NEWS RELEASE

JCR Sustainable Evaluation

24-D-0240
May 31, 2024

Japan Credit Rating Agency, Ltd. (JCR) announces the following preliminary Climate Transition Bond Evaluation Results.

The Government of Japan

Japan Climate Transition Bond (FY2024) — Assignment

Overall Preliminary Evaluation	Greenness/ Transition Preliminary Evaluation (Use of Proceeds)	Management, Operation and Transparency Preliminary Evaluation
Green 1(T)	gt1	m1

Issuer	The Government of Japan
Subject	10-year Japan Climate Transition Bonds (2nd)※ 5-year Japan Climate Transition Bonds (2nd)
Type	interest-bearing government bonds
Issue Amount	10-year bonds: face value of approximately JPY 350 billion for two times※ 5-year bonds: face value of approximately JPY 350 billion for two times Total: approximately JPY 1.4 trillion
Interest Rate	to be decided
Auction Date	10-year bond: May 28, 2024, October 2024 5-year bond: July 18, 2024, January 2025
Redemption Date	10-year bond: May 20, 2034 (TBD) 5-year bond: July 20, 2029 (TBD)
Method of Redemption	Lump-sum redemption at maturity
Use of Proceeds	Projects that meet the eligibility criteria identified in the Climate Transition Bond Framework based on the GX Promotion Strategy

※ 10-year Japan Climate Transition Bonds (2nd) which was auctioned on May 28, 2024. JCR has already published Climate Transition Evaluation Results on the same day (24-D-0291).

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Evaluation Overview

1. Overview of Japan

Japan is located off the coast of the Far East and East Asia at the eastern tip of the Eurasian continent, and along the northwest coast of the Pacific Ocean, forming an arcuate archipelago as a whole. Approximately 70 per cent of Japan's land is mountainous, and approximately 67 per cent of that is forest. Japan is a country that experiences more natural disasters such as earthquakes and typhoons than any other country in the world. 18.5 per cent of earthquakes of magnitude 6 or higher that occur around the world occur in Japan. In addition, Japan accounts for 17.5 per cent of the damage caused by natural disasters including typhoons and earthquakes worldwide. In Japan, natural disasters, which have become increasingly severe in recent years, have caused much damage, including blackouts that lasted for several weeks, and further measures to both mitigate and adapt to climate change have become an urgent and top priority issue.

Japan has many manufacturing industries that are internationally competitive. According to the 2023 White Paper on Manufacturing Industries[1], there were 825 major manufacturing items in 2020, of which 220 items had a global share of 60 per cent or more, making it an overwhelming leader in the world. Approximately 70 per cent of this is used as parts and materials for electronics and automobiles, making this a strength of Japan's manufacturing industry.

The total amount of greenhouse gas (hereinafter referred to as "GHG")[2] emissions in Japan with the thriving manufacturing industry, was 1.135 billion tons-CO_{2e} as of FY2022 that ranked the seventh largest in the world[3]; however, the actual amount in FY2022 was reduced by approximately 19.3 per cent from FY2013. Of which, the total carbon dioxide (hereinafter referred to as "CO_2") emissions amounted to 1.037 billion tons-CO_2 and 92.9 per cent of the emissions are resulting from energy use. The breakdown by sector is as follows: the energy transformation sector, 40.5 per cent; the industrial sector, 24.4 per cent; the transportation sector, 17.8 per cent; the commercial industry, etc. sectors, 5.5 per cent and the residential sector, 4.8 per cent.

2. Overview of Japan's transition strategy

The Government of Japan declared "net-zero by 2050 " in October 2020, based on the goals set out in the Paris Agreement (substantially reduce global greenhouse gas emissions to hold global temperature increase to well below 2°C above pre-industrial levels and pursue efforts to limit it to 1.5°C above pre-industrial levels,) and legalized it by amending the Act on Promotion of Global

[1] Ministry of Economy, Trade and Industry, Ministry of Health, Labor and Welfare, Ministry of Education, Culture, Sports, Science and Technology "2023 White Paper on Manufacturing Industries (Annual report based on Article 8 of Basic Act on the Promotion of Core Manufacturing Technology)" https://www.meti.go.jp/report/whitepaper/mono/2023 /index.html

[2] CO_2, methane, dinitrogen monoxide (nitrous oxide,) hydrofluorocarbons (HFC,) perfluorocarbons (PFC) and sulfur hexafluoride (SF6)

[3] Emissions Database for Global Atmospheric Research(EDGAR) "Emissions Database for Global Atmospheric Research" in 2022 https://edgar.jrc.ec.europa.eu/report_2023

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Warming Countermeasures in 2021. In April 2021, the government expressed that it aimed to reduce GHG by 46 per cent (from FY2013) in FY2030 and continuingly challenge to realize 50 per cent reduction as an interim goal for net-zero by 2050.

As mentioned above, energy-derived CO_2 accounts for a little under 90 per cent of total GHG emissions of Japan. It is therefore significant to steadily take concrete measures for decarbonization in the industry, business, transportation and residential sectors, based on the national energy basic plan and the national energy mix to achieve the 2030 target. The Government of Japan launched GX that is to transform the industrial and social structures from fossil energy-centered since the Industrial Revolution into clean energy-centered in the 6th Strategic Energy Plan decided in the cabinet in October 2021. The government has held the GX Implementation Council, chaired by the Prime Minister and composed of experts from the government, private sector experts and academia since 2023 and compiled Basic Policy for the Realization of GX. The GX Promotion Act and the GX Decarbonization Electricity Act were enacted in 2023, and a system to promote the initiatives toward "Pro-Growth Carbon Pricing (CP) Concepts" was established. "GX Promotion Strategy" was decided in the cabinet in July 2023, based on the GX Promotion Act as a concrete strategy for implementing a series of policies.

The government centered to seek for further energy consumption reduction and for making renewable energy the main power sources as its first prioritized strategy. It then supports to realize the development of next-generation technologies in 22 sectors, including, but not limited to, the maximum utilization of nuclear power or hydrogen/ammonia/carbon recycling.

▶▶▶ 3. Validity on Transition Strategy (Outline of Alignment Evaluation with CTFH)

The Government of Japan's transition strategy and specific policies satisfy the four elements of the Climate Transition Finance Handbook[4] and the Basic Guidelines on Climate Transition Finance[5] (collectively referred to as the CTFH, etc.). The goal set by the Government of Japan to reduce GHG emissions by 46 per cent compared to FY2013 levels in FY2030 meets the goal of limiting global temperature rise to below 2°C as set by the Paris Agreement, but does not meet the goal limiting global temperature rise to 1.5°C or lower. JCR expects the government's further considerations to accelerate its efforts to reach even higher targets which will be enable 1.5°C level rise. JCR evaluates the level of ambition as being relatively ambitious when comparing the target values of other countries with the same base year.

The Government of Japan's transition strategy calls for public and private sectors to invest 150 trillion yen over the next 10 years in order to achieve net-zero by 2050 and the interim milestone goal of FY2030 (46 per cent reduction compared to FY2013). The plan is to go beyond the SDS

[4] International Capital Market Association (ICMA) "Climate Transition Finance Handbook 2023" https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/climate-transition-finance-handbook/

[5] Financial Services Agency, Ministry of Economy, Trade and Industry, Ministry of the Environment "Basic Guidelines on Climate Transition Finance 2021 Edition" https://www.meti.go.jp/press/2021/05/20210507001/20210507001-1.pdf

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scenario (Business As Usual), as the government is planning to attract GX investment by implementing investments stipulated in the Japan Climate Transition Bond Framework in advance. JCR evaluates that this is a highly ambitious strategy, requiring efforts in addition to the BAU.

▶▶▶ 4. Overview of climate transition bond evaluation

The subjects of this evaluation are the 10-year Japan Climate Transition Bonds (2nd) and 5-year Japan Climate Transition Bonds (2nd) to be issued by Japan in FY2024 starting from April 2024 to March 2025 (collectively referred to as the "Japan Climate Transition Bonds (FY2024)" or the "Bonds"). JCR will evaluate whether this Bonds complies with the Green Bond Principles (GBP)[6], Green Bond Guidelines (GB Guidelines)[7], CTFH, etc. Although these are principles or guidelines and are not legally supported regulations, JCR conducts evaluations by referring to the principles and guidelines as currently unified domestic and international standards.

The Government of Japan has established eligibility criteria for the Japan Climate Transition Bond Framework in line with the goals and policies established in the GX Promotion Strategy based on the Plan for Global Warming Countermeasures, the Basic Energy Plan, etc. The projects for which the proceeds of this Bonds will be used are R&D funds and/or subsidy programs selected by the Government of Japan which meets the eligibility criteria set forth in its framework. In addition, although many of the eligible projects are research and development funding and subsidy programs and are unlikely to directly cause serious negative environmental or social impacts, environmental and social considerations should be taken into account when evaluating and selecting individual eligible projects. Based on the above, it is expected that the use of proceeds from this Bonds will promote GX initiatives across Japan and contribute to achieving net-zero by 2050 and its milestone goal in FY2030. Looking at the specific allocation of funds by CO_2 emitting sector, JCR sees that measures are being taken in a well-balanced manner, as shown in the figure below.

[6] International Capital Market Association (ICMA) "Green Bond Principles 2021" https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/

[7] Ministry of the Environment "Green Bond Guidelines 2022 Edition" https://wwitnv.go.jp/content/000062495.pdf

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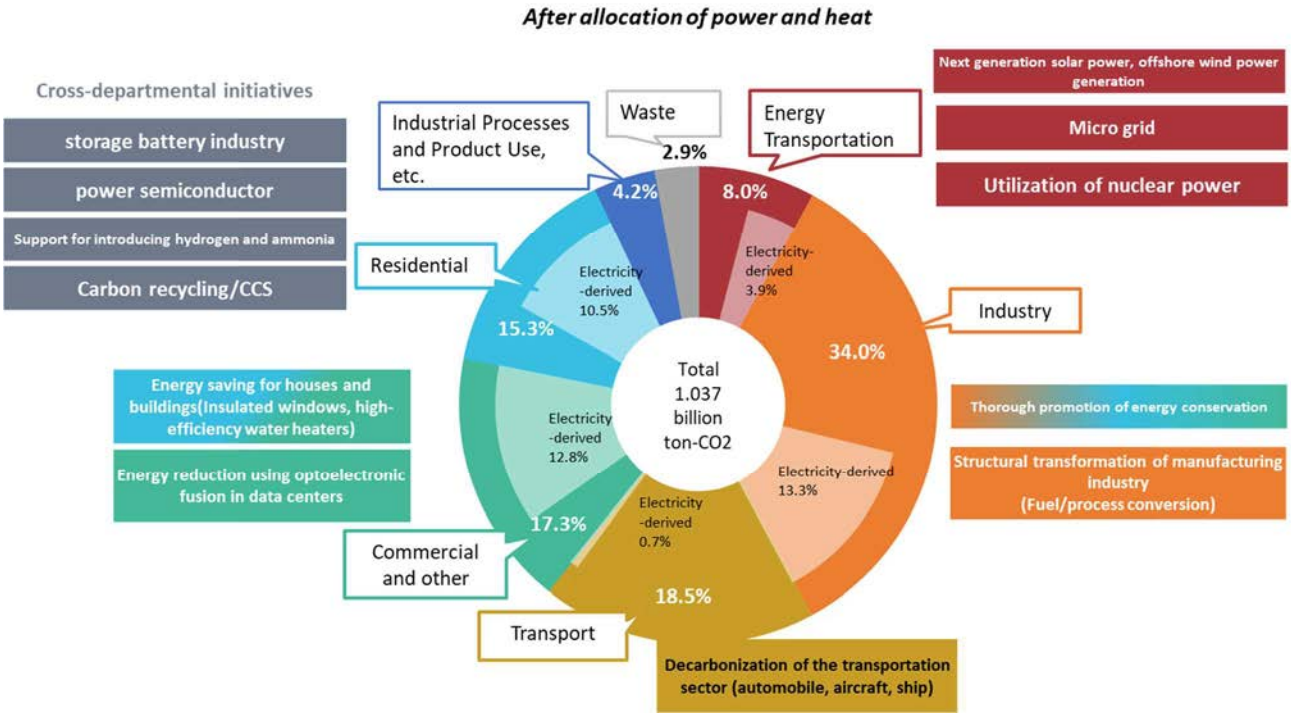

Figure 1: Relationship between use of proceeds from this Bonds and CO_2 emitting industries[8]

In the process of selecting projects set out in this Bonds by the government include (1) a liaison system between relevant ministries and agencies has been established; (2) the selection is to be finally approved in the GX Implementation Council chaired by the Prime Minister; (3) bonds to be issued, based on this framework are managed separately from other accounts in the energy supply and demand account of the special account for energy measures and (4) allocated projects are separately categorized as GX-related budgets in the same account. JCR therefore has evaluated that a system has been established to properly classify and manage proceeds financed, based on this framework. JCR has also confirmed that reporting contents/periods on the allocation of proceeds and impacts are adequately established. Accordingly, JCR has evaluated that the management and operation system in the national government has been established and has transparency.

Accordingly, JCR has assigned "gt1" to the preliminary evaluation of the "Greenness/Transition Evaluation (Use of Proceeds),"m1" to the preliminary evaluation of the "Management, Operation and Transparency Evaluation" and "Green 1(T)" to the "JCR Climate Transition Bond Preliminary Evaluation" for this Bonds. JCR has evaluated that this Bonds satisfies the criteria for items required in the "Green Bond Principles," "Green Bond Guidelines," and CTFH, etc.

[8] Created by JCR based on the Ministry of the Environment's "Japan's National Greenhouse Gas Emissions and Removals in Fiscal Year 2022"

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JCR's Key Consideration in This Factor

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Chapter 1: Overview of Evaluation Targets

The subjects of this evaluation are the 10-year Japan Climate Transition Bonds (2nd) and 5-year Japan Climate Transition Bonds (2nd) to be issued by Japan in FY2024 (collectively referred to as the "Japan Climate Transition Bonds (FY2024)" or the "Bonds").

The proceeds will be allocated to the projects, aiming to realize net-zero by 2050 that is an international commitment aligned with the Paris Agreement and a 46 per cent reduction by FY2030 (from base year FY2013) based on the "Strategy for Promoting Transition to a Decarbonized, Growth-Oriented Economic Structure (known as GX Promotion Strategy)."

The proceeds shall be selected from the measures/projects stipulated “GX Promotion Strategy” as well as the Climate transition finance framework established by the government. It will be repaid by several measures, since future carbon pricing ("CP" refers to charge for fossil fuels and expenses borne by specified business in the electricity sector) as financial resources: 1) it shall be taken into account the balance between benefits and burdens of citizens, 2) the investment decision is difficult for the private sector while considering the benefits and burdens perspectives and 3) it shall be prioritized to the investment area which will contribute to realize both emission reduction and industrial competitiveness strengthening and economic development of Japan.

The government considers to support high emission companies which participate in emission trading system called “GX League[9]”. So the implementing bodies of the use of proceeds shall be selected from those companies.

The "GX Promotion Strategy" listed 14 future action for efforts as exemplified in the "Decarbonization initiatives for GX on the premise of ensuring a stable energy supply" that promote toward decarbonization by the public and private sectors. The Government of Japan has organized these efforts into the Climate Transition Bond Framework as eligibility criteria for "Japan Climate Transition Bonds," which are individual issues of GX Economy Transition Bonds (See Japan Climate Transition Bond Framework[10] and JCR Evaluation Report[11] published on November 7, 2023).

In the Japan Climate Transition Bond Framework, the Government of Japan states that the selection of the use of proceeds will be based on the "basic conditions" of investment promotion measures based on the basic concept of upfront investment support for GX Economy Transition Bonds shown in Table 1(eligible business).

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[9] GX is an abbreviation for Green Transformation, which refers to the transformation and activities aimed at achieving this goal by utilizing clean energy while avoiding the use of fossil fuels as much as possible. The GX League is a group of companies that are actively working on GX, together with players from the government, academia, and finance who are taking on the challenge of GX, to discuss reforming the entire economic and social system and creating new markets. It was established by the Ministry of Economy, Trade and Industry as a place to practice creativity.

[10] Cabinet Secretariat / Financial Services Agency / Ministry of Finance /Ministry of Economy, Trade and Industry / Ministry of the Environment, "Japan Climate Transition Bond Framework", November 2023
https://www.meti.go.jp/policy/energy_environment/global_warming/transition/climate_transition_bond_framework_eng.pdf

[11] JCR "Japan Climate Transition Bond Framework Evaluation Report", November 2023
https://www.jcr.co.jp/download/b5abf0635c83b738b5c0dbc0628553c0b1bc9d13dcb3365a5c/23d1036en_2.pdf

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Table 1: GX Economy Transition Bond "basic conditions" in the selection of the use of proceeds (overview) [12]

Basic Conditions	
I.	Efforts that are truly difficult to make investment decisions solely by the private sector
II.	Efforts that contribute to strengthening industrial competitiveness, economic growth and emission reduction, which are essential for achieving GX
III.	Integration with regulations and institutional measures that change corporate investment and demand-side behaviour
IV.	Efforts that contribute to the expansion of domestic investment including for human capital

The government prioritizes projects that align with the types which meet each of the requirements from A to C for increasing industrial competitiveness/economic growth and the requirements from 1 to 3 for emission reduction as candidates subject to support in addition to the aforementioned principles.

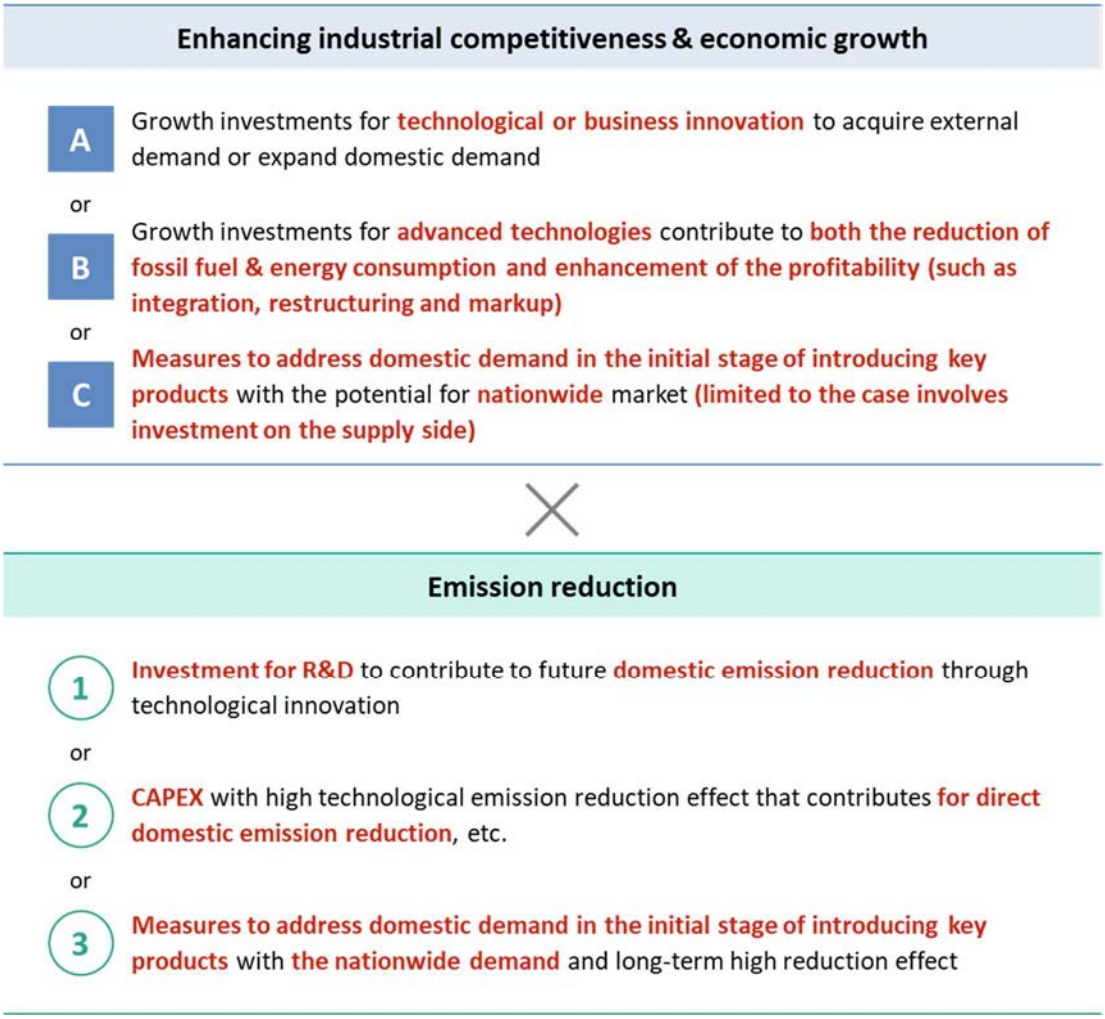

Figure 2: Requirements for selecting the use of proceeds for GX economy transition bonds[13]

[12] Source: Cabinet Secretariat / Financial Services Agency / Ministry of Finance /Ministry of Economy, Trade and Industry / Ministry of the Environment, "Japan Climate Transition Bonds Framework", November 2023

[13] Source: Cabinet Secretariat / Financial Services Agency / Ministry of Finance /Ministry of Economy, Trade and Industry / Ministry of the Environment, "Japan Climate Transition Bonds Framework", November 2023

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Based on the above, JCR evaluates the alignment of this Bonds with the Green Bond Principles, the Green Bond Guidelines of the Ministry of the Environment, and CTFH, etc., based on JCR Green Finance Evaluation Methodology in the next chapter in detail.

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2-1. Japan's Economic Policy and Transition Strategy

<Outline/Political/Social Situations>

Japan is located off the coast of the Far East and East Asia at the eastern end of the Eurasian Continent and the coastal areas in northwestern part of the Pacific Ocean, and it is island arcs as a whole. The land area is roughly 378,000 km^2, approximately 70 per cent of which is mountainous terrain that include roughly 67 per cent of forests and it ranks 62nd in the world. Natural disasters, such as earthquakes or typhoons has hit Japan more often than the rest of the world. While Japan's land area accounts for only about 0.29 per cent in the world, 18.5 per cent of earthquakes with a magnitude of 6 or higher have occurred in Japan since 7.1 per cent of the world's active volcanoes are located in Japan where there are many active faults. The amount of damage that Japan has suffered by natural disasters, including typhoons or earthquakes accounts for 17.5 per cent of the world; therefore, Japan is called as a disaster-prone country. Further measures from both mitigation/adaptation to climate change are urgent and the most important issues since many damage has recently occurred due to earthquakes and intensifying storms and floods disasters although the national government strives to make the country more resilient to climate change and earthquakes.

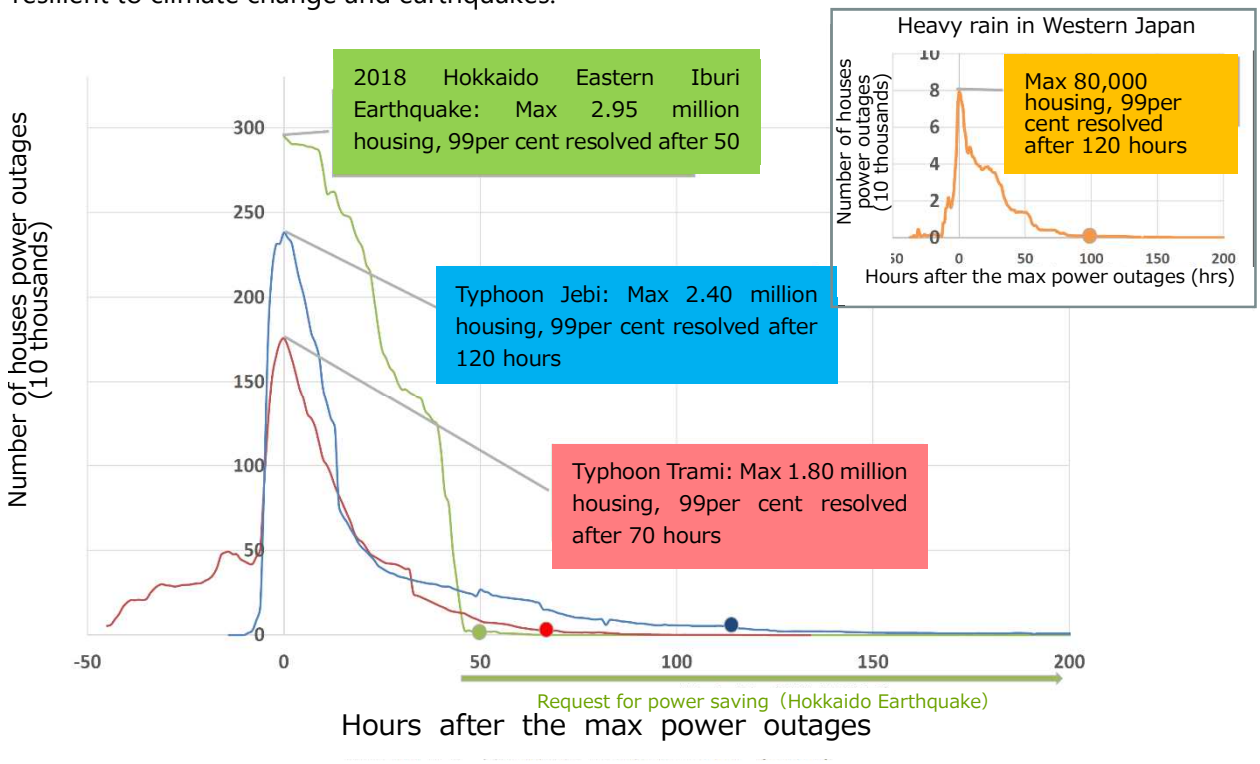

Figure 3: The number of power outages and time taken to resolve in each disaster[14]

The Japanese GDP in 2023 ranked forth after the United States, China and Germany thanks to a large number of internationally competitive manufacturing companies. According to the 2023 White Paper on Manufacturing Industries, Japan has 825 major manufacturing items in 2020 of which 220 items hold 60 per cent or more global market shares, a predominantly high number,

[14] Agency for Natural Resources and Energy at https://www.enecho.meti.go.jp/about/special/johoteikyo/blackout.html

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compared to the United States (99 items,) Europe (50 items) and China (45 items.) Roughly 70 per cent of the items are parts/materials, including electronics or automobiles, which is the strength of the Japanese manufacturing industry.

The total amount of GHG emissions in Japan with the thriving manufacturing industry, was 1.135 billion tons-CO_{2e} as of FY2022, ranked the seventh largest in the world; however, the actual amount in FY2022 was reduced by approximately 19.3 per cent from FY2013. Of which, the total CO_2 emissions amounted to 1.037 billion tons-CO_2, and 92.9 per cent of the emissions are resulting from energy use. The breakdown by sector is as follows: the energy transformation sector, 40.5 per cent; the industrial sector (the iron and steel, chemical and allied products and other industry), 24.4 per cent; the transportation sector, 17.8 per cent; the commercial industry, etc. sectors, 5.5 per cent and the residential sector, 4.8 per cent (Figure 3, before electricity and heat distribution.)

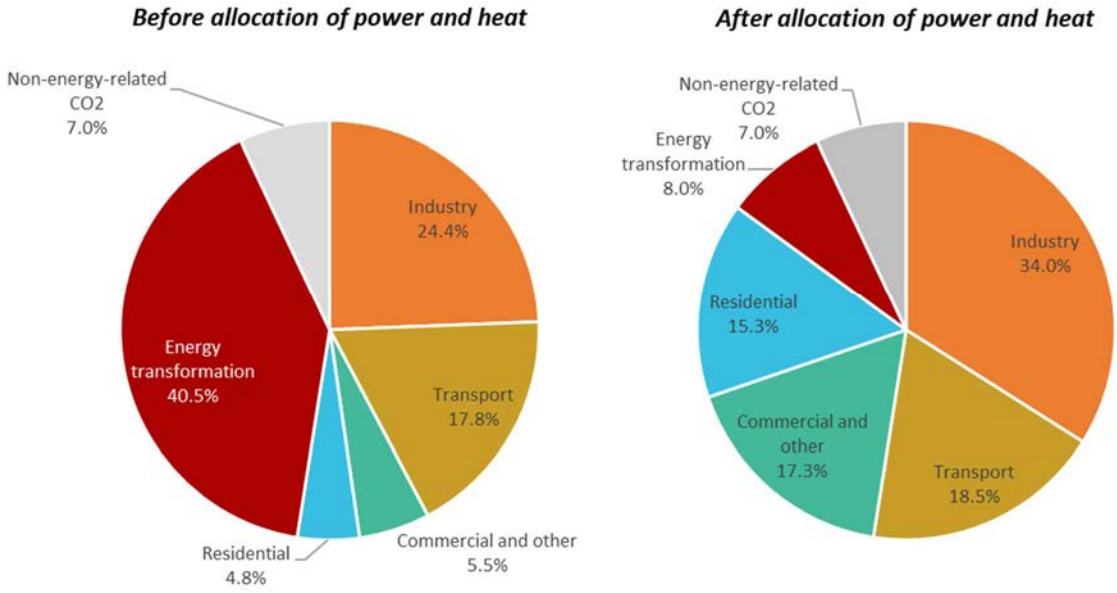

Figure 4: Breakdown of CO_2 emissions by sector (FY2022)[15]

The Government of Japan has aggressively led the decarbonization initiatives in the international community with ambitious developmental promotion of solid/new technologies by discussing over global promotion of GX that is a transformation of the entire economic and social system so as to shift to the clean energy-centered economy, society and industrial structure from the fossil fuel-centered since the Industrial Revolution, based on the spirit of the Paris Agreement and furthermore to integrate carbon neutral, a circular economy and nature revival by accelerating the measures against climate change in the whole world and by compiling an agreement, stating to aim to keep the global temperature rise below 1.5 °C by 2030 in the "G7 Sapporo Climate, Energy and Environment Ministers' Meeting" as its host country in the G7 Hiroshima Summit in May 2023.

[15] Created by JCR based on the Ministry of the Environment's "Japan's National Greenhouse Gas Emissions and Removals in Fiscal Year 2022"

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<Plan for Global Warming Countermeasures>

The Government of Japan established goals set forth in the Paris Agreement (keep the global temperature rise well below 2 °C and to pursue efforts to limit the temperature increase even further to 1.5 °C) and set out the basic principles for promoting global warming countermeasures, such as realizing decarbonized society for net-zero by 2050, the integrated improvement of the environment, economy and society and the close cooperation with citizens and other parties concerned in the Act on Promotion of Global Warming Countermeasures revised in March 2021. The goal of reducing GHG by 46 per cent in FY2030 from FY2013 as an interim target was announced, adding its challenge continues to further reduce by 50 per cent in the Plan for Global Warming Countermeasures revised in October 2022, based on the revised Act on Promotion of Global Warming Countermeasures.

The transition of GHG emissions in Japan, which is the premise of the plan, is shown in Figures 5 and 6, respectively. The total GHG emissions amounted to 1.135 billion t-CO_{2e} in FY2022, decreased by roughly 19.3 per cent (271.9 million t-CO_{2e}) from FY2013 (1.407 billion t-CO_{2e}.)

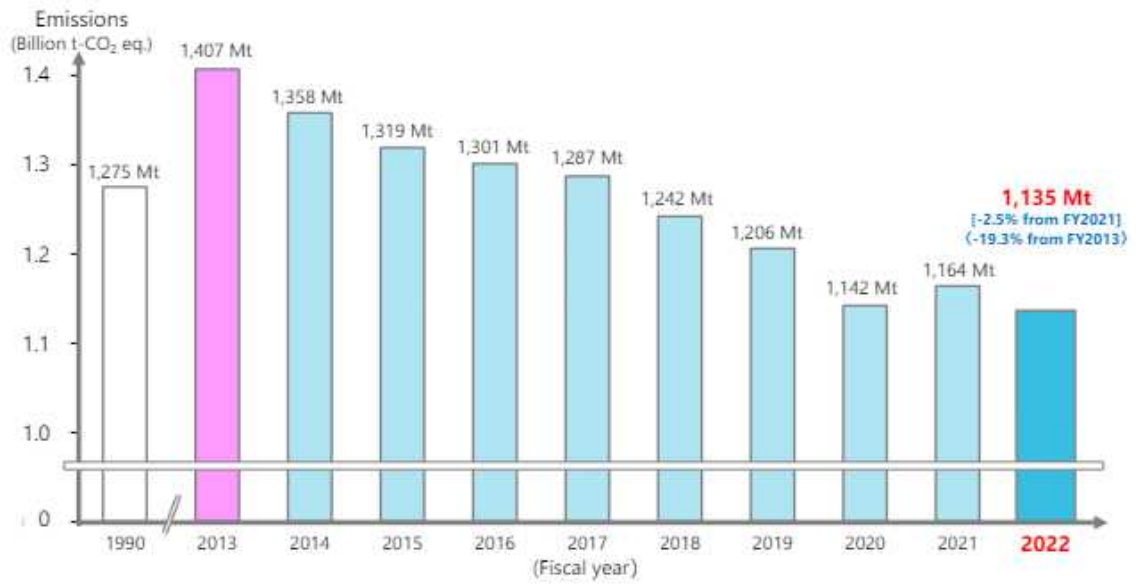

Figure 5: Changes in Japan's total GHG emissions[16]

[16] Source: the Ministry of the Environment's "Japan's National Greenhouse Gas Emissions and Removals in Fiscal Year 2022"

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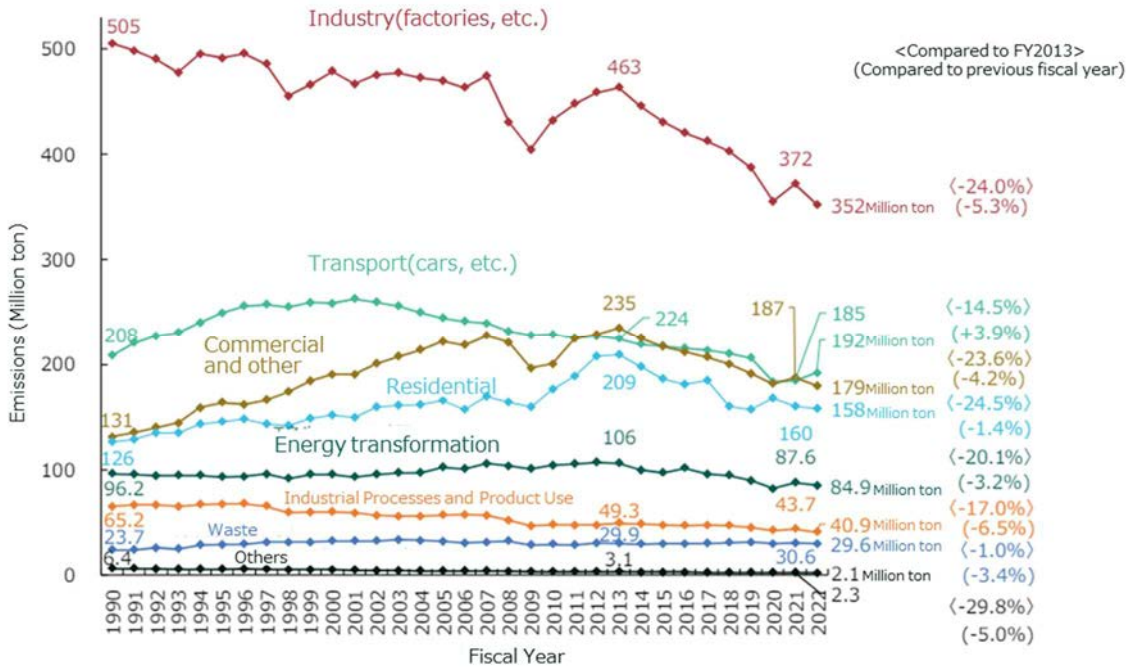

Figure 6: Trends in Japan's CO_2 Emissions by Sector[17]

The reduction targets were established for FY2030 by GHG and by division for energy-derived CO_2 in the Plan for Global Warming Countermeasures (see Figure 7, next page.) Some examples of measures that are expected to be taken by the national and local governments for respective emission sources or targets by division were also set forth with the specific reduction figures in this plan.

[17] Translated by JCR based on the Ministry of the Environment's "Japan's National Greenhouse Gas Emissions and Removals in Fiscal Year 2022"

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(Unit: Million t-CO_2, (Base year 2013 comparison))

	FY2013	FY2019	FY2030
Greenhouse gas emissions and removals	1,408	1,166 (▲17%)	760 (▲46%)
Energy-related CO_2	1,235	1,029 (▲17%)	677 (▲45%)
Industry	463	384 (▲17%)	289 (▲38%)
Commercial and others	238	193 (▲19%)	116 (▲51%)
Residential	208	159 (▲23%)	70 (▲66%)
Transport	224	206 (▲8%)	146 (▲35%)
Energy Conversion	106	89.3 (▲16%)	56 (▲47%)
Non-energy-related CO_2	82.3	79.2 (▲4%)	70.0 (▲15%)
Methane ($CH_{4)}$	30.0	28.4 (▲5%)	26.7 (▲11%)
Nitrous oxide (N_2O)	21.4	19.8 (▲8%)	17.8 (▲17%)
Four gases incl. alternative CFC	39.1	55.4 (+42%)	21.8 (▲44%)
Hydrofluorocarbons (HFCs)	32.1	49.7 (+55%)	14.5 (▲55%)
Perfluorocarbons (PFCs)	3.3	3.4 (+4%)	4.2 (+26%)
Sulfur hexafluoride (SF_6)	2.1	2.0 (▲4%)	2.7 (+27%)
Nitrogen trifluoride (NF_3)	1.6	0.26 (▲84%)	0.5 (▲70%)
Greenhouse gas removals	-	▲45.9	▲47.7
Joint Crediting Mechanism (JCM)	Japan aims to contribute to international emission reductions and removals at the level of a cumulative total of approximately 100 million tCO_2 by fiscal year 2030 through public-private collaborations. Japan will appropriately count the acquired credits to achieve its NDC.		

Figure 7: Japan's GHG Emission Reduction Targets and guidelines by GHG and other categories[18]

<Strategy for Promoting Transition to Decarbonized Growth-Oriented Economic Structure (GX Promotion Strategy)>

As shown in Figure 7 above, energy-derived CO_2 accounts for a little under 90 per cent of GHG emissions in Japan. It is therefore important to steadily take concrete measures for decarbonization in the industry, business, transportation and residential sectors, based on the national energy basic plan and national energy mix in order to achieve the FY2030 target. The Government of Japan launched "GX" that is to transform the industrial and social structures

[18] Source: "Plan for Global Warming Countermeasures" decided in the cabinet in October 22, 2021 at https://www.env.go.jp/content/900440195.pdf

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mainly from fossil energy-centered since the Industrial Revolution into clean energy-centered in the 6th Strategic Energy Plan, decided in the cabinet in October 2021. The government has held the GX Implementation Council, chaired by the Prime Minister and composed of experts from the government, private sectors and academia since 2023 and compiled "the Basic Policy for the Realization of GX." The GX Promotion Act and the GX Decarbonized Power Supply Act were enacted in 2023, and a system to promote initiatives toward "Pro-Growth Carbon Pricing Concept" was established. "GX Promotion Strategy" was decided in the cabinet in July 2023, based on the GX Promotion Act as a concrete strategy for implementing a series of policies.

Table 2: Overview of GX Promotion Strategy[19]

(1) GX initiatives based on the premise of ensuring a stable energy supply	(2) Realization and implementation of the "Pro-Growth Carbon Pricing Concept" and other initiatives
1. Promotion of thorough energy efficiency improvement ・ Energy saving support for small- and medium-sized enterprises ・ Housing energy saving support ・ Conversion to non-fossil energy and further energy saving support in five major industries (steel, chemical, cement, paper and automobile) 2. Making renewable energy a mainstay power source ・ Accelerating maintaining grids and realizing submarine direct current (DC) transmission from Hokkaido ・ Introducing renewable energy in harmony with the community, social implementation of next generation solar power (Perovskite) and floating offshore wind power 3. Utilization of nuclear power ・ Materializing next-generation innovation reactors ・ Securing an operation period of 40 years + 20 years and additional extension on the premise of strict safety inspection ・ Increasing efforts for nuclear fuel cycles/ decommissioning and final disposal 4. Other important matters ・ Constructing hydrogen/ammonia supply chains ・ Introducing decarbonization power supply auction ・ Strategically securing surplus LNG ・ R & D, capital expenditures and demand creation for GX, such as carbon recycling, batteries, resource recycling, next-generation automobiles/ aircraft or zero-emission ships	To realize GX investments with over 150 trillion yen by public and private sectors for the next 10 years. 1. Upfront Investment support utilizing GX Economy Transition Bonds ・ Support up-front investment of 20 trillion yen for the next 10 years 2. GX investment incentives through "Pro-Growth Carbon Pricing Concept" <Specific example> i) Full-scale operations of the emissions trading scheme (in and after FY2026) ii) Introducing a carbon tax system for fossil fuels importers (in and after FY2028) * GX Acceleration Agency was established as the aforementioned implementing body 3. Utilization of new financial instruments ・ GX Acceleration Agency considers/implements risk supplement measures, such as debt guarantee ・ Environment development to promote sustainable finance 4. International strategy, Just Transitions, and GX of small and medium enterprises (SMEs) and other businesses ・ Asia Zero Emission Community Initiatives ・ Promoting smooth labor mobility ・ Stimulating demand for decarbonized products ・ Promoting efforts throughout the supply chains, including SMEs, such as human resources development during the SME support period for push-type support
(3) Progress Evaluation and Necessary Reviews: Progress evaluation will be regularly conducted, based on the impacts on the progress of GX investments, global trends and economy.	

The GX Promotion Strategy highly prioritize energy conservation and introducing as much renewable energy as possible as a main power source, After doing the prioritized policy above, the government supplements the rest of the electricity demands which cannot be covered by renewable energy by next-generation clean energy such as hydrogen, ammonia and synthetic fuels as well as nuclear power to realize zero carbon emission society. It also includes resources recycling and other important measures. All of these measures are based on technical grounds, and the combinations of technologies assumed in each cross section by FY2023, FY2030, FY2040

[19] Summarized/prepares by JCR based on disclosure materials provided by METI.

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and FY2050 are compiled as "Future milestones" for all 22 categories. CO_2 reduction effects, economic rationality and probability of social implementation in the Sector-specific Investment Strategies for the next 10 years and the action plan with a five-year lead will be discussed per sector by experts with academics invited and will be eventually decided in the GX Implementation Council, chaired by the Prime Minister as for concrete projects for the measures set forth in these Pathway.

The "Future milestones" is aligned with the sectoral technology roadmaps (hereinafter referred to as "sectoral roadmap") formulated by the METI. The sectoral roadmaps have been prepared sequentially since FY2021 for industries with relatively large emissions, such as steel, chemicals, electric power, gas, oil, paper and pulp, cement or automobiles. Low-carbon/decarbonized technologies for achieving net-zero by 2050 to be sectorally used are comprehensively covered, including the existing/future technologies that will be developed, aiming at social implementation and the routes are shown so as to align with the 2030 goals to limit to keep the global temperature rise well below 2 °C and to pursue efforts to limit the temperature increase even further to 1.5 °C and to achieve net-zero by2050 with the combination of these technologies.

<Materiality of Decarbonization Transition Strategies in Japan>

The Government of Japan has positioned the GX initiatives as important measures that will contribute to the re-increasing Japanese industrial competitiveness by ensuring a stable supply of clean energy and creating new demand and markets in the decarbonization sector through shifting from the industrial and social structures on fossil energy-centered since the Industrial Revolution to clean energy-centered. Acceleration of GX, DX etc. is positioned as one of the five pillars for increasing investments and implementing economic and social reforms to accelerate new capitalism in the "Basic Policy on Economic and Fiscal Management and Reform 2023" and "Grand Design and Action Plan for a New Form of Capitalism."

Table 3: Framework of Basic Policies for Economic and Fiscal Management and Reform for 2023[20]

<table>
<tr><td colspan="2">I. Basic Views on Macroeconomic Management
Proceed with bold reforms to overcome the historical and structural changes and challenges facing Japan, both internal and external, which may be referred to as “turning points in the times.”</td></tr>
<tr><td>II. An Accelerating New Form of Capitalism
Realization of structural wage increases through the trinity labor market reforms, and strengthening investment in people, and creating a substantial middle class
Drastic strengthening of measures to cope with the declining birth rate and child policy
Expanding investment and implementing economic and social reforms
1. Increasing domestic investment and strengthening supply chains through public-private partnerships
2. Acceleration of GX, DX etc.</td><td>III. Responding to the Environment Changes Surrounding Japan
Responding to changes in the international environment
Disaster prevention and mitigation, national resilience, reconstruction from the Great East Japan Earthquake, etc.
Safety and security of people's lives</td></tr>
</table>

[20] Prepared by JCR, based on the website of Cabinet Office, Basic Policy on Economic and Fiscal Management and Reform 2023 https://www5.cao.go.jp/keizai-shimon/kaigi/cabinet/honebuto/2023/summary_en.pdf

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3. Driving Start-ups and Converting to New Industrial Structure Promoting Impact Investment 4. Promoting Science, Technology and Innovation through Public-Private Partnerships 5. Deploying Inbound Strategies Creation of an inclusive society Revitalization of local communities and small businesses	
IV. Medium- and Long-Term Economic and Fiscal Management	V. Policy for Near-term Economic and Fiscal Management and FY2024 Budget Formulation

<Governance>

The directions of policies for GX implementation will be decided in the GX Implementation Council, chaired by the Prime Minister, with relevant ministers and experts participated. The Council includes experts in the industrial and financial sectors. The Cabinet Secretariat GX Office include officials sent from the Financial Services Agency, the Ministry of Foreign Affairs, the Ministry of Finance, the Ministry of Health, Labor and Welfare, the Ministry of Agriculture, Forestry and Fisheries, the METI, the Ministry of Land, Infrastructure, Transport and Tourism and the Ministry of the Environment, and they will compile proposals, including investment promotion measures of relevant ministries and agencies and will submit the sectoral investment strategical proposals, based on considerations in the working group with external experts to the GX Implementation Council.

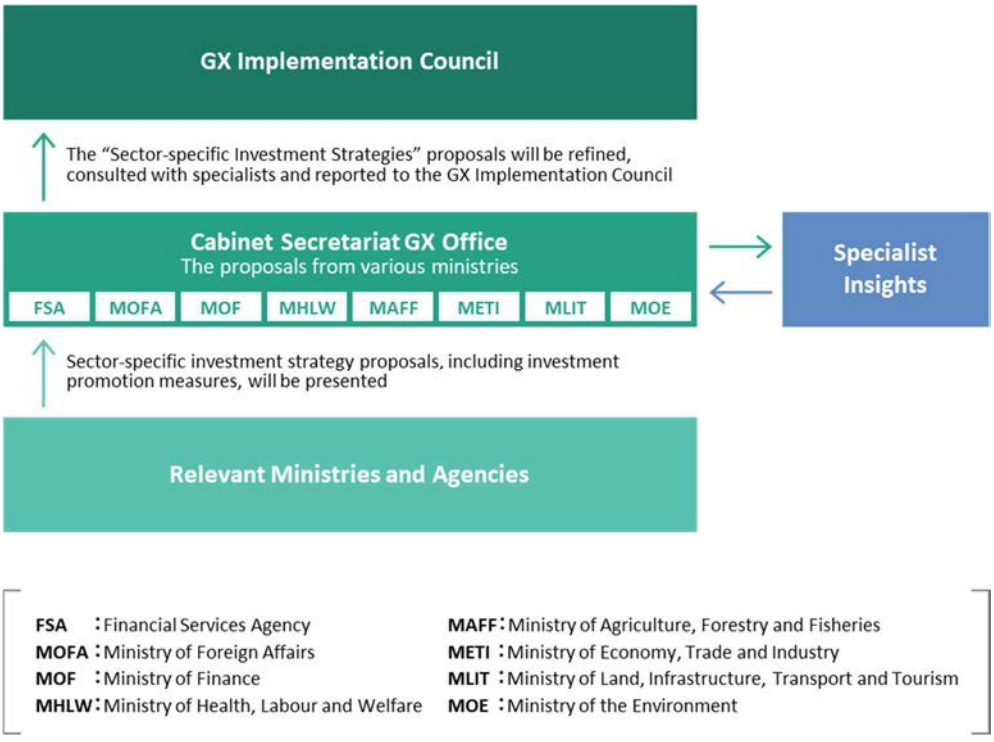

Figure 8: Governance Structure[21]

[21] Source: Cabinet Secretariat / Financial Services Agency / Ministry of Finance /Ministry of Economy, Trade and Industry / Ministry of the Environment, "Japan Climate Transition Bonds Framework", November 2023

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The current status/measures of GHG emissions and removals will be approved in the Global Warming Prevention Headquarters, in which all ministers annually participate, and then the plan will be updated/promoted as necessary from the viewpoint of measuring the effects of the aforementioned investment strategies.

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2-2. Alignment with Items Required in the Climate Transition Finance Handbook

Element 1: Issuer's climate transition strategy and governance

(1) Does the issuer have a transition strategy for climate change mitigation?

The Government of Japan has clarified that it aims to achieve net-zero by 2050 for which it will take necessary measures in the Act on Promotion of Global Warming Countermeasures. The government set the FY2030 target (a 46 per cent reduction from FY2013) to align with the target agreed in the Paris Agreement and established the reduction target per emission source for FY2030 from FY2013 in the Plan for Global Warming Countermeasures revised in 2021.

Specific measures toward the aforementioned goals are compiled in the GX Promotion Strategy (see Table 2 above.) The top priority is to thoroughly promote energy conservation and to make renewable energy main power source as specific initiatives to be undertaken by the Government of Japan, and then it aims to achieve its goals by supporting in respective sectors so as to implement/achieve next-generation technologies/developments, such as the utilization of nuclear power or hydrogen/ammonia/carbon recycling in the 22 sectors.

Accordingly, the Government of Japan has strategies for transitioning to mitigate climate change.

(2) Is the use of the "transition" label in financing intended to contribute to realizing a strategy for transitioning to a business model in which issuers can effectively address climate-related risks and contribute to achieving the goals of the Paris Agreement?

The Government of Japan published the Basic Guidelines on Climate Transition Finance in May 2021, shortly after the first edition of CTFH was published by ICMA in December 2020. This basic guideline aims to encourage efforts to steadily reduce carbon emissions, such as energy saving in sectors where is difficult to reduce emissions or to accelerate the innovation that contributes to transitions, including long-term R & D for decarbonization. The Guideline was formulated to achieve net-zero by 2050 in Japan and to contribute to realizing the goals of the Paris Agreement in order to establish the position as a financing tool for transition, in particular, in the sector where is difficult to reduce emissions and to use more proceeds by early disseminating climate transition finance and by ensuring the credibility when financing proceeds under the name of transition finance.

This Bonds was formulated in accordance with the CTFH and its Basic Guidelines, and is intended to contribute to realizing the strategies to shift to a business model by which Japan as a whole is contributable to achieving the goals of the Paris Agreement.

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(3) Has a governance system been established to ensure the effectiveness of the transition strategy?

The Government of Japan, as mentioned above, will invite relevant ministries, external academics and experts in respective sectors required for GX, will eventually formulate the transition strategy in the GX Implementation Council, chaired by the Prime Minister based on necessary discussions, will report the subsequent progress to the Council and will review them as needed.

Accordingly JCR has evaluated that the Government of Japan has established a system to steadily implement the transition strategy.

Element 2: Business model environmental materiality

Japan's GHG emissions are the seventh largest in the world in 2022, and it is expected for Japan to lead the international community to initiatively limit the global temperature rise to the level set by the Paris Agreement. Taking into account that carbon prices will be introduced domestically and internationally hereafter, it is urgent to realize a carbon-neutral society, to decarbonize various types of products stipulated by the GX Promotion Act and to change the structure of each business type while many manufacturing industries that is internationally competitive continuously maintain good performance. Under these circumstances, the Government of Japan presented a "Grand Design and Action Plan for a New Form of Capitalism" in June 2023 in which GX in Japan is expected to contribute to re-increasing the industrial competitiveness by making the best use of its knowledge in these sectors and to accelerating the transition to the decarbonization in the country as a whole since there are many research decarbonization technologies in which Japanese companies have technological strength.

Accordingly, JCR has evaluated that the Government of Japan's efforts to achieve net-zero in GX are one of the most important issues for Japan.

Element 3: Climate transition strategy and targets to be science-based

Does the transition roadmap meet the followings?

(1) The roadmap is quantitatively measurable and the target covers Scope 1 and Scope 2, respectively (it is desirable that the Scope 3 target be set to the extent feasible.)

As shown in the Plan for Global Warming Countermeasures, Japan's GHG emission reduction target is aligned with the goals of the Paris Agreement, which are science based targets agreed upon by the international community; specifically, to limit the global temperature increase to well below 2 °C. JCR has examined this factor according to the definition established by PCAF[22] since the Government of Japan does not use the concept of Scope 1, Scope 2 and Scope 3 for the total amount of emissions. Assuming that the direct business activities of Government of Japan are Scope 1 and Scope 2, the target setting and specific measures are planned for reducing

[22] "Decarbonization practice guidance starting from portfolio carbon analysis for financial institutions" by Ministry of Environment, at https://www.env.go.jp/content/000125696.pdf

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the emission from the central government's administration activities. The total emissions of Japan as a whole, which is equivalent to those of Scope 3 are disclosed in the Plan for Global Warming Countermeasures, by emission sources and by sectors as described in Figure 6 of this report.

Accordingly, the Government of Japan's plan appropriately covers the target scopes. And both the emission reduction results and mid target are disclosed, which shows Japan's transition plan's high transparency.

(2) Whether the GHG emission reduction target aligns with globally recognized science based target or not

The target set by the Government of Japan was established in 2021 on the premise of achieving the global temperature rise well below 2 °C declared in the Paris Agreement. The sectorial roadmaps which were formulated especially for high GHG emitted industries to achieve net zero emission by 2050, align with the IEA[23]'s NZE scenario[24] and SDS scenario[25]. The sectoral pathway were also taken into consideration of the possible menu of the current and future carbon reduction technologies.

The target formulated by the Government of Japan (a reduction rate, 2.7 per cent per year) is set to align with the 1.5 °C level shown in the IPCC[26]'s 1.5 °C Special Report[27] (a 45 per cent reduction by 2030 from the 2010 level; a reduction rate of 2.25 per cent per year.) Consequently, JCR has evaluated that the government targets is aligned with the target established, based on scientific grounds.[28]

For reference, the figure below (next page) shows the relative ambition level of goal setting compared to that of other countries.

[23]IEA: International Energy Agency
[24]Net Zero Emissions by 2050 Scenario by IEA
[25]Sustainable Development Scenario (Sustainable Development Scenario), which is the path to fully achieve the sustainable development goals by the IEA
[26]IPCC: Intergovernmental Panel on Climate Change
[27]IPCC "Global Warming of 1.5°C An IPCC Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty at https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_Full_Report_HR.pdf
[28]The IPCC's 1.5 °C Special Report was updated in the IPCC's the 6th Assessment Report (AR6) Integration Report in which the 1.5 °C is targeted to be reduced by roughly 36 – 69 per cent of CO_2 from FY2016 by FY2030: Reduction Rate: 3.3 – 3.6 percent per year.

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Country	Emission Reduction Target by 2030 (Base Year 2013)
The U.K.	-54.6%
Switzerland	-49.4%
Brazil	-48.7%
Japan	**-46.0%**
The U.S.A.	
Saudi Arabia	-45.6%
EU27	-43.3%
Canada	-41.6%
South Africa	-40.4%
South Koriea	-33.3%
Ukraine	-23.7%
Australia	-23.0%
Mexico	-18.4%
Thailand	-0.4%
Kazakhstan	7.0%
China	8.6%
Malaysia	14.1%
Russia	23.1%
India	51.8%
Indonesia	99.2%
Pakistan	131.0%
	234.6%

Figure 9: GHG emission reduction rate target for FY2030 (comparison when each country's target is replaced with figures based on the 2013 standard)[29]

(3) Details must be publicly disclosed (including intermediate milestones)

The goal of the Government of Japan to achieve net-zero by 2050 is clearly stated in the Act on Promotion of Global Warming Countermeasures. The goal of reducing the total GHG emissions by 46 per cent from FY2013 in FY2030 was announced in the Plan for Global Warming Countermeasures as an interim target, and it is also added that the challenge will continue, aiming for a higher goal, a 50 per cent reduction. Furthermore, the FY2030 targets per emission source are disclosed in the plan, which is highly transparent.

(4) Certified/verified by an independent third party

Japan's GHG emissions and removals (inventory) are reported to the United Nations Secretariat. In addition, Japan is required to submit a Biennial Transparency Report (BTR) every two years, which reports on the status of GHG emissions and removals, as well as progress towards achieving the NDC, to have a review conducted by the Secretariat. In addition, the current NDC and the Plan for Global Warming Countermeasures were discussed in a council that included experts with scientific knowledge, and were under the public consultation before being approved by the Global Warming Prevention Headquarters, which consists of all cabinet ministers. JCR believes that these are sufficiently controlled by domestic and international

[29] Materials of a joint meeting for a clean energy strategy "Materialize political initiatives for realizing GX"

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experts other than those in the department responsible for calculating GHG emissions, and that they can be deemed to have been verified by a third party.

Consequently, JCR has evaluated that the Government of Japan's efforts to achieve net-zero by 2050 are based on scientific evidences and meet the requirements in Element 3.

Element 4: Implementation transparency

The Government of Japan has recognized the need for invest a total amount of 150 trillion yen of public and private investment in the GX Promotion Strategy for the next 10 years. The specific breakdown is also published by energy supply division and demand division, respectively as follows:

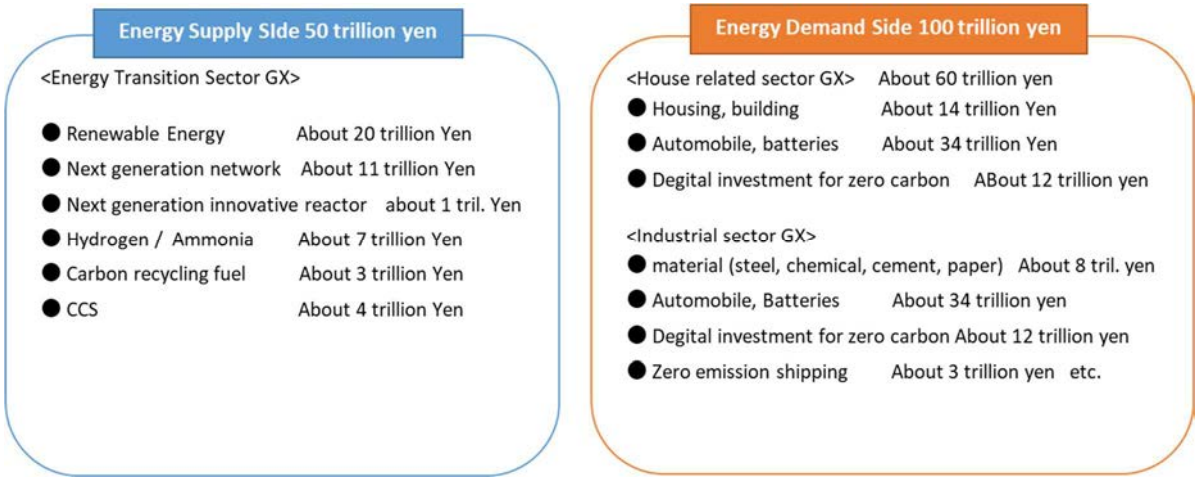

Figure 10: Breakdown of public/private investments for the next 10 years[30]

Of the total investment of 150 trillion yen, 20 trillion yen is expected to be implemented as an investment promotion measure through GX Economy Transition Bonds. In order to increase the predictability of companies and strongly draw out GX investment, the Japan government has compiled a "Sector-specific Investment Strategies" in FY2023 as a concrete investment promotion measure for the next 10 years and a "Five-Year Action Plan." In addition, at the GX Executive Committee held in May 2024, the main implementation status of GX investment support measures and a breakdown of the government's investment plans for the next 3-10 years were presented as follows[31]:

[30] Sources: Materials for the GX Implementation Conference: Toward the achievement of GX in Japan
[31] December 22, 2023 "Sector-specific Investment Strategies"
https://www.cas.go.jp/jp/seisaku/gx_jikkou_kaigi/pdf/kihon1222.pdf

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Innovative technology development	Already allocated 1 trillion yen	・Representative examples from the Green Innovation Fund, which supports innovative technology development with high decarbonization effects: (i) Promoting development of next-generation solar cells (perovskite), to be launched on the market in 2025 (ii) Demonstration equipment for hydrogen reduction steelmaking to be introduced in 2026 (iii) Successfully developed ammonia combustion, to be commercialized in Malaysia in 2026 (MOU signed), etc. *Support for R&D of ammonia ships (plus support for production equipment for zero-emission ships, etc.) ・Support for basic research and human resource development at universities, etc. through the Green Technologies for Excellence (GteX) Program ・Support for development of semiconductor technology (photonics-electronics fusion) to drastically reduce electricity consumption, etc.
Structural transformation of high-emission industries	1.3 trillion yen or more (for 10 years)	・"Innovative electric furnaces" that cut emissions by more than half, chemical recycling, biorefineries, CCUS, etc.
Household GX	2 trillion yen or more (for 3 years)	・Renovating homes to insulated windows (strengthening the insulation of windows, which account for 70% of heat entering and leaving homes) ・Introduction of high-efficiency water heaters (heat pumps, etc.) ・Support for the introduction of electric vehicles/storage batteries, etc.
Hydrogen, etc.	3 trillion yen or more (for 15 years)	・Support measures focusing on the price difference of hydrogen, etc.
Next-generation renewable energy	1 trillion yen or more (for 10 years)	In addition to renewable energy introduction support measures (FIT system) on the scale of several trillion yen per year, ・Support for building supply chains for perovskite, floating offshore wind, water electrolysis equipment, etc., and consideration of support for the introduction of perovskite (in addition to the GI fund, 1 trillion yen will be provided over 10 years)
Small and medium-sized enterprises, startups, etc.	1 trillion yen or more (for 3-5 years)	・Support for energy conservation for small and medium-sized enterprises, etc. (700 billion yen will be provided over 3 years) ・Support for GX startups (200 billion yen will be provided over 5 years) etc.
Tax measures		- Establish new tax credits based on the production and sales volume of green steel, green chemicals, SAF, EVs, etc.

Figure 11: Implementation status of GX investment support measures[32]

The specific investment details of each year are to be announced after the approval of the annual budget, since the government's budget is to be implemented in a single year.

Accordingly, JCR has evaluated that the government's investment plan to be highly transparent, as it discloses information such as the government's planned expenditures, the scale of public and private investment that is expected to be promoted by such expenditures, and a 10-year roadmap.

[32] Translated by JCR based on "Toward accelerating Japan's green transformation" (May 13, 2024) submitted to GX promotion council.
https://www.cas.go.jp/jp/seisaku/gx_jikkou_kaigi/dai11/siryou1.pdf

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The sectoral roadmaps formulated by the METI indicated that there are more than one sectors that require business transformation or employment transfer along with the implementation of the transition strategy in Japan. No consideration is needed for direct and just transition like companies' transition strategies since much expenditures through GX economy transition bonds are used for R & D or subsidy programs for companies. On the other hand, the Government of Japan recognizes that the realization of just transition is an important issue when considering Japanese characteristics, which has a high ratio of manufacturing and low mobility of human resources. For this reason, the government will promote just transition as a whole policy package, such as the design of CP that ensures predictability and the consideration in the GX Implementation Council in which academics from the world of labor and the business circle participated.

The possibility of a lock-in to fossil fuels is lower since both of the sectoral roadmap formulated by the Government of Japan and the path in the GX Promotion Strategy are designed to achieve net-zero by 2050, and the roadmap is established not to rely on carbon credit as much as possible and to realize carbon neutral through the next-generation technological innovation.

From the perspective of DNSH (Do No Significant Harm), environmental impact and resilience are taken into account in the evaluation when selecting research and development targets, and clear criteria are established in the criteria for granting subsidies in the subsidy program, so that serious negative impacts on the environment can be avoided. **Accordingly, JCR has evaluated that this Bonds satisfy the four elements required in the Climate Transition Finance Handbook.**

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Chapter 3: Consistency with Green Bond Principles, etc.

Evaluation Phase 1: Greenness/Transition Evaluation

gt1

I. Use of Proceeds

JCR's Key Consideration on This Factor

In this section, JCR will firstly confirm whether the proceeds financed are allocated to green/transition projects that bring about clear environmental benefits. Then, in case where negative impacts on the environment and society is expected with the use of proceeds, the impacts will be fully examined by an in-house specialized division or external third parties and will confirm that necessary workarounds and mitigation measures are taken. Lastly, JCR will confirm alignment with the Sustainable Development Goals (hereinafter referred to as "SDGs".)

▶▶▶ Current Status of Evaluation Targets and JCR's Evaluation

JCR conducted an evaluation of the Japan Climate Transition Bond Framework developed by the Government of Japan and published the evaluation report on November 7, 2023. In this evaluation report, JCR confirmed how each criterion of the Japan Climate Transition Bond Framework contributes to the realization of a decarbonized society in Japan. All of the uses of proceeds determined by the Government of Japan for this Bonds fall under the categories whose eligibility and environmental improvement effects were confirmed in the framework evaluation. Therefore, JCR evaluates that all of the planned uses of the proceeds from this Bonds are important projects for Japan's 2030 GHG reduction goals and Japan's transition to a decarbonized society.

1. Overview of use of proceeds

In the Japan Climate Transition Bond Framework, the Government of Japan determines the use of proceeds from the areas specified in the GX Promotion Strategy as measures that contribute to Japan's GX, and the basic conditions specified in the strategy (see Chapter 1). Established as research and development funds and/or subsidy programs for projects that meet the requirements. Table 4 shows the use of proceeds for this Bonds, which is organized according to the use of proceeds classification in the Japan Climate Transition Bond Framework. In addition, "Deep Tech Startup Support Program in the Green Transformation field," which provides necessary support for social implementation for startup companies in the GX sector, and "Capital for GX Acceleration Agency," in which the GX Acceleration Agency provides financial support services such as debt guarantees to supplement risks that private financial institutions cannot fully address mainly in the GX sector, are businesses that target all categories, so they are described as cross-sectoral in Table4. Please see below for details of the businesses.

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Table 4: Use of proceeds for this Bonds in the classification of the Japan Climate Transition Bond Framework[33]

Main Category (Green category)		Sub-category Eligibility criteria	Use of proceeds for this Bonds
1	Energy efficiency	Promotion of thorough energy efficiency improvement	- Subsidy for energy saving investments/demand structure conversion - Subsidy for promoting energy savings in households through installing high-efficiency water heaters
		Houses and buildings	- Accelerating energy/emissions savings of housing through promoting renovations for insulated windows - Accelerating decarbonizing renovations for commercial buildings
		Digital investment aimed at decarbonization	- Support for strengthening domestic production capacity of power semiconductors contributing to energy savings - R&D for post-5G information communications system infrastructure enhancement
		Battery industry	- Support for strengthening manufacturing supply chains of batteries - Installation support for electricity storage systems such as grid-scale batteries to expand renewable energy usage
2	Renewable energy	Making renewable energy a major power source	- Support for building GX supply chains ("Installation support for electricity storage systems such as grid-scale batteries to expand renewable energy usage" also meet this criterion.)
		Infrastructure	- Regional decarbonization promotion grant
3	Low-carbon and decarbonized energy	Utilization of nuclear power	- Development of test furnace of fast reactor - Development of test furnace of high temperature gas-cooled reactor
		Establishing electricity and gas markets to achieve carbon neutrality	(No applicable projects in this Bonds.)
4	Clean transportation	GX in transport sector	- Subsidy for introducing clean energy vehicles - Promotion of electrifying commercial vehicles - Support for establishing production and supply system of sustainable aviation fuel (SAF) - Promotion of the construction of zero-emission ships etc.
		Infrastructure (repeat)	(No applicable projects in this Bonds)
5	Circular economy adapted products, production technologies and processes	Restructuring the manufacturing industry (fuel and feedstocks transition)	- Support for energy/manufacturing process conversion for hard-to-abate industries
		Facilitating introduction of hydrogen and ammonia	- Support focused on the price gap to build supply chains for hydrogen and its derivatives ("Support for building GX supply chains" also meets this criterion)
		Carbon Recycling and CCS	(No applicable project in this Bonds)
6	Environmentally sustainable	Food, agriculture, forestry, and fisheries industry	(No applicable projects in this Bonds)

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	management of living natural resources and land use, Circular economy	Resource circulation	- Support for enhancing the resilience and autonomy of circular economy systems through industry-government-academia collaboration - Investment promotion for advanced resource circulation
Cross-sectoral (applies to all green categories)			- Deep Tech Startup Support Program in the Green Transformation field - Capital for GX Acceleration Agency

The planned use of proceeds from this Bonds and classification by target area are as shown in the figure and the table below. While roughly half of the issue amount for the first series of Japanese Climate Transition Bonds (issued in FY2023) was earmarked for research and development funds [34], a notable feature of the second series of this Bonds (issued in FY2024) is that two-thirds of the total issue amount will be used to subsidize capital investments and other projects that contribute to reducing GHG emissions. In particular, the costs of subsidies are large for power semiconductors, which have become difficult to procure due to excessive demand in recent years, and for batteries, for which demand is expected to increase in the future. In addition, the amounts shown in the chart below are the budget amounts for each project, and funds will be allocated 1.4 trillion yen for projects whose initiatives and scale have been decided.

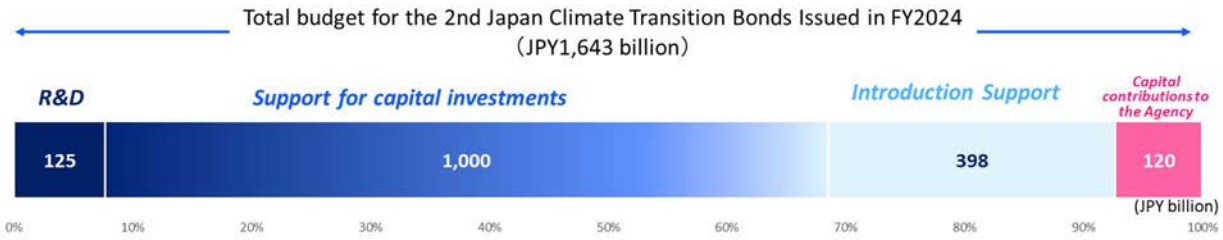

Figure 12: The amount-based breakdown of the use of proceeds for this Bonds (2nd issue) (by funded project type)[35]

[34]The total budget project funds to be used for the first bond will be 1.6089 trillion yen, of which 893.4 billion yen (55%) will be allocated to research and development funds. The total issue amount of the first series of bonds is 1,599.3 billion yen, and the amount allocated to each purpose will be reported in the funds allocation report.

[35] Created by JCR from materials provided by the Ministry of Economy, Trade and Industry.

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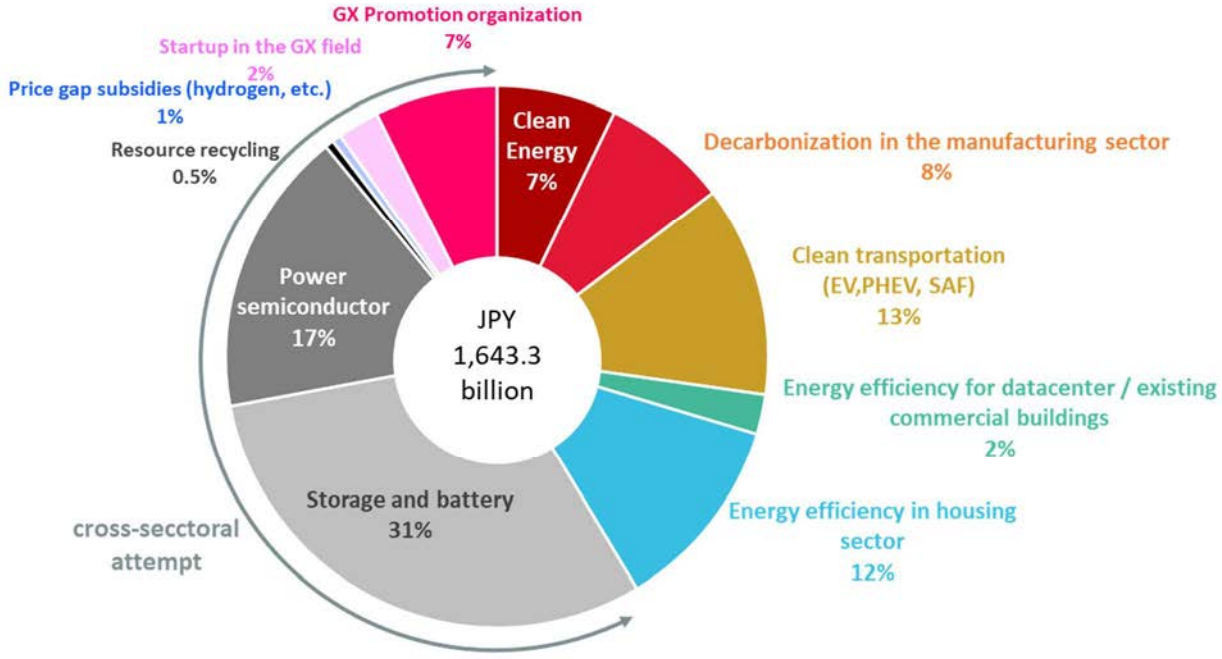

Figure 13: The budget amount for projects to for this Bonds (2nd issues) by sector[36]

*Figures 12 and 13 show the total budget amount for the projects covered by this Bonds, and the total amount of this Bonds issuance is planned to be 1.4 trillion yen. The actual amount allocated will be reported in the funds allocation report.

Table 5: Projects allocated to this Bonds[37]

	Budget Year	New/ continuation	Appropriated projects (including some potential projects)	Target Area	Project budget (JPY billion)
(1) Research and Development	2024	New	1. Deep Tech Startup Support Program in the Green Transformation field	Startup Support	41.0
	2024	Continuation	2. Development of test furnace of high temperature gas-cooled reactor	Clean Energy	27.4
	2024	Continuation	3. Development of test furnace of fast reactor	Clean Energy	28.9
	2023	Continuation	4. R&D for post-5G information communications system infrastructure enhancement	Semiconductors for AI	28,1
					125.4
(2) Support for capital investment	2023/ 2024	Continuation	5. Support for strengthening manufacturing supply chains of batteries	Battery Industry	495.8
	2024	New	6. Support for energy/manufacturing process conversion for hard-to-abate industries	Decarbonization of manufacturing	32.7
	2024	New	7. Support for establishing production and supply system of sustainable aviation fuel (SAF)	Clean Transportation	27.6
	2024	New	8. Support for enhancing the resilience and	Resource Recycling	3.5

[36] Created by JCR from materials provided by the Ministry of Economy, Trade and Industry.
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			autonomy of circular economy systems through industry-government-academia collaboration		
	2024	New	9. Support for building GX supply chains	Clean Energy	54.8
	2024	New	10. Investment promotion for advanced resource circulation	Resource Recycling	5.0
	2024	New	11. Promotion of the construction of zero-emission ships etc.	Clean Transportation	9.4
	2023	Continuation	12. Support for strengthening domestic production capacity of power semiconductors contributing to energy savings	Power Semiconductors	280.6
	2023	Continuation	13. Subsidy for energy saving investments/demand structure conversion	Decarbonization of manufacturing	91.0
					1,000.4
(3) Introduction Support	2024	New	14. Installation support for electricity storage systems such as grid-scale batteries to expand renewable energy usage	Battery Industry	8.5
	2024	Continuation	15. Regional decarbonization promotion grant	Clean Energy	6.0
	2023	New	16. Subsidy for promoting energy savings in households through installing high-efficiency water heaters	Energy conservation in the residential sector	58.0
	2023	Continuation	17. Subsidy for introducing clean energy vehicles	Clean Transportation	129.1
	2023	Continuation	18. Accelerating energy/emissions savings of housing through promoting renovations for insulated windows	Energy conservation in the residential sector	135.0
	2023	New	19. Accelerating decarbonizing renovations for commercial buildings	Energy conservation for data centers /existing commercial buildings	11.1
	2023	Continuation	20. Promotion of electrifying commercial vehicles	Clean Transportation	40.9
	2024	New	21. Support focused on the price gap to build supply chains for hydrogen and its derivatives	Price gap subsidies (hydrogen, etc.)	8.9
					397.5
(4) Capital contributions to the Agency	2024	New	22. Capital for GX Acceleration Agency	GX Acceleration Agency	120.0
					120.0
Total					**1,643.3**

*Table 5 shows the breakdown of the budget amounts for the projects covered by this Bonds, and the total amount of this Bonds is expected to be 1.4 trillion yen. The actual amount allocated will be reported in the funds allocation report.

In Table 5, projects that were newly added as a use of proceeds from this Bonds (issued in FY2024) are indicated as "New," while projects that were included in the use of proceeds from the first series of Japanese Climate Transition Bonds (issued in FY2023) and will continue in this Bonds

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(issued in FY2024) are indicated as "Continuation." Continuing operations include businesses that have different names but are identical in content. The ratio of new projects to continuing projects is as follows. In terms of the total budget amount, new projects: 381 billion yen, continuing projects: 1,263 billion yen, with continuing projects accounting for nearly 80per cent.

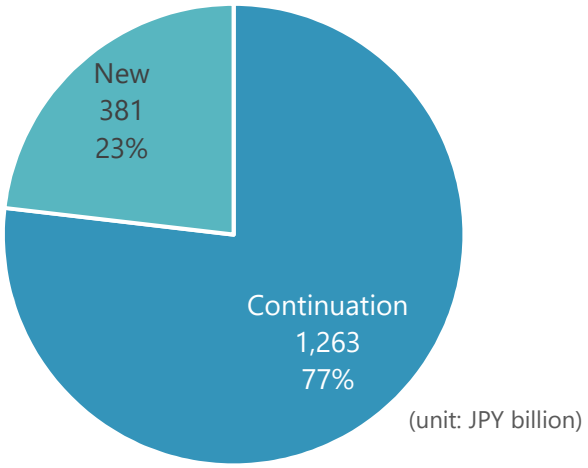

Figure 14: Proportion of new and continuing projects in this Bonds (based on budget amount)[38]

[38] Prepared by JCR from documents submitted by the Ministry of Economy, Trade and Industry

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2. Project overview and impact (environmental improvement effect)

The proceeds from this Bonds will be used for (1) research and development support, (2) subsidy programs to support capital investment, (3) subsidy programs for introduction support, and (4) capital contributions to the GX Acceleration Agency. In the light of the policy intent, the projects are classified into the following four themes: (A) Innovative R&D to gain new markets, (B) Capital investment that contributes to both emissions reduction and economic growth, (C) Creating demand at a national level for economic growth, and (D) Cross-cutting efforts to realize GX. The outline of each project and its environmental benefits are detailed below. JCR has confirmed that the use of proceeds from this Bonds meet the eligibility criteria, which have been confirmed in the framework evaluation for both eligibility and environmental benefits. JCR also confirmed that all grant program recipients are required to submit their direct and indirect GHG emissions, as well as GHG emission reduction targets for 2030 and other GHG emission reduction initiatives, in a pre-defined format, as part of the GX League membership requirements. Therefore, JCR assesses that all of the uses of proceeds planned for this Bonds are important projects for achieving net zero by 2050 and the intermediate target of 2030, which has been set as a milestone.

(1) Research and development support projects

Use of proceeds 1: Deep Tech Startup Support Program in the Green Transformation field

ICMA GBP Classification	"Renewable energy", "Energy efficiency", "Clean transportation", " Circular economy adapted products, production technologies and processes and/or certified eco-efficient products", "Environmentally sustainable management of living natural resources and land use".
GB Guidelines	"Projects for renewable energy," "Projects for energy efficiency," "Projects for clean transportation," "Projects concerning production technologies and processes and environmentally friendly products for the circular economy," and " Projects for the sustainable management of living natural resources and land use."
Policy Intention	(A) Innovative R&D to gain new markets
Background/ Objective	In order to promote the technological innovation necessary to achieve net-zero and to promote market growth in the GX industry and corporate GX, it is necessary to accelerate the growth of startups in the GX field. In Japan, the Five-Year Startup Development Plan[39] outlines a policy to create an ecosystem in Japan that produces and nurtures startups and realize a second startup boom, with the aim of transforming social issues into engines of growth and realizing a sustainable economic society. To achieve this, goals have been set such as increasing investment in startups by more than 10 times the current level in five years and creating 100 unicorns in the future. Among startups, so-called "deep tech startups" require long-term research and development and large amounts of capital before the technology can be established, and the risk of commercializing the business is high. However, as the international community faces diverse and difficult social challenges, the innovative technologies possessed by deep tech startups could help resolve these issues, and they also have the potential to realize growth for Japan's economy by creating new companies and industries backed by innovative technology. In particular, as shown in the figure below (next page), Japan has many internationally competitive technologies in the GX sector, but is lagging behind in international competition at the social implementation stage in the GX sector. Therefore, in order to quickly implement a wide range of technological seeds, we recognize the importance of utilizing startups in terms of

[39]New Capitalism Realization Council "Startup Development Five-Year Plan" (November 28, 2022)
https://www.cas.go.jp/jp/seisaku/atarashii_sihonsyugi/kaigi/dai13/shiryou1.pdf

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	flexible research and development systems that take market trends into account, access to risk capital, etc. **Total patent asset 2010-2019**[40] In the GX sector, there are many businesses that utilize the aforementioned deep tech, but there are significant barriers in terms of demand and fundraising between the time when startups are created based on technological seeds, the time when these startups conduct research and development, and the time when they can realize social implementation. The purpose of this project is to support the efforts of each company in order to resolve these issues and strongly encourage startups to implement GX-related technologies as soon as possible, so as to avoid "winning in technology but losing in business."
Business summary	This program will target projects that meet the following three criteria: (i) there is a specific technology seed and it is expected that there will be an R&D element; (ii) it will be possible to create innovations that will strengthen competitiveness; and (iii) it will be possible to create innovations that will achieve carbon neutrality on a global scale and strengthen Japan's industrial competitiveness, for example by setting ambitious targets for reducing CO_2 emissions based on the GX Promotion Strategy. This program has three options:: [1] STS Phase (Seed-stage Technology-based Startups, practical research and development (first half)) In addition to research and development of core technologies and development of prototypes, government will support the implementation of feasibility studies to determine the direction of technological development toward commercialization. ・Subsidy amount: up to 300 million yen or up to 500 million yen (※) / Project period: Approximately 1.5 to 2 years (however, up to 4 years within the same phase) ※When collaborating with operating companies or conducting overseas technology demonstrations [2] PCA Phase (Product Commercialization Alliance, practical application research and development (later stage)) In addition to developing prototypes and initial production technology, the company will also support the implementation of feasibility studies aimed at capturing major markets. ・Subsidy amount: up to 500 million yen or up to 1 billion yen (※) / Project period: Approximately 1.5 to 2 years (however, up to 4 years within the same phase) ※When collaborating with operating companies or conducting overseas technology demonstrations [3] DMP Phase (Demonstration development for Mass Production) It will support the implementation of demonstrations necessary for commercialization through research and development on mass production technology, as well as the design, manufacture, purchase, introduction, and operation of production and inspection equipment for mass production.

	Cars/ Storage batterie	Hydroge n	Semico nductor /IT	House/ building s solar panel	Offshor e wind power	Carbon recyclin g	Ships	Nuclear	Fuel Ammoni a	Logistic s/ infrastr ucture	aircraft	Circular econom y
Japan	**41,031**	**10,408**	**8,374**	253	487	1,137	208	66	111	645	24	442
China	19,664	7,189	7,799	108	1,418	1,730	205	221	133	4,146	37	3,563
Korea	16,488	4,084	2,238	130	302	490	331	27	11	923	5	457
U.S.	17,888	4,447	8,126	140	402	1,727	231	339	188	1,772	155	1,636
Germa ny	7,399	1,851	1,899	12	70	334	196	15	103	355	6	158
France	2,999	1,133	731	20	16	387	32	28	8	171	69	173
U.K.	493	770	243	13	5	69	52	66	21	65	9	79

[40] Created by JCR based on the Ministry of Economy, Trade and Industry's "Guidance for creating and growing GX startups ~Securing initial demand and diversifying financing~"
https://www.meti.go.jp/policy/energy_environment/global_warming/gx_startup/gx_guidance.pdf

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	・Subsidy amount: Up to 2.5 billion yen / Project period ・Project period: Approximately 1.5 to 2 years (however, up to 4 years within the same phase)
Development Goals	[1] STS phase: The product or service solves a problem for intended customers in the initial market. [2] PCA phase: The product or service solves problems for target audiences in the initial market and beyond in the mainstream market, and meets the requirements to generate ongoing revenue. [3] DMP Phase: The products and services are targeted to the main market (mainstream) Necessary to solve the problems and build a business model that can start commercial production and secure continuous income Once the requirements are met, the next round of funding will see the company move into actual mass production.
Technology Maturity Targets	TRL5 (STS phase), TRL6 (PCA phase), TRL7 (DMP phase) * Please note that the TRL assumed for each phase varies depending on the characteristics of the technical field and business domain, so it is a guideline.
Impact	The goal is to accelerate the business growth of startups in the GX field. In the short term, the program is aimed to have 50% of those who have raised funds for the next round of funding within one year of the end of support. In the medium term, it is aimed to start large-scale commercial production, etc., and in the long term, it is aimed to promote GX and create and develop a GX startup ecosystem
Subsidy rate	[1] STS Phase: Grant rate: 2/3 or less [2] PCA Phase: Grant rate: 2/3 or less [3] DMP Phase: Grant rate: 2/3 or less or 1/2 or less
Related Links	https://www.nedo.go.jp/activities/ZZJP_100250.html https://www.nedo.go.jp/koubo/CA2_100460.html (Reference) Ministry of Economy, Trade and Industry “Guidance for the creation and growth of GX startups: Securing initial demand and diversifying financing” https://www.meti.go.jp/policy/energy_environment/global_warming/gx_startup/gx_guidance.pdf

Use of proceeds 2: Development of test furnace of high temperature gas-cooled reactor (Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP classification[41]	“Low carbon/decarbonized energy”
GB guidelines	“Projects concerning eco-efficient products, production technologies, and processes”
Policy Intention	(A) Innovative R&D to gain new markets
Background/ Objective	A high-temperature gas reactor is a nuclear reactor that uses ceramic materials, mainly graphite, as the main constituent material of the reactor core, and uses helium gas as a coolant to extract the heat generated by nuclear fission. A high-temperature gas furnace with an outlet coolant temperature of 700°C to 950°C is called a high-temperature gas furnace. By using a ceramic material with excellent heat resistance, it is possible to extract energy from high-temperature heat of over 700°C, which has the potential to be used for energy generation or to produce hydrogen using a high-temperature gas furnace. Regarding hydrogen production, which is attracting attention for decarbonization in industrial fields including steelmaking and chemicals, it has the potential to decarbonize a shaft furnace that can perform complete hydrogen reduction steelmaking with a single high-temperature gas furnace. There is. Comparing hydrogen production using a high-temperature gas furnace and solar energy generation, the required site area is approximately 1/1,600th. In Japan, JAEA owns the High Temperature Engineering Test and Research Reactor (HTTR). The test research reactor HTTR achieved 50 days of continuous high-temperature operation at the world’s highest temperature of 950°C, and conducted tests simulating an accident in which

[41]Since there is no example of the green project classification for the use of this fund in ICMA's GBP, it was established at the time of formulating Japan Climate Transition Framework.

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	coolant was lost, similar to the TEPCO Fukushima Daiichi Nuclear Energy Plant accident. It has the world's leading technology, including ensuring that water cools naturally. Utilizing the test and research reactor HTTR, in addition to international demonstrations of safety, it plan to develop the technology necessary to produce large quantities of carbon-free hydrogen at low cost by 2030. It also plan to conduct research and development on carbon-free hydrogen production methods that utilize ultra-high temperature heat, including the IS method and methane thermal decomposition method. In order to achieve the government's goal of net-zero by 2050, it is essential to reduce emissions from the industrial sector, including steel and chemicals, which account for approximately 25% of total domestic emissions. As mentioned above, high-temperature gas reactors are expected to be used for high-temperature heat utilization of 800°C or higher, which is higher than conventional light water reactors, and for industrial applications such as hydrogen production. In Japan, the aforementioned test and research reactor HTTR has been restarted, and it are now at the stage where it can develop a demonstration reactor with the aim of commercialization as a means of decarbonizing heat demand and hydrogen production. Through this project, it aim to provide a stable supply of large amounts of hydrogen at approximately 12 yen/Nm^3 by 2050 using decarbonized high-temperature heat over 800°C and carbon-free hydrogen production methods. The ultimate goal is to connect it to industrial use.
Business summary	In order to develop hydrogen production evaluation technology, hydrogen production tests will be conducted using the High Temperature Gas Reactor Test and Research Reactor HTTR, which has achieved the world's highest temperature of 950°C as a high-temperature heat source. In addition, it will design and construct a high-temperature gas reactor demonstration reactor, develop elemental technologies, and consider supply chains such as fuel production. In FY2024, manufacturer system preparation, basic design of hydrogen plant connected to HTTR, and equipment development and elemental technology development for carbon-free hydrogen will be carried out in preparation for the conceptual design of a demonstration reactor. Furthermore, a procurement feasibility study for ultra-high temperature materials will be conducted.
Development Goals	This project will conduct a feasibility study of carbon-free hydrogen production methods that utilize high temperatures of 800°C or higher (IS method, methane pyrolysis method, high-temperature steam electrolysis, etc.) by 2030. The goal is to establish connection technology and evaluation methods that achieve high safety using a decarbonized high-temperature heat source and hydrogen production technology using the commercially available methane steam reforming method.
Technology maturity goals	TRL6 or higher (2030)
impact	By 2030, it will establish connection technology between high-temperature heat sources and hydrogen production plants and demonstrate that hydrogen production is possible. It will also gain an outlook on the technological feasibility of carbon-free hydrogen production methods (IS method, methane pyrolysis method, high-temperature steam electrolysis, etc.). ・Achieve the tasks set for each FY year to confirm the connection technology between ultra-high temperature heat sources and hydrogen production facilities. ・By the end of the project in FY2022, technology for evaluating hydrogen production should be established, and the design tolerance should be within ±10% of the error between predicted and measured values.
Related URLs	https://www.meti.go.jp/main/yosan/yosan_fy2023/pr/gx/gx_denga_02.pdf

Use of proceeds 3: Development of test furnace of fast reactor

(Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP classification	"Low carbon/decarbonized energy"
GB guidelines	N.A.
Policy Intention	(A) Innovative R&D to gain new markets
Background/ Objective	A fast reactor is a nuclear reactor in which the fission chain reaction is sustained by high-energy neutrons (fast neutrons). Since fast neutrons cause nuclear fission of the fuel, in order to avoid

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	deceleration of fast neutrons as much as possible, moderators like those in light water reactors are not required, and fuel with increased fuel density in the fuel assembly is used. Fast reactors utilize fast neutrons to further enhance the effectiveness of the nuclear fuel cycle by reducing the volume and toxicity of such high-level radioactive waste and making effective use of resources. Fast reactors do not require moderators, but use liquid metals, mainly sodium, as coolants for fuel assemblies. Furthermore, after a light water reactor finishes generating electricity, the spent fuel contains resources that can be recycled, such as uranium and plutonium. By collecting and reprocessing these and reusing them as fuel for fast reactors, a long-term stable supply of energy becomes possible. When reprocessed fuel is used in light water reactors (light water reactors pullthermal), the less flammable plutonium (high-grade plutonium) gradually increases, so it can be reused as fuel only a few times, whereas fast reactors also burn the less flammable plutonium. It plays an extremely important role in the effective use of resources. In addition, fast reactors are expected to further enhance the effectiveness of the nuclear fuel cycle in reducing the volume and potential toxicity of radioactive waste and in effectively utilizing resources. Based on the above, the purpose of this project is to support research and development such as the conceptual design of fast reactors and the development of technological infrastructure that can be applied to demonstration reactors.
Business summary	A sodium-cooled fast reactor (SFR) is a moderator-less fast reactor that uses liquid metal sodium as a coolant. In the fast reactor strategic roadmap revised in December 2022, a fast reactor technology evaluation committee was established under the strategic working group established by the government, manufacturers, electric energy companies, and research institutions. As a result of the committee's consideration of sodium-cooled reactors, light water-cooled fast reactors, and molten salt fast reactors as candidates, sodium was selected as the coolant that should be prioritized for development. The liquid metal sodium used as a coolant reacts violently with water and burns, so it must be handled with great care. The milestones for this project are as follows. 1） Summer 2023: Select specifications for the reactor concept and core companies for conceptual design from 2024 onwards Based on the coolants that should be prioritized for development in FY2022, and based on the results of subsequent technical studies, the international situation, and domestic market needs, from among the sodium-cooled reactors, conceptual design will begin in FY2024. In addition to selecting the specifications for the new reactor concept, it will also reselect a core company that will be responsible for the design of the concept, associated technological development, and future manufacturing and construction, and clarify the development system. In addition, measures to maintain human resources, technology, and supply chains will be implemented. 2） FY2024 to FY2028: Conceptual design of demonstration reactor and necessary research and development The core companies will conduct the conceptual design of the demonstration reactor. First, it will carry out the conceptual design of the plant, while conducting necessary research and development (evaluation of a decay heat removal system that can respond to various situations, evaluation of the conclusion of a core meltdown accident inside the reactor vessel, irradiation tests for advanced fuel, data maintenance to set standards for new materials etc.) and gain knowledge through research and development results and international cooperation around 2026. Based on this, it will conduct specific studies on fuel technology and develop the system as a whole, including plants and fuel. The conceptual design will be carried out by around 2028. 3) Around FY2028: Decision to move to Step 3 based on the results of the reactor conceptual design and the status of system development, etc. In moving to Step 3, in addition to creating a common understanding among related parties to build a system, it will fulfill its accountability to ensure that the technology is accepted by society, and it will also take specific measures regarding location measures and regulatory responses. It is necessary to consider how to respond. It is also essential that an appropriate business management system be established. If the market mechanism does not work properly, it is necessary to verify that the long-term interests of the people can be secured, and then, as with other energy sources, appropriate

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	institutional measures to supplement the market are needed. It is appropriate that various adjustments with the location area should be carried out by the established business management system, in collaboration with the government and electric utilities with experience in locating light water reactors. The government will provide institutional support in cooperation with electric utilities and the location regions. In addition, it is important to build a mechanism that can raise development funds in an appropriate business management system in collaboration with electric utilities, who are the final users of nuclear energy generation technology, and the government is creating an environment in which such a mechanism can function. Based on the status of these considerations, it will make a decision to move to Step 3 around FY2028, and proceed with the outlook and consideration of activities from around FY2030 onwards.
development goals	Goals by 2028 a. Technology maturity level (TRL) ・Present an evaluation plan that will contribute to licensing regarding the safe design of fast reactors. In addition, the technological maturity of the elemental technologies for fast reactors and fast reactor cycles shall be at the technology demonstration stage (TRL6) or higher. b. Economical aspects ・In a cost evaluation assuming a plant that is a large reactor and takes into account learning effects, etc., it is considered to be equivalent to a light water reactor. - Continuous operation period of 13 months or more, availability rate of 80% or more, net energy efficiency of 35% or more, and plant life of 60 years. ・At a breeding ratio of 1.03, the average extraction burnup of the entire core will be 80 GWd/t. c. Reducing the volume of radioactive waste and reducing its potential toxicity ・The average MA content in the core is approximately 3wt% (the maximum MA content in the fuel assembly is 5% or less). d. sustainability ・While ensuring a breeding ratio of 1.03, taking into account the uncertainty of Pu supply and demand, secure the potential to operate a core configuration with a breeding ratio of 1.1 to 1.2. e. flexibility - Flexibly respond to output scale and location conditions. ・Consider specific operational methods (heat storage, etc.) that can coexist with variable renewable energy such as solar and wind energy. f. In preparation for regulatory compliance and consultation with regulations, clarify important issues, begin exchanging opinions, and present research and development plans for Step 3 and beyond.
Technology maturity goals	TRL6 or higher (2028)
Impact	・Technology maturity level at which transition to Step 3 can be determined. ・It expect to rebuild the supply chain through the development of fast reactors and fast reactor cycles in the conceptual design, and to cultivate skills and promote employment in the industrial world after Step 3. ・Obtain permit data and present an acquisition plan so that the business management system from Step 3 onward can make construction decisions.
Related URLs	https://www.meti.go.jp/shingikai/enecho/denryoku_gas/genshiryoku/kakushinro_wg/pdf/007_01_00.pdf

Use of proceeds 4: R&D for post-5G information communications system infrastructure enhancement

(Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP classification	"Energy efficiency"
GB guidelines	“Projects for energy efficiency”
Policy Intention	(A) Innovative R&D to gain new markets

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Background/ Objective	Fifth-generation mobile communication systems (5G) are more advanced than fourth-generation mobile communication systems (4G), and feature enhanced functions such as ultra-low latency and multiple simultaneous connections. By developing core technologies for new information and communications systems that are compatible with 5G (post-5G), we aim to strengthen Japan's development and manufacturing base for 5G information and communications systems and to achieve both a digital society and decarbonization.
Business summary	This project is broadly divided into two parts: (1) Development of post-5G information and communications systems The project will support technological development for the entire information and communications network and each of its constituent elements (core network, transmission paths, base stations), as well as basic models for generative AI, which is considered to be the killer application of post-5G information and communications systems. (2) Development of cutting-edge semiconductor design and manufacturing technologies We will support the development through international collaboration of fundamental technologies in which Japan has an advantage, such as cutting-edge semiconductor system design technology, the mounting technology required for manufacturing, and miniaturization-related technologies, as well as next-generation semiconductor manufacturing technologies. Of these, the following two projects can be used for this Bonds proceeds: ● Development of packaging technology related to photonics-electronics convergence and deterministic latency computing platform technology ...Optical chiplet implementation technology, which implements multiple circuit chips such as CPU/GPU/memory connected by photoelectric conversion devices using photonics-electronics convergence technology that combines circuits that handle electrical signals with circuits that handle optical signals, within a semiconductor package, makes it possible to connect computing resources such as CPUs, memories, and xPUs directly over long distances with high speed and low loss without using electrical wiring. In this project, it will develop optical chiplet mounting technology and the peripheral technologies required for its implementation. ● Development of manufacturing technology for next-generation wideband, low-power HBM ...In post-5G information and communications systems, in order to cope with the increase in data processing volume in data centers and the increase in calculation processing in AI processing, the performance of processors is improving and the importance of wideband memory (HBM), which transfers data between processors at high speeds, is increasing. Demand for AI is expected to continue to increase in the future, which will require even higher bandwidth for memory. At the same time, it is expected that the power consumption associated with memory transfers will become enormous, so technology that can achieve this with low power consumption will be required. Therefore, it is developing wideband, low-power HBM manufacturing technology.
Development Goals	The following quantitative targets have been set for individual development projects in each business category. ● Development of packaging technology related to photonics-electronics convergence and deterministic latency computing platform technology ...Power consumption is reduced by 30-40% or more (compared to equivalent technologies or products that were in widespread use at the time research and development began). ● Development of manufacturing technology for next-generation wideband, low-power HBM ⋯Power consumption is reduced by 30% or more (compared to equivalent technologies or products that were in use at the time research and development began)
Technology Maturity Targets	TRL6-9
Impact	More than 50% of technologies developed in the project will be put to practical use
Related URLs	https://www.meti.go.jp/policy/mono_info_service/joho/post5g/pdf/20230925001.pdf https://www.meti.go.jp/policy/mono_info_service/joho/post5g/pdf/20240329_keikaku.pdf

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(2) Subsidy programs to support capital investment

Use of proceeds 5: Support for strengthening manufacturing supply chains of batteries (Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP Classification	"Energy efficiency," "Renewable energy," and "Clean transportation."
GB Guidelines	"Projects for energy efficiency," "Projects for renewable energy," and "Projects for clean transportation"
Policy Intention	(A) Innovative R&D to gain new markets, (B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	Batteries are essential for maintaining the foundation of the electrified and digitalized society of the future, for example, for the electrification of automobiles and other forms of mobility, for adjusting supply and demand to make renewable energy the primary power source, and as backup power sources for 5G communication base stations and other facilities. While demand is expected to continue to expand in the future, Japan's share is declining. Given this background, this project aims to strengthen the domestic battery manufacturing supply chain, including small and medium-sized enterprises, by supporting capital investment and technological development in batteries, and materials, and manufacturing equipment.
Business summary	In order to strengthen the manufacturing supply chain of batteries and ensure a stable supply, the following measures will be taken. (1) Support for capital investment in batteries, materials, and manufacturing equipment. In order to strengthen the domestic manufacturing base for batteries, materials and manufacturing equipment subsidies will be provided to businesses that develop large-scale manufacturing bases, manufacturing bases for parts and materials whose production in Japan is currently limited, and manufacturing bases that use unique technologies. (2) Support for technological development of batteries, materials and manufacturing equipment. Subsidies will be provided to businesses that develop technologies to establish the superiority and indispensability of batteries, materials, and manufacturing equipment technologies to decarbonize the manufacturing process, and digital technologies to manage data in the manufacturing process and improve productivity.
Subsidy rate	Investment in manufacturing facilities for in-vehicle and stationary batteries, and support for technical development = 1/3, technology = 1/2 However, the upper limit for capital investment by small and medium-sized enterprises related to the development of manufacturing infrastructure for battery manufacturing equipment is 1/2.
Related URLs	https://www.meti.go.jp/policy/economy/economic_security/battery/

Use of proceeds 6: Support for energy/manufacturing process conversion for hard-to-abate industries

ICMA GBP Classification	"Energy efficiency", "Circular economy adapted products, production technologies and processes"
GB Guidelines	"Projects for energy efficiency," "Projects concerning production technologies and processes and environmentally friendly products"
Policy Intention	(B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	Aiming for carbon neutrality by 2050, to reduce emissions from energy and manufacturing processes of hard-to abate sectors, such as steel, chemicals, and pulp and paper, and to strengthen industrial competitiveness are inevitable. For the characteristics of each industry and their efforts toward decarbonization, please refer to pages 42-46 of the JCR Evaluation Report on the Japan Climate Transition Bond Framework published on November 7, 2023.[42]

[42]November 7, 2023 JCR "Japan Climate Transition Bond Framework" Evaluation Report
https://www.jcr.co.jp/download/d7ecdb849999ae618186f0c18658fc88688ff72d8700580e8c/23d1036_2.pdf

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Business summary	(1) Manufacturing process conversion project It will support capital investment to transition from conventional manufacturing processes that involve large amounts of CO_2 emissions to new low-emission manufacturing processes. a. Steel Conversion from blast furnaces and converters to innovative electric furnaces, and introduction of a steelmaking process that utilizes hydrogen. For example, (i). Hydrogen reduction by blast furnace method; Reduce iron ore using hydrogen instead of carbon. CO_2 is used for CCUS or methanation. (ii). Direct hydrogen reduction; Reducing low-grade iron ore using only hydrogen without using coal. Steel is produced by melting the manufactured pellets in an electric furnace. (iii). Switching from blast furnace to electric furnace; Reduced iron and iron scrap are melted in an electric furnace to manufacture steel products. It is developing technology to remove impurities (phosphorus, copper, etc.) at that time. b. Chemical Switching to chemical recycling processes that utilize waste plastics and reduce the amount of naphtha used, and switching to bio-based raw materials produced from plants and other sources that have low emissions throughout their life cycle. In order for realizing carbon neutrality in chemical sector, (i). Fuel conversion: replace the coal to ammonia, etc., in the naphtha cracking process (ii). Process conversion: replace naphtha oriented raw materials to bio-ethanol, waste plastic, etc. to make chemical products. Overseas company, like BASF, started to calculate CFP of chemical products to seek for lower CF products. Considering the introduction of CBAM, it is necessary to enlarge the supply of lower carbon chemical products, in addition to high quality, which is the base of Japan's high competitiveness. c. Paper and pulp Shift to a bio-refinery business that utilizes wood pulp, which has the potential to be an alternative material to fossil fuel-derived products In order for realizing carbon neutrality in paper and pulp sector, (i). Fuel conversion: replace coal to black liquor, which is generated during the chemical breakdown and separation of wood pulp production. (ii). Process conversion: to develop new business such as bio-refinery (cellulose, CNF, bio-ethanol, etc.) It is necessary to transform from paper and pulp industry to become bio-refinery industry, which lead this industry survive. In order to do so, collaboration with different industries to enjoy the scale merits. d. Cement Expanding the production of carbon recycled cement through fuel conversion in the firing process and coal-fired boilers, and implementing technology to capture CO_2 generated during cement manufacturing (conversion of raw materials). In order for realizing carbon neutrality in cement industry, (i). Fuel conversion: replace calcination process and coal fired power plants to waste and biomass fuel. (ii). Raw material conversion: Recycling waste concrete, which enables CO_2 collection a recycling in the process of producing cements with net zero emission (2) Fuel conversion for in-house power generation facilities, etc. Converting to fossil fuels to low carbon fuel that contribute to significant emission reductions in coal-fired in-house power generation facilities, boilers, etc. in the hard to abate sectors. Regarding the fuel conversion measures from coal set out in the Sector-specific Investment Strategies, the main ones cited are ammonia for chemicals, black liquor and biomass for paper and pulp, and waste-to-energy and biomass for cement. In the cement sector, according to the carbon neutral strategies published by major Japanese cement companies, waste, hydrogen, ammonia combustion, synthetic methane, etc. are envisaged as fuels for conversion.

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Subsidy rate	Subsidize one-third of capital investment plans.
Related URLs	Steel https://www.meti.go.jp/press/2023/12/20231222005/20231222005-01.pdf Chemical https://www.meti.go.jp/press/2023/12/20231222005/20231222005-02.pdf Paper and pulp https://www.meti.go.jp/press/2023/12/20231222005/20231222005-03.pdf Cement https://www.meti.go.jp/press/2023/12/20231222005/20231222005-04.pdf

Use of proceeds 7: Support for establishing production and supply system of sustainable aviation fuel (SAF)

ICMA GBP Classification	"Clean Transportation"
GB Guidelines	"Projects for Clean Transportation "
Policy Intention	(B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	Sustainable Aviation Fuel (SAF) is attracting attention as a decarbonized fuel that will play an important role in enabling decarbonization in large aircraft, where electrification and hydrogenation are difficult. SAF is aviation fuel produced from sustainable sources other than fossil fuels, such as used cooking oil and animal and vegetable oils, and is said to be able to reduce CO_2 emissions by about 60% to 80% compared to conventional fossil fuels.[43] According to the Sector-specific Investment Strategies compiled by the Japanese government, the global supply of SAF in 2022 is estimated to be approximately 300,000 kl (approximately 0.1% of the global jet fuel supply). Meanwhile, IATA, an industry association made up of airlines around the world, has announced a goal of achieving net-zero total CO_2 emissions from the air transport sector by 2050.The amount of SAF needed to achieve net-zero emissions in 2050 is estimated to be 449 billion liters (= 450 million kl), which is 1.5 times the world's jet fuel supply as of 2022. The Clean Skies for Tomorrow Coalition, a World Economic Forum group that aims to promote the introduction of SAF, has declared that it will increase the proportion of SAF in the fuel used in the global aviation industry to 10% by 2030. In addition, Oneworld has declared that all of its member companies, and each airline, will replace 10% of the fuel they use with SAF. As demand for SAF increases internationally, the aim of this initiative is to build domestic supply capacity for SAF, thereby aiming to supply domestically and to Asian countries where aviation demand is expanding, as well as to ensure security by producing aviation fuel in-house. In particular, with an eye towards a decarbonized society, oil refiners are moving away from traditional oil refining and sales and toward the green chemical industry by applying fuel production technologies such as SAF, which is expected to help support the oil industry's transition to a decarbonized business.
Business summary	Support for capital investment etc. in large-scale domestic SAF manufacturing. Among the types of raw materials and technologies for domestic SAF production that are eligible for the subsidy, there is no restriction on specific technologies, but the first step in creating a GX market in the Sector-specific Investment Strategies is to simultaneously build a support system for obtaining international certification through an evaluation of environmental sustainability and GHG emissions.

[43] Based on CO_2 emissions throughout the life cycle (including emissions during processes such as cultivation, harvesting, manufacturing, and transportation of raw materials). In addition, since the ASTM standard currently stipulates an upper limit on the amount of diesel that can be mixed with conventional fuels, the actual CO2 reduction effect will be lower than the above value.

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	Types of SAF by raw materials and technologies <table><tr><td>Manufacturing technology</td><td>Major raw materials</td></tr><tr><td>HEFA (Hydroprocessed Esters and Fatty Acids)</td><td>Used cooking oil, Ghee, Pongamia, Microalgae, etc.</td></tr><tr><td>ATJ (Alcohol to Jet)</td><td>1st generation bioethanol (Sugar cane, Corns, etc.) 2nd generation bioethanol (non-edible plants、waste paper、other wastes)</td></tr><tr><td>gasification、FT synthesis</td><td>Garbage (waste plastics, etc.)</td></tr><tr><td>Synthesis fuel</td><td>CO_2、Hydrogen</td></tr></table>
Subsidy rate	1/3 or 1/2
Related URLs	4th Public-Private Council for Promoting the Introduction of Sustainable Aviation Fuel (SAF) Secretariat Document https://www.meti.go.jp/shingikai/energy_environment/saf/pdf/004_05_00.pdf Reference to the Sector-specific Investment Strategies (SAF) https://www.meti.go.jp/press/2023/12/20231222005/20231222005-08.pdf

Use of proceeds 8: Support for enhancing the resilience and autonomy of circular economy systems through industry-government-academia collaboration

ICMA GBP Classification	"Pollution prevention and control", "Circular economy adapted products, production technologies and processes"
GB Guidelines	"Projects for pollution prevention and control," "Projects concerning production technologies and processes and environmentally friendly products for the circular economy"
Policy Intention	(B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	Of the GHG emissions in Japan, emissions from sectors where there is room for contributing to reduction through resource circulation amounted to 413 million t-CO_{2e} (approximately 36% of total emissions) in FY2020. Approximately 80% of GHG emissions from Japan's waste sector come from waste incineration (simple incineration, heat recovery, and use of raw materials and fuels) and other processes. In order to reduce GHG emissions associated with incineration, etc., it is important to increase the use of recycled resources (recycled materials, renewable resources, etc.). The effect of reducing CO_2 emissions by using recycled materials from each materials is quite significant; e.g. recycled aluminum cans reduce 66%, recycled steel reduce 79% of emission, compared to virgin material. (Please refer page 12 in "Reference to the Sector-specific Investment Strategies (Resource Circulation)" (Japanese, the related URL below). In order to promote more resource recycling, METI formulated the "Growth-oriented Resource Autonomous Economy Strategy" in March 2023.[44] This strategy aims to control the risk of international supply disruptions, including for general-purpose industrial and consumer goods, as much as possible by restructuring resource circulation economy policies, and to make the domestic resource circulation system more autonomous and resilient, while achieving sustainable and steady growth through the acquisition of international competitiveness.

[44]Ministry of Economy, Trade and Industry, "Growth-oriented Resource Independent Economic Strategy" (March 2023) https://www.meti.go.jp/press/2022/03/20230331010/20230331010.html

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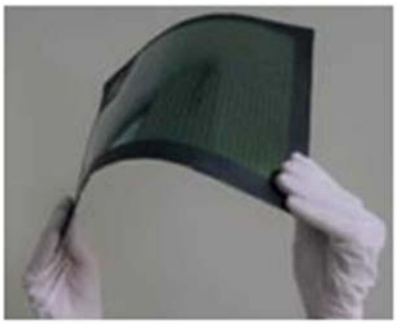
	In addition, based on this strategy, in order to strengthen industry-government-academia collaboration toward the realization of a circular economy, the industry-government-academia partnership "Circular Partners: CPs" on the circular economy was launched in September 2023. Through organic collaboration among related entities such as related organizations and organizations, the transition to a circular economy will be accelerated.
Business summary	Utilizing the framework of the " Circular Partners: CPs," it will support the following capital investments, etc., in order to realize initiatives that achieve both decarbonization and economic growth at an early stage toward the creation of a new resource recycling market.. (1) Development and demonstration of technologies related to resource circulation through arterial and venous linkages for automobiles and batteries, electrical and electronic products, packaging, plastics, textiles, etc. Conceptual image of a "resource circulation market through collaboration between arteriovenous and venous industries" (2) Development, demonstration, and commercialization of technologies for "recycling-conscious manufacturing" that contributes to ensuring longer life and easier recycling for automobiles and batteries, electrical and electronic products, packaging, plastics, textiles, etc.
Subsidy rate	1/3 or 1/2
Related URLs	Reference to the Sector-specific Investment Strategies (Resource Circulation) https://www.meti.go.jp/press/2023/12/20231222005/20231222005-11.pdf

Use of proceeds 9: Support for building GX supply chains

ICMA GBP Classification	"Renewable energy"
GB Guidelines	"Projects for renewable energy "
Policy Intention	(B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	As an increasing number of countries and regions declare carbon neutrality, long-term and large-scale investment competition is intensifying toward GX, which will achieve both emission reductions and enhanced industrial competitiveness and economic growth. Against this background, the aim is to make maximum use of the strengths of Japan's manufacturing supply chains, including those of small and medium-sized enterprises, and technological infrastructure, and to build a domestic manufacturing supply chain for the renewable energy business, which is essential for realizing GX.
Business summary	Support will be provided for capital investment by manufacturers planning large-scale investments in electrolyzer, floating offshore wind power generation equipment, perovskite solar cells, fuel cells, etc., as well as related components, materials, and manufacturing equipment, for manufacturers that currently have components, materials, or unique technologies with limited domestic production. ● Perovskite solar cells This is a new type of solar cell that uses a crystalline material called perovskite, and is a next-generation solar cell that can be installed on the walls of buildings, etc. 

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	● Main components and materials for offshore wind power generation equipment
Subsidy rate	1/3 or 1/2
Related URLs	Reference to the Sector-specific Investment Strategies (Next-Generation Renewable Energy) https://www.meti.go.jp/press/2023/12/20231222005/20231222005-14.pdf

Use of proceeds 10: Investment promotion for advanced resource circulation

ICMA GBP Classification	"Pollution prevention and control", "Circular economy adapted products, production technologies and processes"
GB Guidelines	"Projects for pollution prevention and control," " Projects concerning production technologies and processes and environmentally friendly products for the circular economy"
Policy Intention	(B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	Resource recycling is an important element in making effective use of limited resources and resolving waste problems both domestically and internationally. The purpose of this project is to promote both the transition to a circular economy and the decarbonization of the resource circulation sector by investing in (1) resource circulation facilities that will make a significant contribution to reducing emissions in industries where it is difficult to reduce CO_2 emissions, and (2) recycling facilities that will supply high-quality regenerated products that are essential for the refinery of innovative GX products.
Business summary	1) Emission reduction contribution projects for industries where it is difficult to reduce CO_2 emissions Support for the demonstration and implementation of large-scale, advanced separation and recovery equipment for waste plastics, metals, etc., and recycling equipment. 2) High-quality refurbished products supply business for innovative GX products Support resource circulation initiatives that supply the raw materials for innovative products (e.g., batteries) needed for the GX transition. Specifically, this refers to demonstration and capital investment that contributes to the establishment of resource circulation through collaboration between the manufacturing industry and the resource circulation industry, such as lithium battery recovery equipment and recycled material production equipment.
Subsidy rate	1/3 or 1/2
Related URLs	Ministry of the Environment Budget Project https://www.env.go.jp/content/000181430.pdf

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Use of proceeds 11: Promotion of the construction of zero-emission ships etc.

ICMA GBP Classification	"Clean Transportation"
GB Guidelines	"Clean Transportation Projects"
Policy Intention	(B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	Of the CO_2 emissions from Japan's transportation sector, ships account for the second largest proportion after automobiles, and in order to achieve net-zero by 2050, the widespread use of zero-emission ships that use hydrogen and ammonia fuels (see below) is essential. In Japan, there are a variety of companies in the supply chain for marine business operators, including manufacturers of producing important marine equipment such as zero-emission ships etc., and the shipbuilders that construct them. By providing this support, the aim is to strengthen the international competitiveness of the shipping industry. 1) Ammonia fuel Ammonia fuel, as the name suggests, uses ammonia as a marine fuel. Ammonia fuel is expected to have a cruising range that makes it usable not only for domestic shipping but also for oceangoing shipping. Although ammonia has a relatively low risk of being flammable or explosive, it is toxic and corrosive, and care must be taken when handling it. In addition, since ammonia (NH_3) itself does not contain carbon atoms, it does not produce CO_2 when burned. Instead, it produces nitrous oxide (N_2O), which has a greenhouse effect about 300 times that of CO_2. Therefore, research and development is underway on countermeasures by combustion control and treatment equipment etc. Currently, several domestic companies have obtained Approval in Principle (AiP) for ammonia-fueled ships from Class NK, an organization that sets standards for ship hulls, outfitting, and engines, as well as rules for class registration and conducts inspections of such standards. Additionally, research and development is underway on ammonia-fueled tugboats and ammonia-fueled ammonia gas carriers. After demonstration experiments, it is expected that the tugboats will be in commercial operation as soon as possible, by 2024, and the ammonia gas carriers by 2028. 2) Hydrogen fuel Hydrogen fuel is fuel that obtains its energy by directly burning hydrogen. As for hydrogen fuel, liquefied hydrogen is stored in a tank and vaporized before being burned. The challenge is to develop the technology to properly store and burn hydrogen, an extremely light element, and research and development is currently underway toward a demonstration experiment. A domestic company is currently conducting research into engine technology that runs on a mixture of hydrogen and low-sulfur fuel oil, and has obtained AiP from Class NK for hydrogen-fueled ships. The engine is scheduled to be installed on a hydrogen carrier scheduled to enter service in the late 2020s.
Business summary	The government will support capital investment required for the development and expansion of production facilities for engines, fuel tanks, fuel supply systems, etc., which are necessary for the construction of zero-emission ships, etc., as well as the development and expansion of facilities for installing the above-mentioned marine equipment on ships.
Subsidy rate	1/3 or 1/2
Related URLs	Reference to the Sector-specific Investment Strategies (Ships) https://www.meti.go.jp/press/2023/12/20231222005/20231222005-09.pdf

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Use of proceeds 12: Support for strengthening domestic production capacity of power semiconductors contributing to energy savings

(Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP Classification	"Clean transportation" and "Renewable energy"
GB Guidelines	"Projects for clean transportation" and "Projects for renewable energy "
Policy Intention	(B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	As semiconductors play an increasingly large role in people's lives in response to digitalization and green innovation, power semiconductors (such as SiC power semiconductors; see below) that control voltage are essential as power control devices for all types of equipment, including EVs and wind power generators, in order to achieve carbon neutrality in the future, and are also extremely important in terms of economic security. It will support companies in strengthening domestic production capacity for power semiconductors and other products while leveraging the technological advantages of each company and ensuring steady investment toward the realization of GX, while strengthening the supply chain. ●About power semiconductors Power semiconductors are semiconductors used to control and supply electrical energy, for example by converting alternating current to direct current or lowering voltage. It has a wide range of applications, including in-vehicle batteries, power transmission and distribution, railway vehicles, and home appliances (air conditioner inverters), and is effective in reducing electrical loss in products and improving energy efficiency. The switching function of power semiconductors is primarily used for power conversion. The market size of power semiconductors is expected to continue to expand steadily in the future. One of the factors driving market expansion is the shift to electric vehicles. Power semiconductors are widely used for input and output of electricity for batteries, motor drives, etc. In addition, large amounts of power semiconductors are required for data centers, solar power generation, wind power generation, stationary batteries, and other areas where investment is increasing. Anticipating this demand, power semiconductor manufacturers are increasing their capital investments and accelerating their development. ●About SiC semiconductors Because power semiconductors handle large voltages and currents, "loss" caused by electricity being converted into heat inside them can be a problem. SiC semiconductors are expected to be a technology that can eliminate this loss. SiC semiconductors are a 1:1 compound of silicon (Si) and carbon, and are produced by solidifying silicon and black smoke in an electric furnace and carbonizing it. SiC, a next-generation power semiconductor material, has lower power loss than conventional silicon (Si) materials. For example, research has shown that power semiconductors using SiC materials have succeeded in reducing power loss (on-resistance) by approximately 70% in the prototype stage compared to types using conventional silicon materials.
Business summary	Pursuant to the Economic Security Promotion Act, any party seeking to ensure a stable supply of semiconductors is eligible to receive support if it prepares a plan for the measures it intends to implement to ensure a stable supply of semiconductors and other products (supply assurance plan) and submits it to the Minister of Economy, Trade and Industry and receives approval. The investment must be of a significant scale (in principle, a business scale of 200 billion yen or more) that is deemed necessary to maintain international competitiveness in the future, primarily in SiC power semiconductors. In addition, when granting certification, the efforts made toward the procurement of important parts and materials will also be taken into consideration. The performance of the facilities and equipment to be introduced is cutting-edge.
Subsidy rate	1/3
Related URLs	https://www.meti.go.jp/policy/economy/economic_security/semicon/index.html

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Use of proceeds 13: Subsidy for energy saving investments/demand structure conversion (Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP Classification	"Energy efficiency"
GB Guidelines	"Projects for energy efficiency"
Policy Intention	(B) Capital investment that contributes to both emissions reduction and economic growth
Background/ Objective	The 6th Strategic Energy Plan set a goal of reducing energy consumption by approximately 62 million kl by 2030 through energy conservation. Recognizing that it is necessary to further dig deeper into energy conservation in these two sectors, the "Technology Evaluation Committee for Advanced Energy Conservation Technologies, etc." established by the Agency for Natural Resources and Energy in FY2020 concluded that high energy conservation potential is expected. The government announced a policy to discover advanced technologies in the market and provide intensive support through subsidies and other means. The purpose of this project is to contribute to the achievement of the "Energy Supply and Demand Outlook for FY2030" by supporting efforts to achieve significant energy conservation throughout factories and workplaces through the introduction of equipment that involves mechanical design, equipment designed and manufactured according to the purpose and application of the business operator, and advanced equipment, etc., as well as equipment renewal that involves electrification and fuel conversion that will lead to decarbonization. Provide support in response to companies' multi-year investment plans and cultivate demand for energy-saving investments, especially among small and medium-sized enterprises. Furthermore, by promoting the upgrading of facilities and equipment with high energy-saving performance in factories, etc., it will both reduce greenhouse gas emissions and strengthen Japan's industrial competitiveness. As a goal, it plans to promote the implementation of measures centered on energy-saving equipment investment among the energy-saving measures (approximately 27 million kl) in the industrial and business sectors based on the energy supply and demand outlook for FY2030, and will include the effects of this budget project, aiming to achieve energy savings of 21.55 million kl.
Business summary	I. Factory/ Workplace type (A) Advanced Projects Support to the introduction of advanced equipment that can achieve significant energy savings in factories and workplaces. The target equipment, design, and construction costs for projects that meet any of the following requirements on a crude oil equivalent basis at the application unit are covered. (1) Energy conservation rate + non-fossil fuel ratio increase rate: 30% or more (2) Energy saving amount + non-fossil fuel consumption: 1,000 kl or more (3) Improvement rate of energy consumption per unit of production: 15% or more (B) Custom-made business Support to the upgrade to energy-efficient equipment and process modifications, including the introduction of custom-made equipment that requires individual design. The target equipment, design, and construction costs for projects that meet any of the following requirements on a crude oil equivalent basis at the application unit are covered. (1) Energy conservation rate + non-fossil fuel ratio increase rate: 10% or more (2) Energy saving amount + non-fossil fuel consumption: 700kl or more (3) Improvement rate of energy consumption per unit: 7% or more II. Electrification/decarbonization type Fuel conversion for the purpose of electrification and decarbonization, such as conversion from fossil fuels to electricity and conversion to lower carbon fuels. It will support the introduction of accompanying equipment, etc. [Target business] Businesses that fall under electrification and fuel conversion for the purpose of decarbonization [Supported equipment] The following equipment* which meet energy standards set by the Sustainable open Innovation

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	Initiative (SII); ・Industrial heat pump ・Of commercial water heaters, commercial heat pump water heaters ・Low carbon industrial furnace ・High efficiency cogeneration ・High performance boiler *However, equipment that uses coal and oil is not included.
Subsidy rate	I. Factory/ Workplace type (A) Advanced Projects Small and medium-sized enterprises: up to 2/3, large enterprises and others: up to 1/2 [Subsidy limit] Upper limit (energy saving) 1.5 billion yen (non-fossil conversion) 2 billion yen *3 billion yen in the case of multi-year project (4 billion yen in the case of non-fossil conversion) Lower limit: 1 million yen (B) Custom-made business Small and medium-sized enterprises: up to 1/2, large enterprises and others: up to 1/3 [Subsidy limit] Upper limit (energy saving) 1.5 billion yen (non-fossil conversion) 2 billion yen *3 billion yen in the case of multi-year project (4 billion yen in the case of non-fossil conversion) Lower limit: 1 million yen II. Electrification/decarbonization type up to 1/2 [Subsidy limit] Upper limit 300 million yen (electrification) 500 million yen Lower limit: 300,000 yen
Related URLs	https://sii.or.jp/koujou05r/overview2.html

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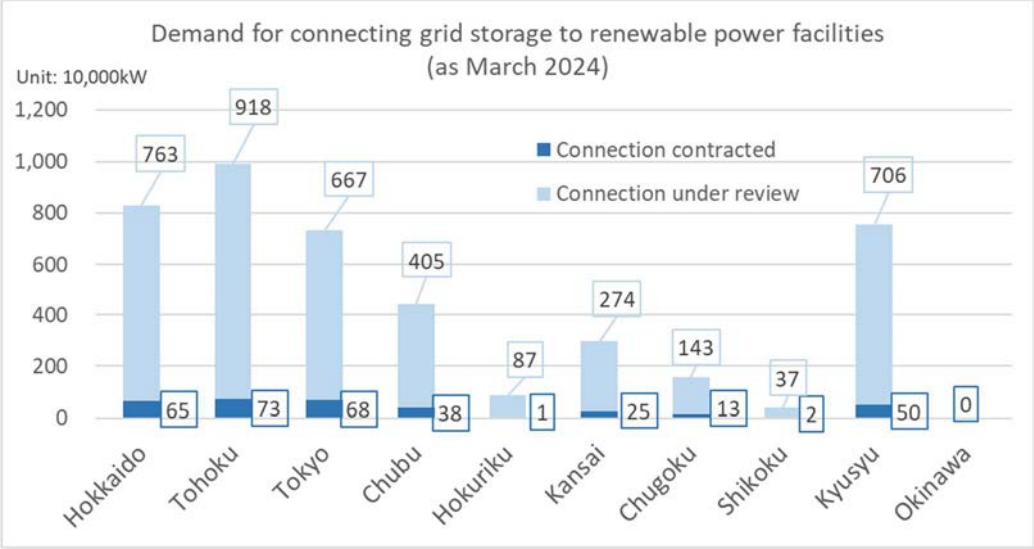
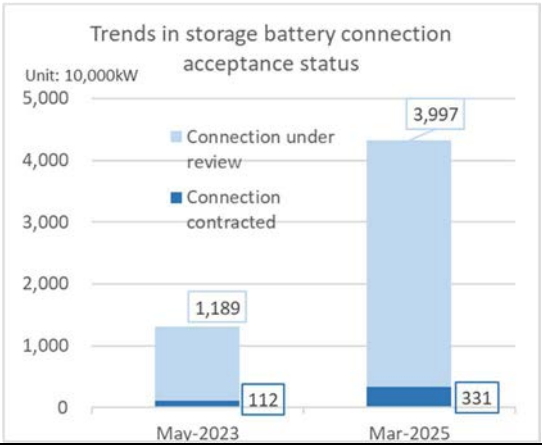
(3) Subsidy Program for introducing support

Use of proceeds 14: Installation support for electricity storage systems such as grid-scale batteries to expand renewable energy usage

ICMA GBP Classification	"Energy efficiency," "Renewable energy," and "Clean transportation."
GB Guidelines	"Projects for energy efficiency," "Projects for renewable energy," and "Projects for clean transportation "
Policy Intention	(C) Creating demand at a national level for economic growth (Subsidies)
Background/ Objective	In order to achieve net-zero by 2050, it is necessary to accelerate the introduction of renewable energy. On the other hand, the amount of electricity generated by renewable energy sources such as solar and wind power fluctuates greatly depending on the weather, time of day, etc., which can result in power surpluses at certain times of the day and lead to output controls. In addition, if their introduction becomes widespread, it could have an impact on the stability of the power grid. For this reason, it is necessary to secure decarbonized adjustment capacity that can respond to these fluctuations, and further introduction and utilization of large-scale power storage systems such as grid batteries is expected. The status of introduction of grid batteries is as follows: their introduction has expanded rapidly over the past one or two years, with contract applications for connection totaling approximately 3.30 million kW nationwide. In order to make renewable energy the main power source, it will become necessary to introduce technology that allows for even longer charging and discharging times. As a result, the market for long-term energy storage technology is expected to expand in Japan as well.  

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Business summary	The government will subsidize the introduction costs of power storage systems, such as grid batteries and electrolyzer, which will contribute to the expansion of renewable energy adoption. The purpose of this project is to secure the necessary adjustment capacity for the large-scale introduction of renewable energy by subsidizing part of the installation costs to introduce large-scale power storage systems, such as grid-connected batteries that are directly connected to the power grid.
Subsidy rate	2/3, 1/2, 1/3
Related URLs	Reference to the Sector-specific Investment Strategies (Batteries) https://www.meti.go.jp/press/2023/12/20231222005/20231222005-06.pdf

Use of proceeds 15: Regional decarbonization promotion grant

(Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP Classification	"Renewable energy"
GB Guidelines	"Projects for renewable energy "
Policy Intention	(C) Creating demand at a national level for economic growth (Subsidies)
Background/ Objective	This project aims to support the introduction of key decarbonization products and technologies with a high emission reduction effect in areas (specific areas) designated by the Ministry of the Environment as Decarbonization leading areas based on the Regional Decarbonization Roadmap[45], the Plan for Global Warming Countermeasures, and the Basic Policy for Realization of GX, where private businesses will build self-operated microgrids through public-private partnerships. A microgrid is a small-scale energy network that aims to achieve local production and consumption by having energy supply sources and consumption facilities within a community, rather than relying on electricity supply from large-scale power plants. Renewable energy sources such as solar power, wind power, and biomass power will be used as energy sources, but since the supply of renewable energy is intermittent, it is said to be difficult to match it to energy demand. To stabilize this energy, the microgrid will be managed and operated using information and communications technology. Normally, electricity is transmitted to the end consumer via a substation, and the longer the distance, the more power loss and energy usage occurs for transmission. However, by installing small-scale power generation facilities near the end consumer and supplying electricity from there, power loss can be reduced. Furthermore, even when a natural disaster occurs, if the power generation facilities in the area are not damaged, the time from disaster to recovery can be shortened by switching only to local production and consumption. In light of the above, the Regional Decarbonization Roadmap gives examples of decarbonization efforts that utilize digital technologies tailored to regional characteristics, such as the use of microgrids.
Business summary	Subsidies are available to local governments in areas (specific regions) that are Decarbonization leading areas and have built self-operated microgrids that benefit private businesses.
Subsidy rate	In principle, 2/3
Related URLs	https://policies.env.go.jp/policy/roadmap/assets/grants/chiiki-datsutanso-kofukin-R6.pdf

[45]National and Local Council for the Achievement of Decarbonization, "Regional Decarbonization Roadmap: A Transition Strategy for the Next Era Starting from Local Communities" (June 9, 2021)
https://www.cas.go.jp/jp/seisaku/datsutanso/pdf/20210609_chiiki_roadmap.pdf

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Use of proceeds 16: Subsidy for promoting energy savings in households through installing high-efficiency water heaters

ICMA GBP Classification	"Energy efficiency"
GB Guidelines	"Energy conservation projects"
Policy Intention	(C) Creating demand at a national level for economic growth (Subsidies)
Background/ Objective	Approximately 14.7% of Japan's GHG emissions come from the residential sector, with emissions from hot water supply accounting for approximately 25% of these emissions. This project aims to contribute to achieving the "Energy Supply and Demand Outlook for FY2030" by supporting the introduction of highly efficient water heaters such as heat pump water heaters and household fuel cells and expanding their use. The following high-efficiency water heaters are eligible: - Heat pump water heater: This system uses the principle of a heat pump, which transfers heat by utilizing the properties of gas - the temperature rises when it is compressed and falls when it expands - to boil water and store it in a tank. - Domestic fuel cells: Generate electricity through a chemical reaction between hydrogen made from city gas, LP gas, etc. and oxygen in the air, and also use the waste heat from the power generation process to boil water and store it in a tank. - Hybrid water heater: A system that combines a heat pump water heater and a gas water heater to produce hot water and store it in a tank. By using two heat sources, hot water can be supplied more efficiently. ●Energy consumption efficiency of high-efficiency water heaters This subsidy project sets the following performance requirements for the highly efficient water heaters that are eligible. ・ Heat pump water heater The EcoCute is a Top Runner System-eligible device that meets the 2025 target standard value (standard energy consumption efficiency) under the Energy Conservation Act. ・ Hybrid water heater The system uses both an electric heat pump and a gas auxiliary heat source as heat source equipment, and is equipped with a hot water storage tank. The annual hot water efficiency must be 108% or higher according to the standard (JGKAS A705) set by the Japan Gas and Kerosene Appliances Industry Association. ・ Domestic fuel cells The product must be registered on the list of registered devices published by the Fuel Cell Promotion Association (FCA). Please refer to the following URL (Japanese) for product requirements. FCA: http://fca-enefarm.org/registration_apply.html
Business summary	The program provides subsidies for the costs of installing high-efficiency water heaters, which are necessary for consumers to reduce energy consumption at home. It is expected that the company will support the introduction of over 400,000 units next fiscal year. <Installation of high-efficiency water heaters> (a) Heat pump water heater: 80,000 to 130,000 yen/unit (b) Hybrid water heater: 100,000 to 150,000 yen/unit (c) Home fuel cell: 180,000 to 200,000 yen/unit
Subsidy rate	As shown above, fixed price for each device/performance.
Related URLs	Reference to the Sector-specific Investment Strategies (Life-related Industry) https://www.meti.go.jp/press/2023/12/20231222005/20231222005-10.pdf

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Use of proceeds 17: Subsidy for introducing clean energy vehicles

(Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP Classification	"Clean transportation"
GB Guidelines	"Projects for clean transportation "
Policy Intention	(C) Creating demand at a national level for economic growth (Subsidies)
Background/ Objective	The transportation sector accounts for about 20% of Japan's carbon dioxide emissions. The automotive sector accounts for approximately 90% of the transportation sector, and in order to achieve net-zero by 2050, the spread of clean energy vehicles with excellent environmental performance is important. It is also important to leverage the spread of electric vehicles in the domestic market while strengthening the competitiveness of the automobile industry to capture overseas markets. The purpose is to strengthen industrial competitiveness and reduce carbon dioxide emissions by supporting the costs of introducing electric vehicles and other vehicles.
Business summary	Based on the purpose of GX support, from the perspective of promoting the creation of an environment in which electrified vehicles can be used sustainably, the amount of subsidies for each company's vehicles is determined by comprehensively evaluating not only the performance of the vehicle, but also the efforts of the automakers, such as the development of charging infrastructure, the securing of an after-sales service system, and the sustainability of the entire life cycle. － In order to encourage price reductions, for high-priced vehicles (over 8.4 million yen excluding tax), the calculated subsidy amount is multiplied by a price coefficient of 0.8. For PHEVs, which directly emit CO_2, the CBI sets a threshold of 50g-CO_2/km/vehicle/person for tank-to-wheel (drive from the fuel tank to the tires). JCR has confirmed that there are no vehicles that exceed the threshold among the eligible vehicles for which the proceeds of this Bonds will be used.
Subsidy rate	Subsidies are provided to individuals, corporations, local governments, etc. who purchase eligible vehicles, according to the following criteria. EV upper limit: 850,000 yen Light EV upper limit: 550,000 yen PHEV upper limit: 550,000 yen FCV upper limit:: 2.55 million yen
Related URLs	https://www.meti.go.jp/policy/mono_info_service/mono/automobile/cev/r5hosei_cev.html

Use of proceeds 18: Accelerating energy/emissions savings of housing through promoting renovations for insulated windows

(Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP Classification	"Energy efficiency"
GB Guidelines	"Projects for energy efficiency"
Policy Intention	(C) Creating demand at a national level for economic growth (Subsidies)
Background/ Objective	The Plan for Global Warming Countermeasures sets a goal of reducing GHG emissions from the residential sector by 66% by FY2030 compared to FY2013, but approximately 80% of existing houses do not meet current energy conservation standards, making energy conservation measures for houses an urgent priority. In particular, energy efficiency retrofit that reduce the transfer of heat between inside and outside the house directly lead to improved operating efficiency of heating and cooling systems, which account for a large source of CO_2 emissions in the residential sector, and greatly contribute to reducing energy consumption. By improving the insulation performance of windows of existing houses, which are a major source of heat loss (about 70% of the total heat loss of houses comes through windows), the burden of heating and cooling costs can be reduced, and lead to CO_2 emissions reductions. The goal is to reduce total CO_2 emissions from residential sector by approximately 70% (compared to FY2013) and lead to ensure energy-saving performance at the level of the ZEH standard*1 as the average for all of the existing houses in 2050.

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*1 Definition of ZEH
ZEH is a system that "significantly improves the insulation performance of the exterior envelope, maintains the quality of the indoor environment through the introduction of highly efficient equipment systems, achieves significant energy savings, and then introduces renewable energy, etc." This refers to housing that aims for zero annual primary energy consumption and meets the following four conditions.
(i) ZEH reinforced exterior standard (*2016 Energy Conservation Standards 1-8 Regions (attention must be paid to ensuring η_{AC} value, airtightness, and moisture-proofing performance, etc.)) and U_A value [W/m^{2}K] 1.2 Region: 0.40, 3 Region: 0.50 or less, 4-7 Region: 0.60 or less)
(ii) Reduce primary energy consumption, excluding renewable energy, by more than 20% from the standard primary energy consumption.
(iii) Introduction of renewable energy (regardless of capacity)
(iv) Reduce primary energy consumption by 100% or more from standard primary energy consumption through the addition of renewable energy sources, etc.

* ZEH reinforced exterior standard

	Area 1 (Asahikawa City)	Area 2 (Sapporo City)	Area 3 (Morioka City)	Area 4 (Sendai City)	Area 5 (Niigata City)	Area 6 (Tokyo)	Area 7 (Miyazaki City)
Average heat transfer coefficient of the outer skin	0.4	0,4	0.5	0.6	0.6	0.6	0.6
Heat transfer limits of windows	1.9	1.9	1.9	2.33	2.33	2.33	2.33

Business summary	Renovation of insulated windows in existing houses ・Subsidy amount: Fixed amount according to the performance of the windows, etc. ・Target: Window (glass/sash) retrofit (Windows should meet certain standards, such as having a thermal transmission coefficient (Uw value) of 1.9 or less, which exceeding satisfies the target standard value of the Top Runner System for Building Materials 2030.*2
Subsidy rate	Individuals will receive approximately half the amount (up to 2 million yen)
Related URLs	https://www.env.go.jp/earth/earth/ondanka/building_insulation/window_00002.html

*2 Insulation repair standards

	Glass	Inner window	Outside window (Cover type)	Outside window (Chisel method)
Detached houses and low-rise apartment buildings	Uw1.9 or less	Uw1.9 or less	Uw1.9 or less	Uw1.9 or less
Mid-to-high rise apartments	Uw1.9 or less	Uw1.9 or less	Uw2.3 or less	Uw1.9 or less

Use of proceeds 19: Accelerating decarbonizing renovations for commercial buildings

ICMA GBP Classification	"Energy efficiency"
GB Guidelines	"Projects for energy efficiency"
Policy Intention	(C) Creating demand at a national level for economic growth (Subsidies)

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Background/ Objective	In the buildings sector, it is essential to take measures for existing buildings that have a large potential for CO_2 reduction to achieve 2050 goal, which is to ensure the energy efficient performance at the level of ZEB standard as the average for all of the existing buildings in 2050. By supporting the acceleration of the introduction of high-insulation exterior and high-efficiency air conditioning equipment, the goal is to achieve both strengthening industrial competitiveness and economic growth by reducing prices of the products, and reducing greenhouse gas emissions from buildings, such as commercial and educational facilities, as well as improving the quality of life, including health and comfort.
Business summary	(1) Support for accelerating decarbonization renovation of commercial buildings Subsidies for equipment to promote high insulation of the exterior envelope of existing buildings and the introduction of high-efficiency air conditioning equipment, etc. Main requirement: Envelope performance after renovation is BPI 1.0 or less. And primary energy consumption is reduced by 30% or 40% or more depending on the use from the energy conservation standard (hotels, hospitals, department stores, restaurants, etc.: 30%, offices, schools, etc.: 40%) Main target equipment: insulated windows, insulation materials, high-efficiency air conditioning equipment, high-efficiency lighting (equipment that meets certain standards, such as exceeding the Top Runner System target value). (2) Cost of outsourcing support services such as data management and analysis related to support for accelerating decarbonization renovation of commercial buildings.
Subsidy rate	Depending on the renovation content, a fixed amount or a subsidy rate of 1/2 to 1/3
Related URLs	https://bl-renos.jp

Use of proceeds 20: Promotion of electrifying commercial vehicles

(Continued projects from the first series of Japanese Climate Transition Bonds (issued in FY2023))

ICMA GBP Classification	"Clean Transportation"
GB Guidelines	"Projects for clean transportation"
Policy Intention	(C) Creating demand at a national level for economic growth (Subsidies)
Background/ Objective	The transportation sector accounts for approximately 20% of Japan's total CO_2 emissions, of which approximately 40% comes from commercial vehicles such as trucks. In order to achieve net-zero by 2050 and the GHG reduction target for FY2030 (a 46% reduction compared to FY2013), the electrification of commercial vehicles (BEVs, PHEVs, FCVs, etc.) is essential. To this end, this project will provide subsidies for the electrification of commercial vehicles (trucks, taxis, and buses) and support the acceleration of their adoption in the early stages of widespread use, thereby achieving both enhanced industrial competitiveness and economic growth through lower prices, as well as reduced GHG emissions. This project will provide subsidies for the introduction of vehicles and charging equipment for the electrification of commercial vehicles (trucks, taxis, buses) (BEVs, PHEVs, FCVs, etc.), thereby attracting domestic investment over the next 10 years and achieving the 2030 targets for commercial vehicles of 8 tons or less: a 20-30% ratio of electric vehicles in new car sales, and for vehicles over 8 tons: an advance introduction of a cumulative 5,000 electric vehicles. Combined with separate support for the introduction of passenger cars, this will promote decarbonization of the entire transportation sector. Additionally, price competitiveness will be improved by reducing vehicle prices and accelerating innovation.
Business summary	Subsidies will be provided to the following businesses that have plans to introduce non-fossil energy vehicles for the introduction of vehicles (BEVs, PHEVs, FCVs, etc.) and charging equipment for electrifying commercial vehicles (trucks, taxis, buses). *Businesses eligible for subsidies [Trucks] (i) Freight truck transportation business operators

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	(ii) Persons who use private commercial vehicles (trucks, etc.) for business purposes (limited to vehicles with a gross vehicle weight of over 2.5 tons) (iii) Persons whose business is to rent commercial vehicles (trucks, etc.) (limited to those who rent commercial vehicles to (i), (ii), and (iv).) (iv) Local government (v) Any other person deemed appropriate by the executive body with the approval of the Minister of the Environment. [Taxis and Buses] (i) Persons who uses vehicles such as taxis for business purposes (ii) Persons whose business is leasing vehicles such as taxis. (Limited to those who lend to (i), (iii), and (vii).) (iii) Educational corporations or companies that lend taxis, etc., or bus vehicles that they own or use to specified passenger motor vehicle transportation business operators, and entrust them with passenger transportation. (iv) Persons who lend his or her own taxi, etc. or bus vehicle to a passenger vehicle transportation business that is a subsidiary company established by the company with an investment ratio of more than 50%, such as by spinning off a passenger vehicle transportation business. (v) Persons who use bus vehicles for business purposes (vi) Persons whose business is leasing bus vehicles (limited to those leasing to (v) and (vii)) (vii) Local government (viii) Any other person deemed appropriate by the subsidy body with the approval of the Minister of the Environment. For PHEVs, which directly emit CO_2, the CBI sets a threshold of 50g-CO_2/km/vehicle/person for tank-to-wheel (drive from the fuel tank to the tires). JCR has confirmed that there are no vehicles that exceed the threshold among the eligible vehicles for which the proceeds of this Bonds will be used.
Subsidy rate	[Trucks] EV trucks/van, FCV trucks Subsidy rate: 2/3 of the difference with standard fuel efficiency vehicles, etc. [Taxis] EV taxi/FCV taxi/PHEV taxi Subsidy rate: 1/4 of the vehicle price, etc. [Buses] EV bus/FCV bus subsidy rate: 2/3 of the difference with standard fuel efficiency vehicles, etc. [Charging equipment] Subsidy rate: 1/2 etc. *In principle, this is limited to those introduced together with the above vehicles.
Related URLs	(Trucks) https://www.levo.or.jp/subsidy/hoseiyosan/ (Taxis and buses) https://www.ataj.or.jp/index_taxibus.html

Use of proceeds 21: Support focused on the price gap to build supply chains for hydrogen and its derivatives

ICMA GBP Classification	"Circular economy adapted products, production technologies and processes"
GB Guidelines	"Projects concerning production technologies and processes and environmentally friendly products for the circular economy"
Policy Intention	(D) Cross-cutting efforts to realize GX
Background/ Objective	Hydrogen is expected to be utilized in hard-to-abate sectors such as steel and chemicals, where there are few alternative technologies and transition is difficult, as well as in the mobility field and power generation. Japan's Basic Hydrogen Strategy, revised in June 2023, outlines the following four points: (i)In addition to the 2030 target of 3 million tons of hydrogen, etc., the target is set at 12 million tons for 2040 and around 20 million tons for 2050 (cost targets will be reduced from the current 100 yen/Nm^3 to 30 yen/Nm^3 in 2030 and 20 yen/Nm^3 in 2050). (ii) A target for the introduction of electroryzer by Japanese-related companies both domestically and overseas is set at around 15 GW by 2030. (iii) A support system will be established for building supply chains and developing supply infrastructure. (iv) The G7 has agreed on carbon intensity, aiming to transition to low-carbon hydrogen, etc.

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	The target costs for 2030 and 2050 under (i) are set at levels that are fully competitive with fossil fuels. The purpose of this project is to promote the social implementation of hydrogen by providing price differential support to reduce the cost of hydrogen supply to the same level as existing raw fuels. In addition, in May 2024, in order to promote the supply and use of low-carbon hydrogen at an early stage, and for the government to will take the lead in formulating a basic policy, by establishing a plan certification system, and taking special measures to support businesses that have received plan approval (such as "support focusing on price gaps" and "support for base development") and regulations, the Diet passed the . The Act on Promotion of the Supply and Utilization of Low-Carbon Hydrogen and its Derivatives for Smooth Transition to a Decarbonized, Growth-Oriented Economic Structure (Hydrogen Society Promotion Act) was enacted, stipulating The Act also stipulates that businesses supplying hydrogen and other products should take measures such as formulating judgment criteria to be addressed.
Business summary	This project will support all or part of the difference between the "reference price calculated from the cost required for the production and supply of low-carbon hydrogen" and the "reference price that takes into account environmental value and other factors in addition to the existing raw material and fuel price to be substituted." The Sector-specific Investment Strategies have been proposed with the following three points as its core requirements, but the details are yet to be considered. 1) Energy policy (S+3E) perspective The business must satisfy all of the S+3E criteria, namely, it must be a business that contributes to stable supply (use), is low-cost, contributes to decarbonization, and utilizes decarbonized resources in an economically rational and efficient manner, with safety as the fundamental premise. 2) Perspective on realizing GX •The GX policy is based on the "Basic Principles of Investment Promotion Measures Using Japan Climate Transition Bonds," and prioritizes projects that "contribute to the realization of strengthening industrial competitiveness, economic growth, and emission reductions" while "taking into consideration factors such as the need for domestic supply, which is essential to achieving GX, and will support projects with the highest priority." •Taking this into consideration, the government requires the following three items to be included in business plans seeking support that focuses on price gaps. (1) In areas and applications where there are few alternative technologies, such as steel and chemicals, and where transition is difficult, it will also lead the way in raw material and fuel conversion, involving new capital investment and business innovation. (2) As a result of (1), it is deemed that the project will contribute significantly to strengthening the international competitiveness of industries related to the supply and utilization of low-carbon hydrogen, etc. (3) Based on a concept consistent with international accounting rules, it is expected to contribute to reducing domestic emissions and keep carbon intensity below a certain level. * In order to confirm (1), a unified business plan must be prepared jointly by both the supplier and the user seeking support. 3) Building a self-reliant pilot supply chain •For support focusing on price differentials, projects that are expected to start supply by fiscal year 2030 should be selected, provided that they are pioneering and expected to be self-reliant, leading to the establishment of subsequent supply chains thereafter. •Therefore, in order to ensure economic independence, it is requested that supply be continued for a certain period (10 years) after the 15-year support period ends. •In addition, in order to appropriately return the knowledge gained from support focusing on price gaps, the applicant shall also confirm whether there are plans to utilize the know-how of the supported businesses to implement new related businesses both domestically and overseas in order to develop new industries and new markets.
Related URLs	https://www.meti.go.jp/press/2023/12/20231222005/20231222005-13.pdf

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(4) Capital investment in the GX Acceleration Agency

Use of proceeds 22: Capital investment in the Agency for Promoting the Transition to a Carbon-Free Economy (GX Acceleration Agency)

ICMA GBP Classification	"Renewable energy", "Energy efficiency", "Clean transportation", "Low carbon/decarbonized energy," "Circular economy adapted products, production technologies and processes and/or certified eco-efficient products", "Environmentally sustainable management of living natural resources and land use".
GB Guidelines	"Projects for renewable energy," "Projects for energy efficiency," "Projects for clean transportation," "Projects concerning production technologies and processes and environmentally friendly products for the circular economy," and " Projects for the sustainable management of living natural resources and land use."
Policy Intention	(D) Cross-cutting efforts to realize GX
Background/ Objective	As mentioned above, as the investment race to realize GX accelerates on a global scale, Japan will need to invest more than 150 trillion yen in GX from both the public and private sectors over the next 10 years in order to simultaneously achieve international commitments such as net-zero by 2050 while strengthening industrial competitiveness and achieving economic growth. The GX Promotion Act was enacted based on the "Basic Policies for Realizing GX" compiled by the GX Implementation Council in December 2023. The law codifies (1) the formulation and implementation of a GX promotion strategy, (2) the issuance of GX economy transition bonds, (3)the introduction of growth-oriented carbon pricing, (4) the establishment of a GX Acceleration Agency, and (5) progress evaluation and necessary review. In line with this, the purpose of this initiative is to raise capital to establish the GX Acceleration Agency. The GX Acceleration Agency is defined in the Strategy for Promoting the Transition to a Carbon-Decarbonized Growth-Oriented Economic Structure (GX Promotion Strategy) as an agency that carries out operations related to the operation of the emissions trading system and the collection of charges and levies (including part of the support for upfront investment).
Business summary	The agency is scheduled to begin operations on July 1, 2024. The details of the work disclosed at the time of evaluation are as follows: Initially established: Financial support business (debt guarantees, etc.) 2026~ Add CP related business 2028~ Collecting the GX-surcharge on fossil fuel supply 2033~ Allowance auctioning will be held, and specific business contributions will be collected. *To promote GX, corporate collaboration efforts and research and development will also be implemented. This Bonds will be primarily used for financial support operations (debt guarantees, etc.) that are scheduled to begin immediately after the company's establishment. The basis of this financial support business is to identify risks that private financial institutions cannot truly address when implementing new GX technologies in society, when there are technical, completion, and demand risks and a high level of uncertainty, and to compensate for those risks. In addition, risk compensation will be provided, taking into account that the funding source will be GX Economy Transition Bonds, which can be used in the same way as budgetary measures. The following five points have been proposed as standards that the Agency should follow when providing financial support. (1) Activities that are aligned with government policies such as the GX Promotion Strategy and the Japan Climate Transition Bond Framework (2) Social implementation of new technologies or businesses utilizing them (3) There are risks that cannot be fully addressed by private financial institutions, etc., and these risks need to be supplemented. (4) Sustainability of the recipients of support, contribution to GX policy, stimulating private financing, contributing to the development of new financing methods, and creating quality jobs (5) Build and commit to a system to efficiently, effectively and reliably implement support projects

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	(Source: The 11th GX Implementation Council materials)
Related URLs	https://www.meti.go.jp/press/2023/12/20231222005/20231222005-13.pdf https://www.cas.go.jp/jp/seisaku/gx_jikkou_kaigi/dai11/siryou1.pdf

2. Negative Impacts on the Environment

Among the uses of funds covered by this Bonds, for research and development funds, it will check for potential negative impacts on the environment and society during the project selection and evaluation process at the time of review when contributing to each R&D expense. It will also confirm mitigation measures as necessary. In addition, when implementing subsidy programs, individual business operators identify negative impacts on the environment and society based on laws and regulations such as environmental impact assessment, and ensure that necessary mitigation measures are taken.

As stated in Chapter 2 of this report, avoidance of lock-in to fossil fuels, consideration for a fair transition, and consideration of DNSH will be appropriately considered, and additional measures and mitigation measures will be considered as necessary.

In consideration of the impact on the environment and society, the Japan Climate Transition Bond Framework has established the following exclusion criteria. JCR has confirmed that the use of proceeds from this Bonds does not fall under these exclusion criteria.

- Businesses aimed at manufacturing, selling, or distributing weapons of mass destruction such as nuclear weapons, chemical weapons, or biological weapons, or inhumane weapons such as anti-personnel landmines; Businesses that manufacture products and provide services that support the manufacture or sale of non-human weapons
- Businesses related to coal mining, refining, and transportation
- Business related to owning or operating gambling facilities/businesses
- Businesses related to forced labor that do not comply with the laws and regulations of the country where the business is located and involve inappropriate relationships such as bribery, corruption, extortion, embezzlement, etc.
- Businesses related to transactions that may cause social issues such as human rights and the environment

Based on the above, JCR evaluates that the negative impact on the environment and society has been taken into account and appropriate measures have been taken regarding the use of the proceeds of this Bonds.

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3. Consistency with SDGs

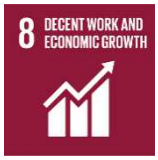
JCR evaluated the use of proceeds contributes to the following SDGs' goals and targets in reference to ICMA's SDGs mapping.

Goal 7: Affordable and clean energy

Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix

Target 7.3: By 2030, double the global rate of improvement in energy efficiency

Goal 8: Decent work and economic growth



Target 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

Target 8.4: Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead

Goal 9: Industry, innovation and infrastructure

Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

Target 9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

Target 9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

Target 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

Goal 11: Sustainable cities and communities

Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

Goal 12: Responsible consumption and production

Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

Goal 13: Climate action

Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

Goal 15: Life on land

Target 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

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Goal 17: Partnerships for the goals

Target 17.17: Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

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Evaluation Phase 2: Management, Operation and Transparency Evaluation

m1

I. Selection Criteria and Processes of the Use of Proceeds

JCR's Key Consideration in This Factor

In this section, JCR will confirm the objectives to be achieved through this evaluation target, the adequacy of the green project selection criteria and processes, and whether a series of processes will be appropriately disclosed to investors.

▶▶▶ Current Status of Evaluation Targets and JCR Evaluation

An organization was established with cross-ministerial expertise for the goals, green project selection criteria and processes in this Bonds and the GX Implementation Council, chaired by the Prime Minister under the leadership of the Cabinet Office is appropriately involved, and all disclosures were made about these conference bodies and their operations; therefore, JCR has evaluated that the transparency is also ensured.

1. Goal

Basic Policy for the Realization of GX[46]

The main plans and laws and regulations to achieve net-zero by 2050 and a 46 per cent reduction in GHG emissions in FY2030 (from FY2013) are as follows:

- Plan for Global Warming Countermeasures
- The 6th Strategic Energy Plan
- Basic Policy for the Realization of GX (GX Implementation Council)
- Act for Promoting a Smooth Transition to a Decarbonized Growth-Oriented Industrial Structure (GX Promotion Act)
- Act for Partial Revision of the Electricity Business Act and Other Acts for Establishing Electricity Supply Systems for Realizing a Decarbonized Society (GX Decarbonization Electricity Act)
- Strategy for Promoting Transition to a Decarbonized, Growth-Oriented Economic Structure (GX Promotion Strategy, included Sector-specific Investment Strategies (roadmaps))

It is important for the Government of Japan to reduce CO_2 emissions from energy sources, which account for roughly 90 per cent of GHG reductions. The Government of Japan discussed its specific reduction efforts in the GX Implementation Council, and the GX Promotion Act was enacted. The issuance of Japan Climate Transition Bonds, including this Bonds, is a measure stipulated in Article 7 of the GX Promotion Act, and is clearly positioned as part of the Government of Japan's policy toward the realization of decarbonized society.

[46]Created by JCR from the basic policy for the realization of GX

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2. Selection Criteria

In the framework evaluation published in the evaluation report on November 7, 2023, JCR confirmed that the selection criteria set by the Government of Japan in the Japan Climate Transition Bond Framework are consistent with the content stipulated in the GX Promotion Strategy. The project is evaluated as being appropriate and has an environmental improvement effect.

The use of proceeds set out in this Bonds was included in the Sector-specific Investment Strategies (roadmaps) however, the individual eligibility criteria (environmental benefits) will be examined in the working group with experts invited hereafter. JCR has evaluated that the project selection criteria are appropriate.

3. Process

In selecting projects for which the proceeds of this Bonds, the alignment is to be confirmed in the liaison meeting with relevant ministries and agencies; therefore, JCR has evaluated that the process is appropriate.

The Government of Japan's goals, selection criteria and processes for this Bonds are disclosed in the Japan Climate Transition Framework and this evaluation report. The Government of Japan plans to disclose the target projects on its website when issuing this Bonds based on the Japan Climate Transition Framework. Therefore, JCR has evaluated that transparency to investors is ensured.

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II. Management of proceeds

JCR's Key Consideration in This Factor

It is usually assumed that the method of managing the proceeds financed widely varies depending upon the finance raisers. JCR will confirm that the proceeds financed based on this evaluation target are surely allocated to green projects, and that mechanisms and internal systems are in place so that the allocation can be easily tracked and managed.

JCR will emphasize whether the proceeds financed by this evaluation target are scheduled to be early used for green projects and it will also give importance to the evaluation of the management/operation methods of unallocated proceeds.

▶▶▶ Current Status of Evaluation Targets and JCR's Evaluation

JCR has evaluated that the Government of Japan's proceeds management system has been properly established and is highly transparent since the method of managing the proceeds financed will be disclosed in this evaluation report and the framework has been already disclosed on its website.

The proceeds financed by this Bonds will be entered into the energy supply and demand account of the special account for energy measures immediately after the issuance of the bonds, and will be executed from the Special Account for Energy Measures in accordance with the adoption of the R&D project and the finalization of the subsidy project. All management of the fund allocation status is carried out in the accounting system dedicated to GX Economy Transition bonds, and the execution status is carried out in the Cabinet GX Office established in the Cabinet Office.

The plan for proceeds allocation is, in principle, subject to projects whose operations will begin in and after the fiscal period concerned or proceeds was already allocated and all proceeds will be allocated in the fiscal period in question and in cases where unallocated proceeds are generated, they shall be managed in cash. Accordingly, JCR has evaluated the plan as adequate.

The management of proceeds will be inspected by the Audit Office, an independent body, in the same way as the normal budget process. The decision on the use of proceeds and the allocation will be confirmed in the liaison meeting with relevant ministries and agencies. The ledger on the management of proceeds financed will be retained until the repayment of the target Bonds and the retention period based on laws and regulations.

Consequently, JCR has evaluated that the Government of Japan's proceeds management system has been properly established, and that the management method of the proceeds financed will be disclosed in this evaluation report; therefore, it is highly transparent.

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III. Reporting

JCR's Key Consideration in This Factor

JCR will evaluate whether the disclosure system to investors before and after financing based on this evaluation target is planned in a detailed and effective manner in this section.

▶▶▶ Current Status of Evaluation Targets and JCR Evaluation

JCR has evaluated that the Government of Japan's reporting will be appropriately disclosed for both the allocation of proceeds and the environmental benefits to investors.

Reporting on the allocation of proceeds

The Government of Japan will annually disclose the contents set out in Japan Climate Transition Framework regarding the allocation of proceeds financed by Japan Climate Transition Bonds on its website. In cases where any significant change is made in the financial situation after the full amount of the proceeds financed were allocated, the disclosure shall be made in a timely manner.

Reporting on environmental benefits

The Government of Japan plans to annually disclose the contents set forth in Japan Climate Transition Framework on its website as reporting on the environmental benefits of eligible projects. These disclosure items will quantity the progress and the expected CO_2 reduction effects for R & D and the environmental benefits, such as the expected CO_2 reduction effects by implementing the subsidy program for the program in refining the Sector-specific Investment Strategies and the disclosure will be made within the realm of possibility. The progress and environmental benefits for impact reporting will be updated at least until the end of the individual projects, and the information will be disclosed on the website for the repayment period.

Accordingly, JCR has evaluated that the reporting system by the Government of Japan is adequate.

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IV. Efforts to Address Organizational Environmental Issues

JCR's Key Consideration in This Factor

JCR will evaluate whether the top finance raiser positions environmental issues as important issues with high management priority, or whether policies/processes/criteria for selecting eligible projects are clearly positioned by establishing divisions that specialize in environmental sectors or collaborating with external organizations in this section.

▶▶▶ Current Status of Evaluation Targets and JCR Evaluation

JCR has confirmed that the Government of Japan has positioned the realization of decarbonized society as one of Japan's important issues and has stipulated laws and regulations for the decarbonization of GX and energy sources, and is working on it as an important priority issue for the government. JCR has evaluated in practical that a liaison meeting with relevant ministries and agencies has been established under the initiative of the GX Implementation Council, headed by the Prime Minister, and the government as a whole is working on it, and the GX Implementation Council and the working group responsible for the concrete examination of Sector-specific Investment Strategies has invited experts from academic, financial and industrial sectors to build a system for repeated multifaceted examinations.

Please refer to Chapter 2 2.1 and 2.2 in this evaluation report for details on the current status of this evaluation target.

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Evaluation Phase 3: Evaluation Result (Conclusion)

Green 1(T)

JCR assigned "gt1" to the preliminary appraisal of "Greenness/Transition Evaluation (Use of Proceeds,)" "m1" to the preliminary appraisal of "Management, Operation and Transparency Evaluation" based on JCR Green Finance Evaluation Methodology. As a result, JCR assigned "Green 1(T)" to the "JCR Preliminary Climate Transition Bond Evaluation" for this Bonds. This Bonds meet the criteria for the items required in the Green Bond Principles, the Green Bond Guidelines, the Climate Transition Finance Handbook, and the Basic Guidelines on Climate Transition Finance.

		Management/operation/transparency evaluation				
		m1	m2	m3	m4	m5
Greenness/ Transition Evaluation	gt1	**Green 1(T)**	Green 2(T)	Green 3(T)	Green 4(T)	Green 5(T)
	gt2	Green 2(T)	Green 2(T)	Green 3(T)	Green 4(T)	Green 5(T)
	gt3	Green 3(T)	Green 3(T)	Green 4(T)	Green 5(T)	N/A
	gt4	Green 4(T)	Green 4(T)	Green 5(T)	N/A	N/A
	gt5	Green 5(T)	Green 5(T)	N/A	N/A	N/A

Responsible Analyst: Atsuko Kajiwara, Kosuke Kajiwara, Tomohiko Inamura, Takuto Toda, Haruna Goto

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Important Explanation on this Evaluation

1. Assumptions, Significance, and Limitations of JCR Climate Transition Finance Evaluation

   JCR Climate Transition Finance Evaluation provided by Japan Credit Rating Agency (hereinafter referred to as "JCR") covers the policies set out in the JCR Climate Transition Finance Evaluation as an evaluation target and states JCR's comprehensive opinion on the extent to which allocation is made to the Green/Transition Project defined by JCR and on the degree to which the efforts to ensure the management, operation and transparency on the use of proceeds at present. It is therefore not intended to evaluate the specific environmental benefits and the management/operation system/transparency on the use of proceeds, such as individual bonds or borrowings implemented based on the policies. JCR, in principle, does not directly measure the environmental benefits of proceeds financed through the green/transition finance although JCR confirms that the environmental benefits are quantitatively and qualitatively measured by an issuer or borrower (hereinafter the issuer and borrower are collectively referred to as a "finance raiser") or the third parties requested by the finance raiser.

2. Methodology Used in this Evaluation

   The methodology used to make this evaluation is posted as JCR Green Finance Evaluation Methodology in the Sustainable Finance/ESG section on the JCR's website at https://www.jcr.co.jp/

3. Relation with Conduct for Credit Rating Business

   The conduct of assigning and providing JCR Green Finance evaluation is performed by JCR as its related business and is different from the conduct for the credit rating business.

4. Relation with Credit Rating

   This evaluation is different from a credit rating and does not commit to providing a predetermined credit rating or make available for inspection.

5. Impartiality when Evaluating JCR Green Finance

   There are no capital or personnel relationships that could create a conflict of interest between this evaluation target and JCR.

Points to Consider

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Terminology

JCR Climate Transition Finance Evaluation: The assessment of the extent to which proceeds financed by the Climate Transition Finance are allocated to green/transition finance defined by JCR and the degree of management, operation and transparency related to the use of proceeds for the green/transition finance. The evaluation is made on a scale of five in the order from top to bottom with evaluation symbols, Green 1 (T), Green 2 (T), Green 3 (T), Green 4 (T), Green 5 (T)

Status of Registration as External Evaluator of Sustainability Finance

- Ministry of the Environment: Registered as External Reviewer of Green Finance
- ICMA (observer registration as an external evaluator with the International Capital Market Association)
- UNEP FI Positive Impact Financial Principles Working Group Member
- Climate Bonds Initiative Approved Verifier

Other Registration Status as Credit Rating Agency

- Credit Rating Agency: the Commissioner of the Financial Services Agency (Credit Rating) No. 1
- EU Certified Credit Rating Agency
- NRSRO: JCR registered with the following four of the five credit rating classes of the Nationally Recognized Statistical Rating Organization ("NRSRO") as defined by the U.S. Securities and Exchange Commission: (1) financial institutions, broker/dealers, (2) insurance companies, (3) general business corporations and (4) national/ local governments. In cases where disclosure is required based on Rule 17g-7(a) of the Securities Exchange Act, such disclosure is attached to News Release on the JCR webpage at https://www.jcr.co.jp/en/.

For inquiries, please contact us below

TEL: 03-3544-7013 FAX: 03-3544-7026
Information Service Department

Japan Credit Rating Agency, Ltd.
Jiji Press Building, 5-15-8 Ginza, Chuo-ku, Tokyo 104-0061, Japan
Tel. +81 3 3544 7013, Fax. +81 3 3544 7026

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