of GHG emissions (in terms of CO2), annual reduction/contribution to reduction of carbon emission (%)
	Water resource utilization ratio	Annual water resource consumption per total floor space (m3/m2), annual total water consumption before and after the project (m3) or reduction in water consumption before and after the project (%), amount of rain water collected and the amount of recycled rain water (m3/a)

	Waste management	Minimization of waste in total volume of annual waste, ratio of annual reused or recycled amount (%) and/or minimization of waste, annual reused and recycled amount (t)
	Number of certificates acquired	Types and evaluation of certificates acquired such as LEED

Annex 5 Examples of how to calculate environmental benefits

The following is not an exhaustive list and only shows some of the examples. Since each method is simplified to facilitate easy understanding, it should be noted that it may not be appropriate to apply these methods without modification in individual projects depending on individual businesses.

1. Cases where the reduction in CO2 emissions serves as an indicator of environmental benefits from solar power generation projects	
Precondition	Use the average CO2 emissions coefficient from all power sources at a project site as an electricity-related CO2 emissions coefficient. For instance, when the project site is in the area serviced by Shikoku Electric Power Company, the emissions coefficient is 0.500 t-CO2/MWh. (“CO2 emissions coefficients by power companies-FY2020 Results-” (Posted on the official website of the Ministry of the Environment)) *Calculation to be based on most recent CO2 emissions coefficient - Annual energy generation: 2,000 MWh/year - Annual power consumption by auxiliary equipment: 10 MWh/year
Calculation method referenced	Operation rules of the certification system of CO2 emissions reduction through the use of Green Energy (Posted on the official websites of Agency for Natural Resources and Energy and Ministry of the Environment)
Calculation formula	(2,000 MWh/year - 10 MWh/year) x 0.500 t-CO2/MWh = 995 t-CO2/year Reduction in CO2 emissions = (annual energy generation - annual power consumption by auxiliary equipment) x electricity-related CO2 emissions coefficient
2. Cases where the reduction in CO2 emissions serves as the indicator of environmental benefits from wind power generation projects	
Precondition	Use the average CO2 emissions coefficient from all power sources at a project site as an electricity-related CO2 emissions coefficient. For instance, when the project site is in the area serviced by Tokyo Electric Power Company, the CO2 emissions coefficient will be 0.468 t-CO2/MWh. (“CO2 emissions coefficients by power companies-FY2020 Results-” (Posted on the official website of the Ministry of the Environment)) *Calculation to be based on most recent CO2 emissions coefficient - Annual energy generation: 3,000 MWh/year - Annual power consumption by auxiliary equipment: 10 MWh/year
Calculation method referenced	Operation rules of the certification system of CO2 emissions reduction through the use of Green Energy (Posted on the official websites of Agency for Natural Resources and Energy and Ministry of the Environment)
Calculation formula	(3,000 MWh/year - 10 MWh/year) x 0.468 t-CO2/MWh = 1,399 t-CO2/year Reduction in CO2 emissions = (annual energy generation - annual power consumption by auxiliary equipment) x electricity-related CO2 emissions coefficient
3. Cases where the reduction in CO2 emissions serves as the indicator of environmental benefits from woody biomass power generation projects	
Precondition	Use the average CO2 emissions coefficient from all power sources at a project site as an electricity-related CO2 emissions coefficient. For instance, when the project site is in the area serviced by Kyushu Electric Power Company, the CO2 emissions coefficient is 0.319 t-CO2/MWh. (“CO2 emissions coefficients by power companies-FY2020 Results-” (Posted on the official website of the Ministry of the Environment)) *Calculation to be based on most recent CO2 emissions coefficient - Annual energy generation: 20,000 MWh/year - Annual power consumption by auxiliary equipment: 300 MWh/year

Calculation method referenced	Operation rules of the certification system of CO2 emissions reduction through the use of Green Energy (Posted on the official websites of Agency for Natural Resources and Energy and Ministry of the Environment)
Calculation formula	(20,000 MWh/year - 300 MWh/year) x 0.319 t-CO2/MWh = 6,284 t-CO2/year Reduction in CO2 emissions = (annual energy generation - annual power consumption by auxiliary equipment) x electricity-related CO2 emissions coefficient
4. Cases where the reduction in CO2 emissions serves as the indicator of environmental benefits from small and medium hydroelectric power generation projects	
Precondition	Use the average CO2 emissions coefficient from all power sources at a project site as an electricity-related CO2 emissions coefficient. For instance, when the project site is in the area serviced by Hokkaido Electric Power, the emissions coefficient is 0.643t-CO2/MWh. (“CO2 emissions coefficients by power companies-FY2020 Results-” (Posted on the official website of the Ministry of the Environment)) - Annual energy generation: 10,000 MWh/year - Annual power consumption by auxiliary equipment: 100 MWh/year
Calculation method referenced	Operation rules of the certification system of CO2 emissions reduction through the use of Green Energy (Posted on the official websites of Agency for Natural Resources and Energy and Ministry of the Environment)
Calculation formula	(10,000 MWh/year - 100 MWh/year) x 0.643 t-CO2/MWh = 6,366 t-CO2/year Reduction in CO2 emissions = (annual energy generation - annual power consumption by auxiliary equipment) x electricity-related CO2 emissions coefficient
5. Cases where the reduction in CO2 emissions serves as the indicator of environmental benefits from geothermal power generation projects	
Precondition	Use the average CO2 emissions coefficient from all power sources at a project site as an electricity-related CO2 emissions coefficient. For instance, when the project site is in the area serviced by Tohoku Electric Power, the emissions coefficient is 0.522 t-CO2/MWh. (“CO2 emissions coefficients by power companies-FY2020 Results-” (Posted on the official website of the Ministry of the Environment)) *Calculation to be based on most recent CO2 emissions coefficient - Annual energy generation: 80,000 MWh/year - Annual power consumption by auxiliary equipment: 900 MWh/year
Calculation method referenced	Operation rules of the certification system of CO2 emissions reduction through the use of Green Energy (Posted on the official websites of Agency for Natural Resources and Energy and Ministry of the Environment)
Calculation formula	(80,000 MWh/year - 900 MWh/year) x 0.522 t-CO2/MWh = 41,290 t-CO2/year Reduction in CO2 emissions = (annual energy generation - annual power consumption by auxiliary equipment) x electricity-related CO2 emissions coefficient
6. Cases where the reduction in CO2 emissions of the entire building serves as the indicator of environmental benefits in projects to introduce energy efficient appliances and cogeneration systems into buildings	
Precondition	<Precondition> - Steam is produced by a city gas boiler while electricity is purchased - Annual power consumption: 2,500 MWh/year - Annual city gas consumption: 356,000 Nm3/year <After introduction> - Some of the appliances are changed to energy efficient equipment

	- City gas boilers are removed and a city gas cogeneration system is introduced. All steam produced by boilers is now produced by the cogeneration system. Part of the electric power purchased is replaced by power generated by the cogeneration system. - Annual power consumption: 500 MWh/year - Annual city gas consumption: 200,000 Nm^3/year - Unit calorific value of city gas: 44.8 GJ/1000 Nm^3 - City gas-related carbon emission coefficient: 0.0136 tC/GJ - Annual energy generation: 2,000 MWh/year Use the average CO2 emissions coefficient from all power sources at a project site as CO2 emissions coefficient for electricity. For instance, when the project site is in the area serviced by Tokyo Electric Power Company, the emissions coefficient is 0.468 t-CO2/MWh. ("CO2 emissions coefficients by power companies-FY2020 Results-" (Posted on the official website of the Ministry of the Environment)) *Calculation to be based on most recent CO2 emissions coefficient
Calculation method referenced	"Manual for the Calculation and Reporting of Greenhouse Gas Emissions (ver. 4.2), Second Edition: Methods to calculate greenhouse gas emissions" (Posted on the official website of the Ministry of the Environment)
Calculation formula	(2,500 MWh x 0.468 t-CO2/MWh + 356,000 Nm^3 x 44.8 GJ/1000 Nm^3 x 0.0136 tC/GJ x 44/12) - (500 MWh x 0.468 t-CO2/MWh + 200,000 Nm3 x 44.8 GJ/1000 Nm^3 x0.0136 tC/GJ x 44/12) = 1348.5 t-CO2/year Reduction in CO2 emissions = (annual power consumption before renovation x power drain coefficient + annual city gas consumption before renovation x unit city gas calorific value x city gas carbon emissions coefficient x 44/12) - (annual power consumption after renovation x power drain coefficient + annual city gas consumption after renovation x unit city gas calorific value x city gas carbon emissions coefficient x 44/12) *44/12 is a coefficient to convert the amount of carbon emissions to the amount of CO2 emissions.
7. Cases where the reduction in the BOD load serves as the indicator of environmental benefits from projects to renovate facilities to treat effluent discharged from plants into public water bodies	
Precondition	- Average volume of wastewater discharged per day: 1,000 m^3/day - Annual average BOD of effluent discharged from effluent treatment facilities: 20 mg/L (before project implementation) → 10 mg/L (after project implementation) - Number of days plants operated per year: 365 days
Calculation method referenced	Environmental Reporting Guidelines (2012) (Posted on the official website of the Ministry of the Environment)
Calculation formula	(20 mg/L - 10 mg/L) x 1/1,000,000 (unit conversion mg → kg) x 1,000 (m^3/day) x1,000 (unit conversion m^3 → L) x 365 (days/year) = 3,650 kg/year Reduction in BOD load = (annual average BOD of effluent before the renovation of effluent treatment facilities - annual average BOD of effluent after the renovation of effluent treatment facilities) x average amount of effluent per day x number of days plants operated per year
8. Cases where the amount of carbon absorbed by trees serves as the indicator of environmental benefits from planting projects	
Precondition	- Target area: 200 ha - Final cutting area per year: 2 ha - Annual amount of growth: 2.9 m^3/ha/year - Target: Cedar

	(Magnification coefficient: 1.23, ratio of the above-ground part to the under-ground part: 0.25, bulk density: 0.3140 t/m^3, carbon content: 0.5) - The land use category before tree planting was agricultural land (general farm land) and the baseline amount of carbon absorbed was 0 t-CO2/year. (“National Greenhouse Gas Inventory Report of JAPAN, April 2016 edition” posted on the official website of National Institute for Environmental Studies)
Calculation method referenced	“How to view the carbon absorbed by forests: Development of calculation and reporting systems for carbon absorption by forests as required by the Kyoto Protocol” (Posted on the official websites of the Ministry of Agriculture, Forestry and Fisheries and the Forestry and Forest Products Research Institute)
Calculation formula	[(2.9 m3/ha/year x (200-2 ha)) x 1.23 x (1 + 0.25) x 0.3140 t/m3 x 0.5] - 0 = 139 t-C/year [Annual carbon absorbed at a planting site = an increase in trunk volume x magnification coefficient x (1 + ratio of the above-ground part to the under-ground part) x bulk density x carbon content] - annual baseline amount of carbon absorbed When converting the amount of carbon to the weight of carbon dioxide, multiply the above formula by 44/12.
9. Cases where the reduction in CO2 emissions serves as the indicator of environmental benefits from cargo transport projects concerning a modal shift from road to rail transport	
Precondition	- Annual total volume of cargo transport: 8,000,000 tkm/year - Basic unit of CO2 emissions for cargo vehicles: 0.211 kg-CO2/tkm - Basic unit of CO2 emissions for freight railways: 0.025 kg-CO2/tkm (Posted on the official website of the Ministry of Land, Infrastructure, Transport and Tourism)
Calculation method referenced	“Joint guidelines on methods for calculating carbon dioxide emissions in the logistics sector” (Posted on the official websites of the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism)
Calculation formula	8,000,000 tkm/year×(0.211 kg-CO2/tkm－0.025 kg-CO2/tkm)×1/1,000（unit conversion kg→t） ＝1,488 t-CO2/year CO2 emission reduction = Annual total volume of cargo transport x (basic unit of CO2 emissions for cargo vehicles - basic unit of CO2 emissions for freight railways)
10. Cases where the reduction in CO2 emissions by electric cars compared to gasoline cars serves as the indicator of environmental benefits from projects to offer loans to new purchasers of electric cars	
Precondition	- Number of cars targeted for loans: 1,000 - Average fuel economy of gasoline cars: 21.8 km/L (Posted on the official website of the Ministry of Land, Infrastructure, Transport and Tourism) - Annual average mileage of gasoline cars (private cars): 10,000 km/year (Posted on the official website of the Ministry of Land, Infrastructure, Transport and Tourism) - Unit calorific value of gasoline: 34.6 MJ/L - Gasoline-related carbon emission coefficient: 0.0183 kg-C/MJ (“Manual for the Calculation and Reporting of Greenhouse Gas Emissions (ver. 4.2), Second Edition: Methods to calculate greenhouse gas emissions” Posted on the official website of the Ministry of the Environment) - Electric power consumption by electric cars to be introduced: 6 km/kWh Use the average CO2 emissions coefficient from all power sources at a project site as an electricity-related CO2 emissions coefficient. For instance, when the project site is in the area serviced by Tokyo Electric Power Company, the emissions coefficient is 0.468 t-CO2/MWh. (“CO2 emissions coefficients by power companies-FY2020 Results-” (Posted on the official website of the Ministry of the Environment)) *Calculation to be based on most recent CO2 emissions coefficient

Calculation method referenced	“Joint guidelines on methods for calculating carbon dioxide emissions in the logistics sector” (Posted on the official websites of the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism)
Calculation formula	{(1,000 vehicles×10,000 km/year)/21.8 km/L}×34.6 MJ/L×0.0183 kg-C/MJ×44/12 ×(1/1,000（unit conversion kg → t)) - {(1,000 unit×10,000 km/year)/6 km/kWh}×0.468 t-CO2/MWh ×(1/1,000（unit conversion MWh → kWh))＝285 t-CO2/year Reduction in CO2 emissions = (((number of cars targeted for loans x annual average mileage (km/year)) ÷ fuel economy of gasoline cars) x unit calorific value of gasoline x gasoline carbon emission coefficient x 44/12) - ((number of cars targeted for loans x annual average mileage (km/year)) ÷ electric power consumption of electric cars x electricity-related CO2 emissions coefficient) *44/12 is a coefficient to convert the amount of carbon emissions to the amount of CO2 emissions.
11. Cases where a decrease in the estimated wetted surface area and estimated number of affected houses are used as indicators of environmental benefits from projects to construct discharge channels to control submergence in the event of river flooding, which are conducted as part of a climate change adaptation project	
Precondition	- Estimated wetted surface area: about 100 ha (before construction) → about 25 ha(after construction) - Estimated number of affected houses: about 500 houses (before construction) →about 95 houses (after construction)
Calculation method referenced	None. * Refer to the following for the mapping method of assumed flood prone areas “Preparation Manual of the Notional Flooded Areas (Ver. 4)” (Posted on the official website of the Ministry of Land, Infrastructure, Transport and Tourism) “Preparation Manual of the Expected Flooding of Small and Medium Rivers” (Posted on the official website of the Ministry of Land, Infrastructure, Transport and Tourism)
Calculation formula	A decrease in flooded area = estimated wetted surface area before construction - estimated wetted surface area after construction = about 100 ha - about 25 ha = about 75 ha Estimated decrease in the number of affected houses = estimated number of affected houses before construction - estimated number of affected houses after construction = about 500 houses - about 95 houses = about 405 houses
12. Cases where the reduction in CO2 emissions per ton of products serves as the indicator of environmental benefits from projects to enhance energy efficiency of the manufacturing process in plants	
Precondition	- Annual product production volume: 15,000 t/year Use the average CO2 emissions coefficient from all power sources at a project site as an electricity-related CO2 emissions coefficient. For instance, when the project site is in the area serviced by Hokkaido Electric Power, the emissions coefficient is 0.643t-CO2/MWh. (“CO2 emissions coefficients by power companies-FY2020 Results-” (Posted on the official website of the Ministry of the Environment)) *Calculation to be based on most recent CO2 emissions coefficient - Annual power consumption: 5,000 MWh/year (before renovation) → 4,000 MWh/year (after renovation) - Annual A-type heavy oil consumption: 800 kL/year (before renovation) → 600kL/year (after renovation) - Unit calorific value of A-type heavy oil: 39.1 GJ/kL A-type heavy oil-related carbon emission coefficient: 0.0189 tC/GJ

Calculation method referenced	“Manual for the Calculation and Reporting of Greenhouse Gas Emissions (ver. 4.2), Second Edition: Methods to calculate greenhouse gas emissions” (Posted on the official website of the Ministry of the Environment)
Calculation formula	(5,000MWh×0.643t-CO2/MWh＋800kL×39.1GJ/kL×0.0189tC/GJ×44/12)/15,000t －(4,000MWh×0.643t-CO2/MWh＋600kL×39.1GJ/kL×0.0189tC/GJ×44/12)/15,000t ＝0.08t-CO2/t Amount of basic unit reduced (reduction in CO2 emissions per ton of products) = (annual power consumption before renovation x power drain coefficient + annual A-type heavy oil consumption before renovation x unit calorific value of A-type heavy oil x A-type heavy oil-related carbon emission coefficient x 44/12) ÷ annual product production volume–(annual power consumption after renovation x power drain coefficient + annual A-type heavy oil consumption after renovation x unit calorific value of A-type heavy oil x A-type heavy oil-related carbon emission coefficient x44/12) ÷ annual product production volume *44/12 is a coefficient to convert the amount of carbon emissions to the amount of CO2 emissions.
13. Cases where a reduction in the amount of plastics used serves as the indicator of environmental benefits from projects to introduce equipment to produce packaging materials with fewer plastics at packaging manufacturing plants	
Precondition	- Amount of plastics used per packaging material (unit index that is 100% before introduction): 100% (before introduction) → 60% (after introduction) - The current amount of plastics used to produce 100,000 packaging materials (before introduction): 5 tons
Calculation method referenced	None.
Calculation formula	A reduction in the amount of plastics used to produce 100,000 packaging materials = 5 tons x (100% - 60%) = 2 tons
14. Cases where the absorption amount of greenhouse gases as a result of greening serves as the indicator for environmental benefits from projects for absorption by urban greening	
Precondition	- To account for the absorption amount of greenhouse gases by the greening of the project site (planting of tall trees)
Calculation method referenced	‘Low Carbon City Planning Practical Handbook (Resources)’ (Ministry of Land, Infrastructure, Transport and Tourism, City Bureau, City Planning Division) p. 18-19
Calculation formula	(Regions other than Hokkaido Prefecture) CO2 absorption (t-CO2/year) =0.0385 (t-CO2/per tree per year) x number of tall trees (trees) (Hokkaido Prefecture) CO2 absorption (t-CO2/year) =0.0359 (t-CO2/per tree per year) x number of tall trees (trees) If the number of tall trees are unknown within the project site, calculation based on area is also possible as an alternative. Refer to the ‘Low Carbon City Planning Practical Handbook (Resources)’ for details.