

Japan's Green Transformation Policy and Transition Finance

April 18, 2024

1. Global Trend of Green Transformation and Japan's Response

2. Transition Finance

3. Climate Transition Bond

The global trend: Aiming for Net Zero

- After the inauguration of the President Biden, several key economies including Japan announced that they aim for Net Zero by 2050/the middle of the century.
- To pursue net zero, key economies have announced their **ambitious economic policies to pursue emission reduction, economic growth and energy/economic security simultaneously** (=Green Transformation, GX).

Number of countries with Net Zero Goal with timeframe

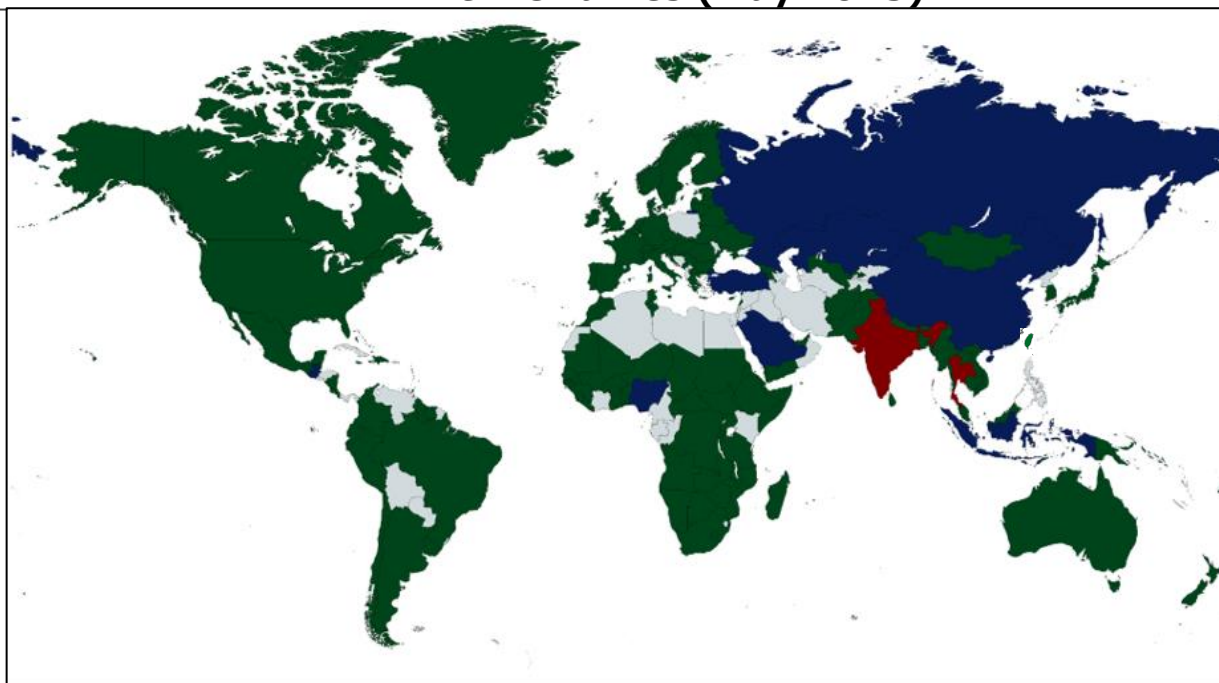
COP25
(2019)

- 121
(26% of global GDP)

May 2023

- **158**
(94% of global GDP)

Countries with Net Zero Goal with timeframes (May 2023)



Green Transformation Policies of Key Economies

- EU aims for achieving **1 trillion euros of investment in the next 10 years**.
- US Inflation Reduction Act (August 2022) provides **369 billion dollars of government support** over the next 10 years.
- **Success in GX policy implementation may define the future national competitiveness**

GX Policies by key countries

| Area | Goals/Measures | Reduction Target | GDP |
|----------------------------|--|---|-----------------|
| EU 2020.1.14 | 1 Trillion Euros of public and private investments in 10 years | ▲55% in 2030 (base year: 1990) | \$17.9 Trillion |
| US 2022.8.16 | 369 Billion Dollars of government support in 10 year (Inflation Reduction Act) | ▲50-52% in 2030 (base year: 2005) | \$23.0 Trillion |
| Germany 2020.6.3 | 50 Billion Euros of government support mainly in 2 years | ▲55% in 2030 (base year: 1990) ※EU-wide goal | \$4.2 Trillion |
| France 2020.9.3 | 30 Billion Euros of government support in 2 years | ▲55% in 2030 (base year: 1990) ※EU-wide goal | \$2.9 Trillion |
| UK 2021.10.19 | 26 Billion Pounds of government support in 8 years | ▲68% in 2030 (base year: 1990) | \$3.2 Trillion |

(Ref) Disclosures by each government, exchange rate as of October 2022

Development of Japan's Energy-Climate Policy Packages

Basic Policy for Realizing GX, Feb. 2023

GX Promotion Strategy, Jun. 2023

- Presents strategy to transform Japan from a fossil fuel-based economy to a clean energy-based economy, while ensuring energy security and achieving economic growth simultaneously
- ¥150 trillion+ of public / private investments over next decade
- **Investment promotion for GX financed by ¥20 trillion government bond**
- **Pro Growth Carbon Pricing Concept.**

46% emissions reduction
2030

Strategic Energy Plan, Oct. 2021

- Presents Japan's energy/electricity mix in 2030 consistent with new NDC

✓ **In April 2021** at the Climate Leaders' Summit, PM Suga announced, "Japan will aim for reducing its greenhouse gas emissions by 46% in FY2030 compared to FY2013." which became the revised NDC.

Green Growth Strategy, Dec. 2020

- Focuses on 14 priority areas critical for green growth
- Established ¥2trillion (¥2.6trillion now) Green Innovation Fund
- Achieving carbon neutrality through innovation

✓ **In October 2020**, PM Suga announced, "Japan will aim to achieve carbon neutrality and a decarbonized society by 2050."



Carbon Neutrality
2050

2030

2050

GX Promotion Strategy – Japan’s Challenge

- Based on the **GX Promotion Act** (enacted May 2023), the Japanese government adopted the **“GX Promotion Strategy” in July 2023**. The **strategy sets forth necessary policies to be implemented to achieve 150 trillion yen of public and private investments** to realize GX (green transformation), a transition from a fossil fuel-oriented economic and industrial structure since the Industrial Revolution to a clean energy-oriented one.

1. Green Transformation based on the Steady Supply of Energy

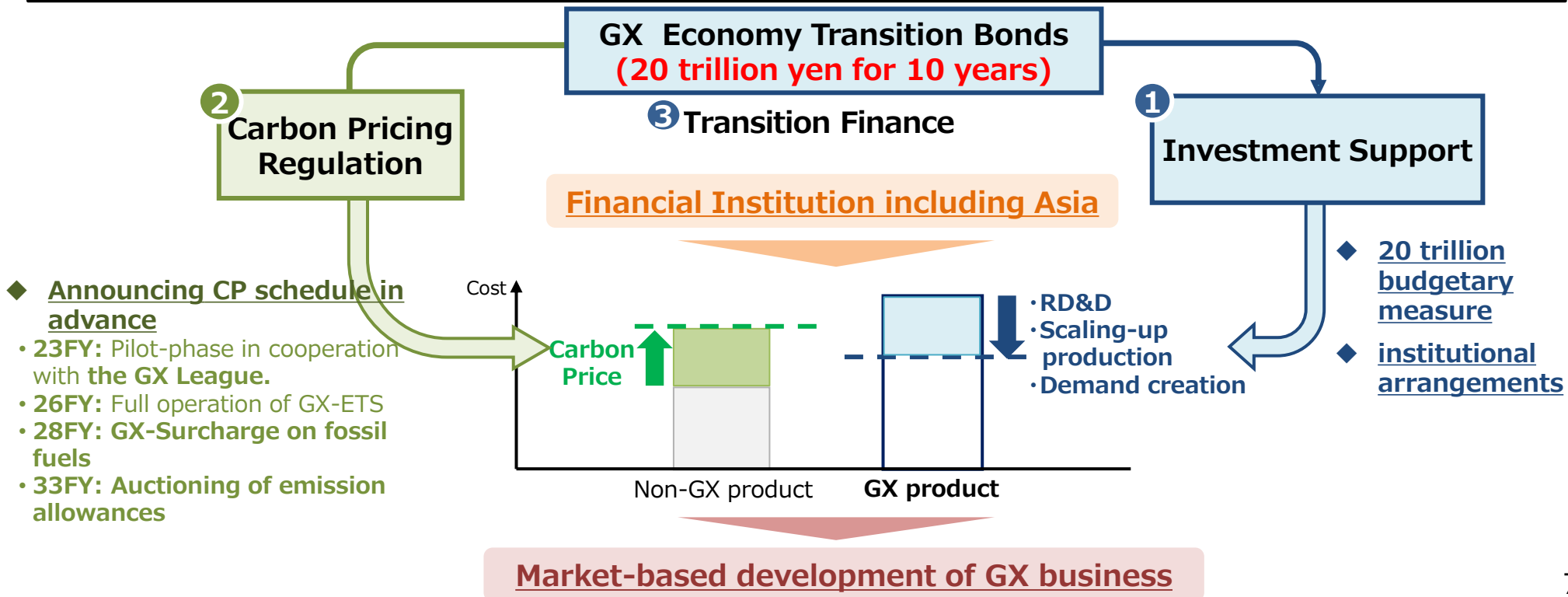
- ① **Efforts to promote energy saving**
- ② **Renewable energy as a major source**
 - Substantial grid enhancement
 - Next generation solar panels, floating offshore wind
- ③ **Utilization of nuclear energy**
 - Developing next generation reactors with substantially enhanced safety features
 - Extension of operation periods of existing reactors with a premise of safety as a top priority
- ④ **Other efforts**
 - Support for RDD&D of hydrogen, ammonia, CCS/CR, E-fuel, batteries and others

2. Implementation and realization of “Pro-Growth Carbon Pricing Concept”

- ① **Upfront investment support provided through issuing GX Economy Transition Bonds (20 trillion yen in 10 years)**
- ② **Adoption of Pro-Growth Carbon Pricing**
 - i. Emission Trading System 【FY2026~】
 - ii. Auction of emission quotas by power producers 【FY2033~】
 - iii. Carbon surcharges for fossil fuels 【FY2028~】
- ③ **Utilization of new financial measures**
- ④ **International cooperation**
- ⑤ **Social measures to promote GX (just transition, demand creation, SMEs)**

Pro-Growth Carbon Pricing Framework

- To promote the GX investment, a "Pro-Growth Carbon Pricing Framework" will be implemented.
- ① Issuing GX Transition Bonds (20 trillion yen for 10 years)
- ② Implementing carbon pricing mechanisms to incentivize early GX investment later
 - (1) Full-scale operation of ETS in heavy-emission industries [from FY2026]
+ Allowance **auktioning** for power generation companies [from FY2033]
 - (2) Introducing **GX-Surcharge** on fossil fuel supply [from FY2028]
- ③ Significantly enhancing finance support programs for public-private partnership now



Investment Promotion Measures Taking Advantage of GX Economy Transition Bonds

| | | Public & private investment | Key investment promotion measures | Already supported (FY2022~FY2023) | Budget support After FY2024 | Note |
|----------------|----------------------------------|-----------------------------|--|---|-----------------------------|--|
| Manufacturing | Steel | 3 trillion yen~ | <ul style="list-style-type: none"> Support for capital investment for conversion of manufacturing processes | | 480 billion yen (5 years) | <ul style="list-style-type: none"> Total amount of capital investment support for four industries (iron and steel, chemical, pulp and paper, cement) is 1.3 trillion yen over 10 years Provide R&D support for hydrogen reduction steel making, etc. through the Green Innovation (GI) Fund, and tax credits based on green steel/green chemical production volume |
| | Chemicals | 3 trillion yen~ | | | | |
| | Paper and Pulp | 1 trillion yen~ | | | | |
| | Cement | 1 trillion yen~ | | | | |
| Transportation | Automobiles | 34 trillion yen~ | <ul style="list-style-type: none"> EV for passenger cars EV for commercial vehicles | 219.1 billion yen 54.5 billion yen | | <ul style="list-style-type: none"> Provide R&D support for next-generation batteries/motors, synthetic fuels, etc. through the GI Fund, and tax credits based on production volume of EVs |
| | Batteries | 7 trillion yen~ | <ul style="list-style-type: none"> Production facility Storage batteries for stationary use | 597.4 billion yen | 230 billion yen | <ul style="list-style-type: none"> Allocate 230 billion yen to the Economic Security Fund Provide R&D support for all solid-state batteries, etc. through the GI Fund |
| | Aircraft | 4 trillion yen~ | <ul style="list-style-type: none"> Core technologies for next-generation aircraft | | | <ul style="list-style-type: none"> Consider measures based on the "Next-Generation Aircraft Strategy" to be formulated by the end of FY2023 |
| | SAF | 1 trillion yen~ | <ul style="list-style-type: none"> SAF manufacturing and supply chain development | | 340 billion yen (5 years) | <ul style="list-style-type: none"> Provide R&D support for SAF and next-generation aircraft through the GI Fund, and provide tax credits based on SAF production volume, etc. |
| | Ships | 3 trillion yen~ | <ul style="list-style-type: none"> Production facilities (e.g. as zero-emission vessels) | | 60 billion yen (5 years) | <ul style="list-style-type: none"> Provide R&D support for ammonia ships, etc., through the GI Fund |
| Life-related | Life-related Industry | 14 trillion yen~ | <ul style="list-style-type: none"> Retrofitting homes with insulated windows High-efficiency water heaters Retrofitting of commercial, educational and other buildings | 235 billion yen 58 billion yen 33.9 billion yen | | <ul style="list-style-type: none"> 2 trillion yen support for 3 years including automobiles, etc (including support from sources other than GX Economy Transition Bond) |
| | Resource Circulation | 2 trillion yen~ | <ul style="list-style-type: none"> Building a recycling-oriented business model | | 30 billion yen (3 years) | <ul style="list-style-type: none"> Provide R&D support for pyrolysis technology, etc., through the GI Fund |
| | Semiconductor | 12 trillion yen~ | <ul style="list-style-type: none"> Production facilities for power semiconductors, etc. Technology development of AI semiconductors, optoelectronic integration, etc. | 432.9 billion yen 103.1 billion yen | | <ul style="list-style-type: none"> Provide R&D support for power semiconductors, etc., through the GI Fund |
| Energy | Hydrogen and its Derivatives | 7 trillion yen~ | <ul style="list-style-type: none"> Support for the price difference with existing raw materials/ fuels Development of supply centers for hydrogen, etc. | | 460 billion yen (5 years) | <ul style="list-style-type: none"> Total amount of support focusing on price gaps at 3 trillion yen for 15 years from the beginning of supply Provide R&D support for supply chain establishment through the GI Fund Consider support for facility development based on feasibility studies |
| | Next-Generation Renewable Energy | 31 trillion yen~ | <ul style="list-style-type: none"> Supply chain of perovskite solar cells, floating offshore wind, and water electrolyzers | | 420 billion yen (5 years) | <ul style="list-style-type: none"> Total amount of support to be approximately 1 trillion yen over 10 years Provide R&D support for perovskite solar cells, etc. through the GI Fund |
| | Nuclear Power | 1 trillion yen~ | <ul style="list-style-type: none"> Development of next-generation innovative reactors | 89.1 billion yen | 160 billion yen (3 years) | |
| | CCS | 4 trillion yen~ | <ul style="list-style-type: none"> Building a CCS value chain | | | <ul style="list-style-type: none"> Consider measures based on the results of feasibility studies of advanced CCS projects, etc. |
| | Cross-sectoral measures | | <ul style="list-style-type: none"> Energy saving subsidies for SMEs, support for deep tech start-ups, R&D by the GI Fund, financial support by GX organization, regional decarbonization grants, etc. | 1,149 billion yen | 166 billion yen | <ul style="list-style-type: none"> 700 billion yen support for 3 years 200 billion yen support for 5 years 2 trillion yen in the third supplementary budget for FY2020 Financing support through debt guarantees, etc. |
| | Tax measures | | <ul style="list-style-type: none"> New tax credits based on production volume of green steel, green chemicals, SAF, EVs, etc. | | | |

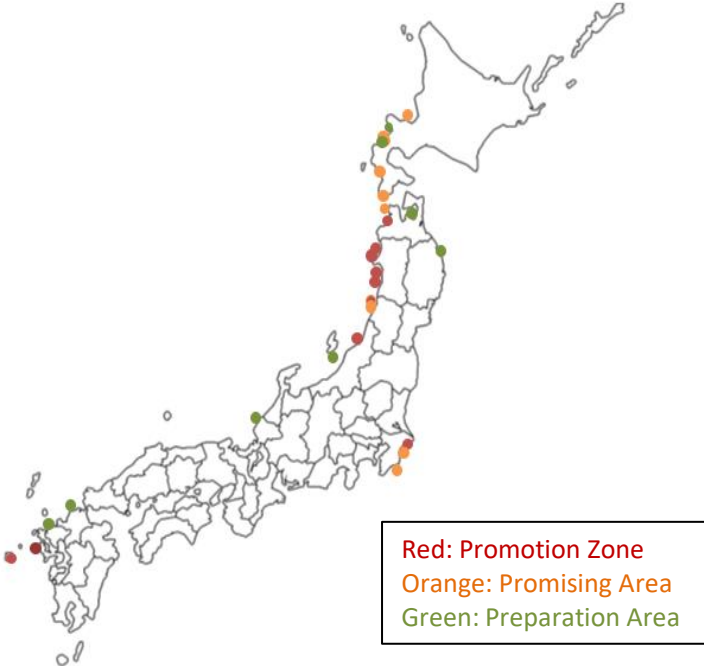
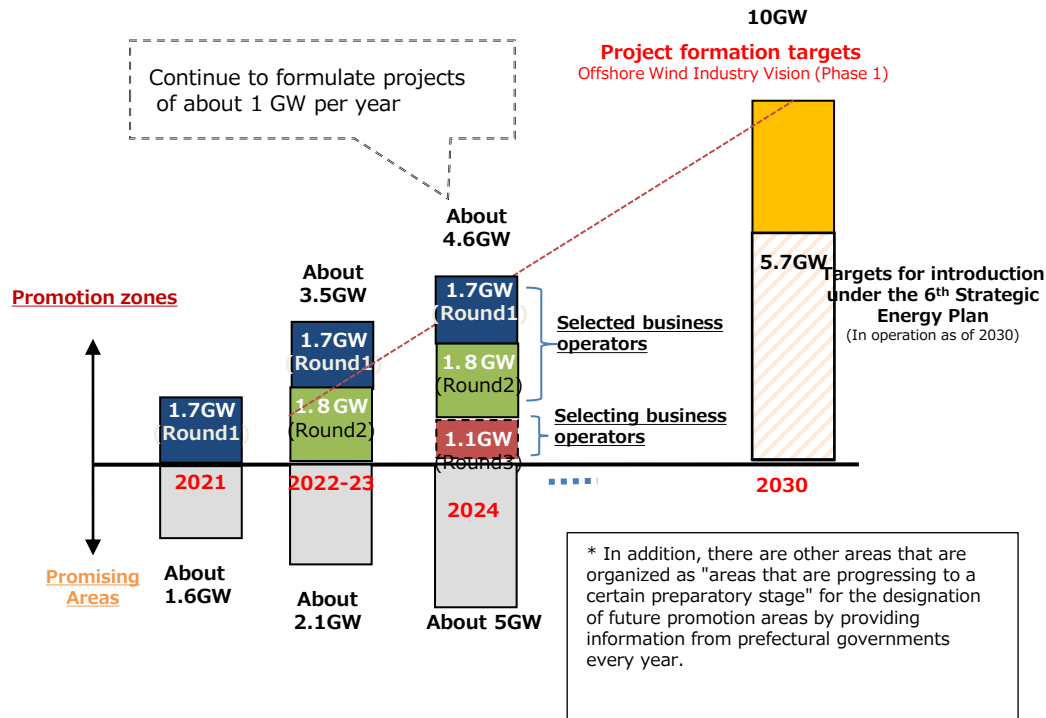
Budget support after FY2024: **Approx. 2.4 trillion yen** Budget including already supported are in blue figures: **Approx. 13 trillion yen**

Accelerating offshore wind power deployment

- The Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities is a law that publicly solicits offshore wind power generation companies and permits them to occupy sea areas for 30 years (enforced on April 1, 2019).
- In December 2020, the "Offshore Wind Industry Vision (Phase 1)" set targets of continuously developing appr. 1 GW/year of projects, total 10 GW by 2030 and 30~45 GW by 2040.
- Act for Promoting Offshore Wind in EEZ is under the debate in the Diet.

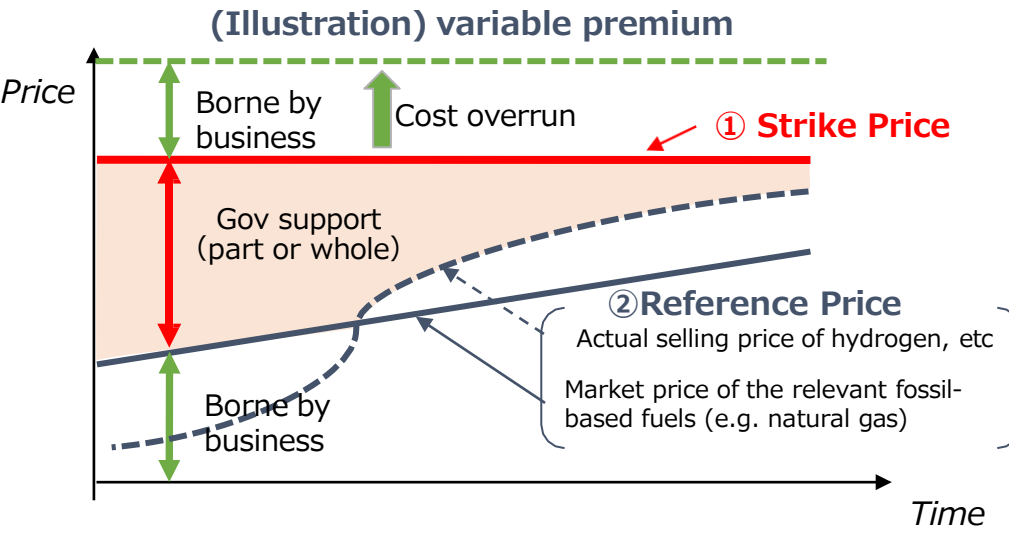
Project formation to achieve 10 GW

Promotion Zones



Hydrogen price gap support scheme

- The Government plans to provide a **15-year long support to suppliers** who aim to **develop a commercial- scale pilot supply chain of low-carbon hydrogen and its derivatives** which meets the Japan’s primary energy policy (S+3E*). * “Energy Security”, “Economic Efficiency”, “Environment” and “Safety”
- Key requirements: (1) **supply to hard-to-abate sectors and applications**, such as iron and chemicals; (2) contribution to domestic GHG emission reductions in compliance with agreed international CO2 accounting rules, and (3) **starting supply by FY2030 and must continue for another 10 years following the support period.**
- Two other main evaluation criteria: "policy perspectives" (e.g. diversification of supply sources, enhancement of industrial competitiveness, and contribution to economic growth for Japan); and "project deliverability" (e.g. certainty of off-takers and adequacy of construction plans and financial plans.)
- **Pilot project applications must be submitted under the joint names of the supplier(s) and the user(s)** with a view that Government can confirm that the project will lead the users to transform their energy and raw materials.



Key project evaluation criteria – to be assessed holistically

- (1) Policy perspectives
 - Energy policy (S+3E)
 - Alignment with the GX Promotion Policy
- (2) Project deliverability
 - Certainty of the business plan
 - Appropriate allocation of risks between Government and the business

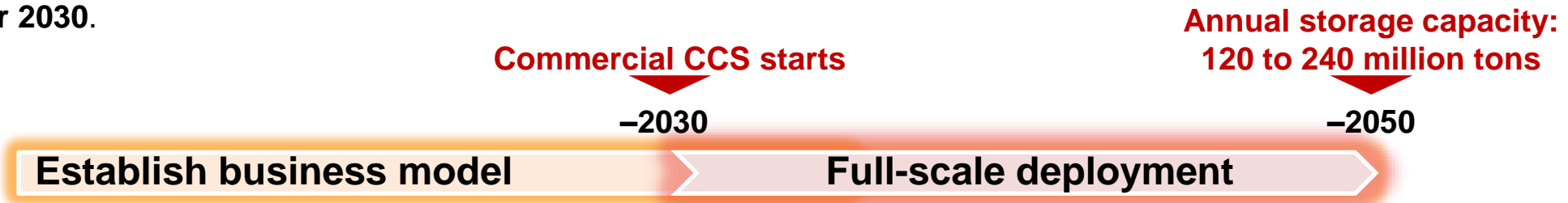
Commercializing CCS by 2030 (CCS Roadmap)

[Principles]

To implement CCS systematically and rationally to promote the sound development of CCS business in Japan with minimal social costs, thereby contributing to the development of Japan's economy and industry, securing a stable energy supply, and the achievement of carbon neutrality.

[Objectives]

A business environment for commencement shall be prepared by 2030, involving cost reduction, public understanding, overseas CCS promotion, and CCS Business Act legislation, **based on the rough estimation of enabling CO₂ storage of about 120 to 240 million tons as of 2050**, and full-scale CCS business shall deploy after 2030.



[Key actions]

- (1) Government support for CCS business
- (2) Efforts to reduce CCS costs
- (3) Promotion of public understanding of CCS business
- (4) Promotion of overseas CCS business

(5) The CCS Business Act (currently under the Diet debate)

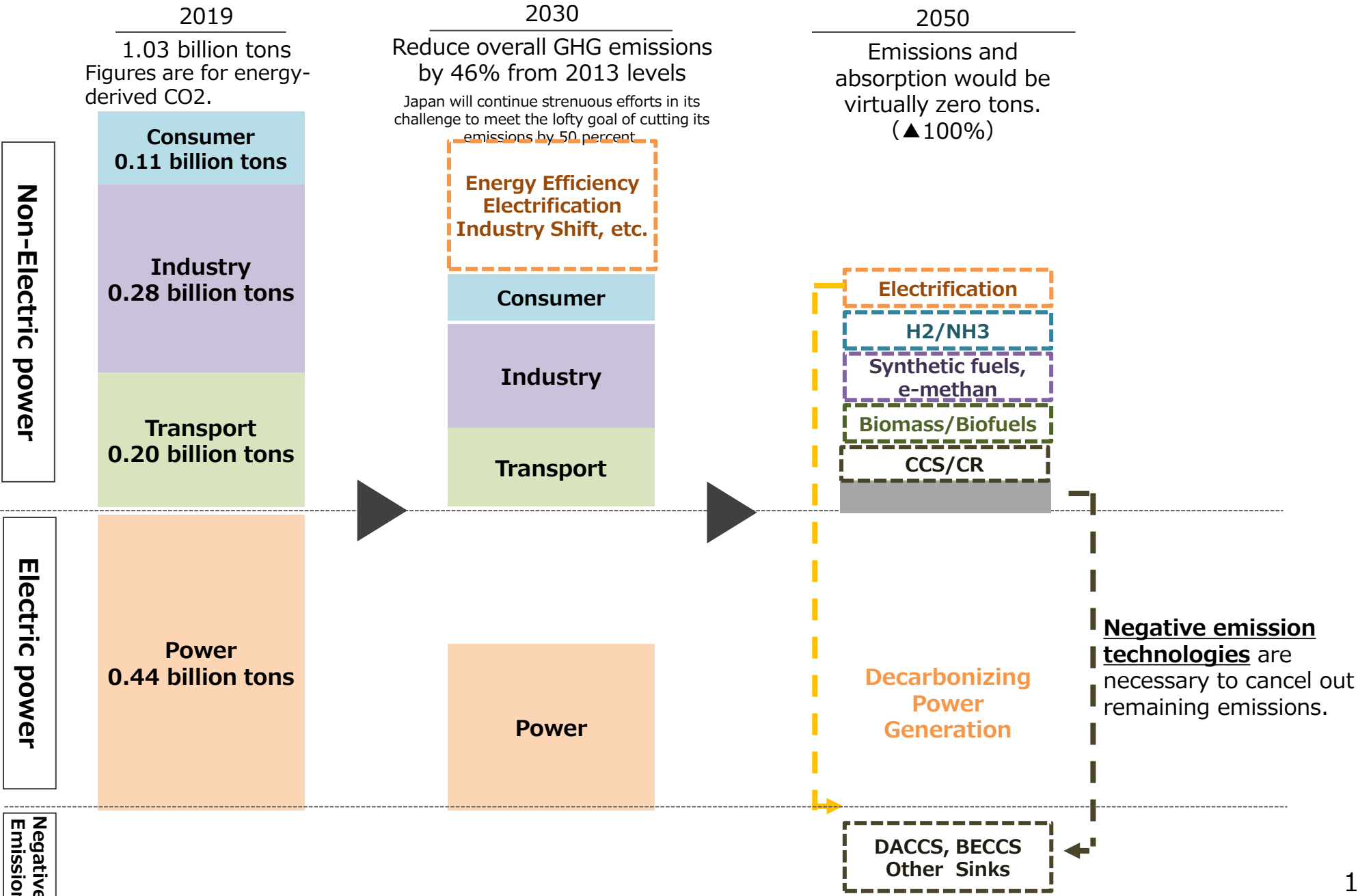
- (6) Formulation and review of the CCS Action Plan

1. Global Trend of Green Transformation
and Japan's Response

2. Transition Finance

3. Climate Transition Bond

Decarbonization pathways - Simple, but hard to implement

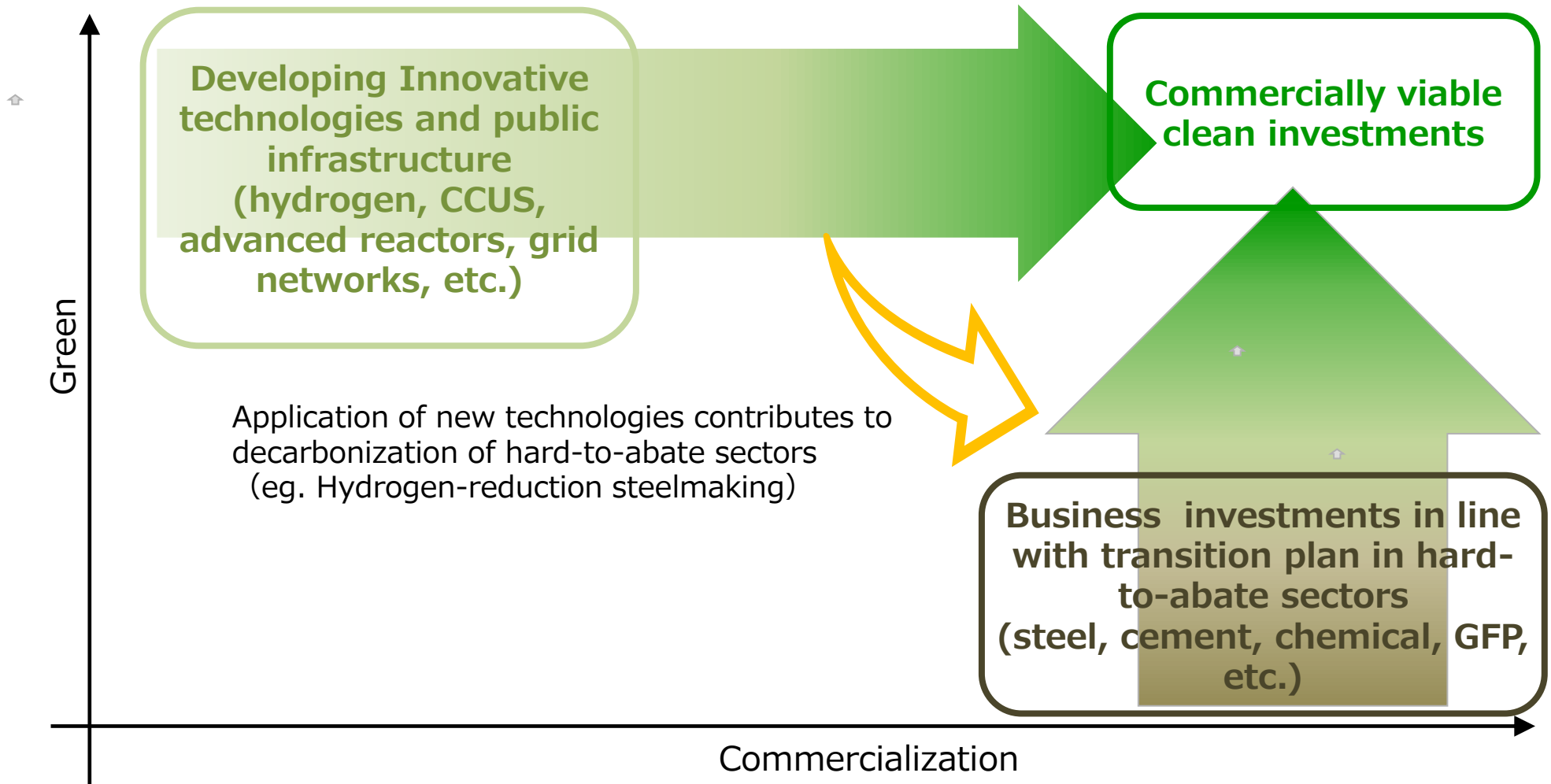


Financial needs for decarbonizing hard to abate sectors

- To pursue decarbonization, economic growth and stable energy supply, we need finance for both followings, especially for hard to abate sectors.

① **development and deployment of innovative decarbonization technologies**

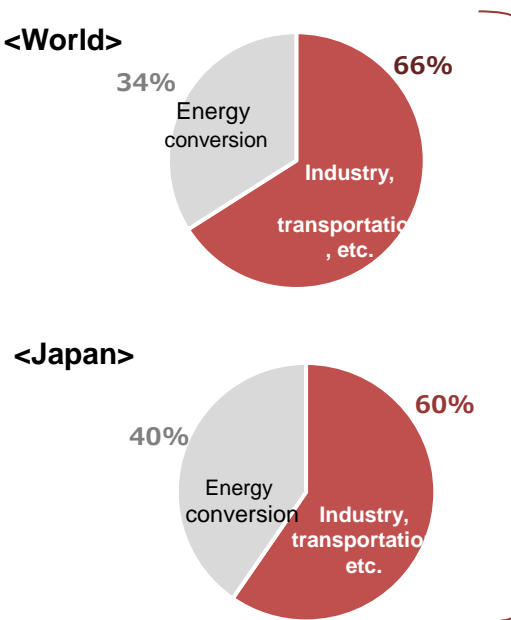
② **step-by-step emission reduction efforts for immediate emission reductions**



Role of transition finance to aim for Net Zero

- **Decarbonizing power sector and promoting electrification** are the key to pursue immediate emission reduction.
- Although decarbonizing hard to abate sectors such as process heat, carbothermal reduction and heavy transportation is essential to achieve Net Zero, technologies to decarbonize these sectors are not well established.
- It is necessary to promote “transition finance”, which can cover both radical/innovative (e.g. hydrogen reduction steelmaking) and incremental/immediate emission reduction efforts (e.g. energy efficiency, modal shift).
- **By issuing transition bonds after obtaining SPO from a third-party evaluation agency, the Government of Japan intends to:**
 - (1) Define the features and functions of transition finance
 - (2) Expand the market for transition finance
 - (3) Enhance the use of transition finance by private businesses and financial institutions.

CO2 emissions by sector in the world and Japan

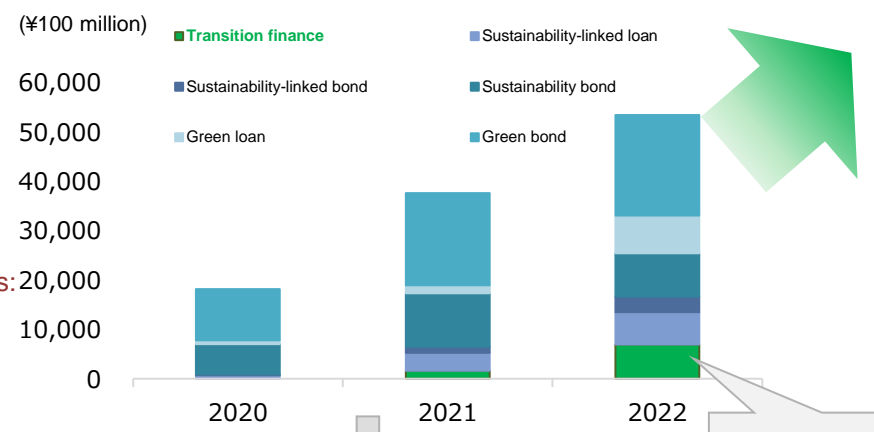


In the industrial sector, etc., electrification is difficult in the following areas:

- ① high-temperature process heat,
- ② steel production
- ③ cement production
- ③ chemicals production
- ④ heavy transportation etc.

Source: Compiled from IPCC "Emissions Trends and Drivers" and "GHG Inventory (Energy-derived CO2 emissions)" (before distribution of electricity and heat)

Activation of transition finance



In Asia, it is said that there will be funding needs for decarbonization totaling \$40 trillion by 2050.

Transition finance
Cumulative total of
¥1 trillion

Source: Compiled from information published by financial institutions and companies

Japan's 4 step policy tools on Climate Transition Finance

G7 Leaders Summit (May 2023, Hiroshima)

- **Transition finance**, in line with keeping a limit of 1.5°C temperature rise within reach, avoiding carbon lock-ins and based on effective emissions reduction, **has a significant role in advancing the decarbonization of the economy as a whole.**

- Although green projects have attracted investment, transition projects are still not well funded.
- Companies are expected to develop credible transition plans to obtain transition finance.
- To encourage finance flow for transition, the Japanese government take 4-step-policy. (the national strategy/guidelines, sector roadmaps, model projects and follow-up guidelines)

1. Basic Guidelines

- ✓ FSA, MOE and METI formulated the Guidelines to establish transition finance in line with the ICMA transition handbook.



2. Sector Roadmaps

- ✓ Roadmaps with technologies for transition is formulated for 8 sectors: **iron & steel, chemical, electricity, gas, oil, cement and paper & pulp, and automobiles.**
- ✓ The roadmaps can be referred by companies to formulate their strategies and pathways, and by financial entities to evaluate those of clients

3. Model Projects

- ✓ 21 model projects from shipping, steel, aviation, chemical, energy and heavy industry sectors.
- ✓ **The market of transition finance has reached 1 trillion yen cumulatively.**

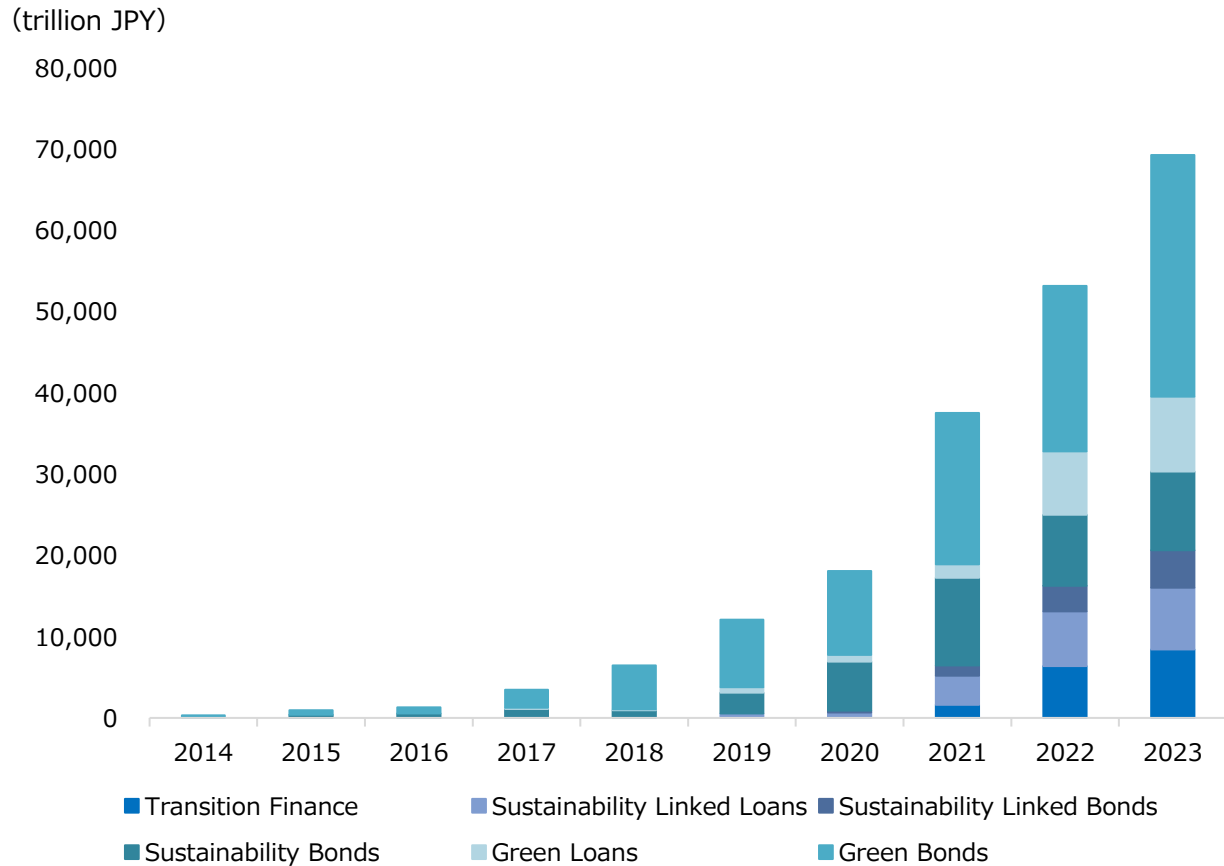
4. Follow-up Guidance

- ✓ **Guidance for financiers (especially bond issuers)** in following up after the issuance of transition finance was released in June 2023



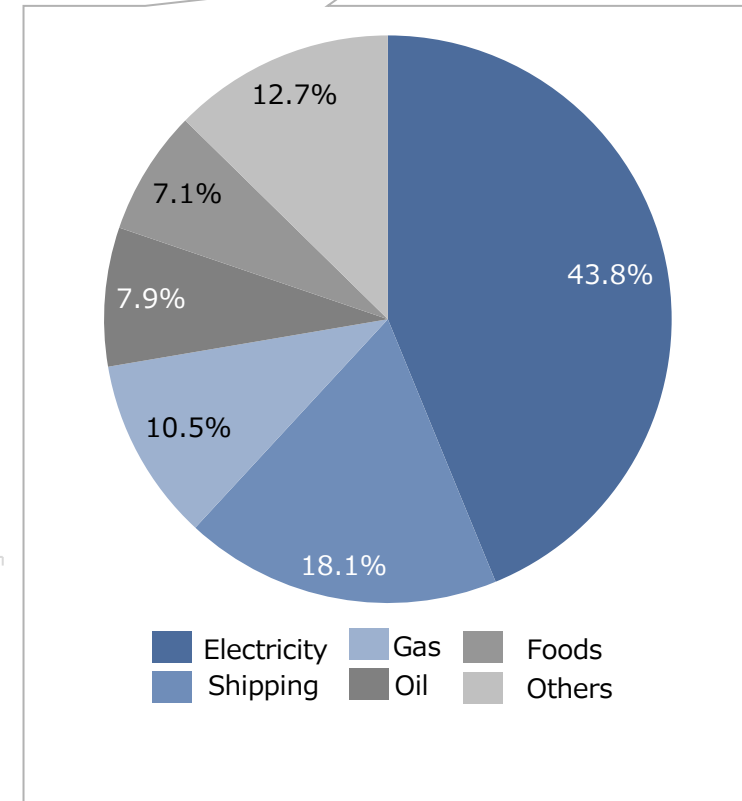
Trends in amount of transition-labeled bonds and loans

■ The cumulative amount of transition-labeled bonds and loans has grown and surpassed 1.6trillion JPY.



the cumulative amount of transition-labeled bond and loans In Japan (Jan.2021-Dec.2023)

Apprx. **1.6** trillion JPY



Source) MOE "Green Finance Portal" (<https://greenfinanceportal.env.go.jp/>), METI "Transition Finance HP" (https://www.meti.go.jp/policy/energy_environment/global_warming/transition_finance.html), Other public information.

2023 G7 Hiroshima Summit –Transition Finance

- G7 Hiroshima Summit was held in May 2023.
- The importance of transition finance to advance the decarbonization of the whole economy was agreed among the leaders.
(also agreed among G7 Ministers' Meeting on Climate, Energy and Environment & Finance Ministers and Central Bank Governors' Meeting)



Leaders' Communiqué

⋮

We remain committed to supporting the implementation and monitoring of G20 Sustainable Finance Roadmap.

We highlight the need for corporates to implement their net-zero transition in line with the temperature goal of the Paris Agreement based on credible corporate climate transition plans.

We also highlight that transition finance, in line with keeping a limit of 1.5°C temperature rise within reach, avoiding carbon lock-ins and based on effective emissions reduction, has a significant role in advancing the decarbonization of the economy as a whole.

⋮



1. Global Trend of Green Transformation
and Japan's Response

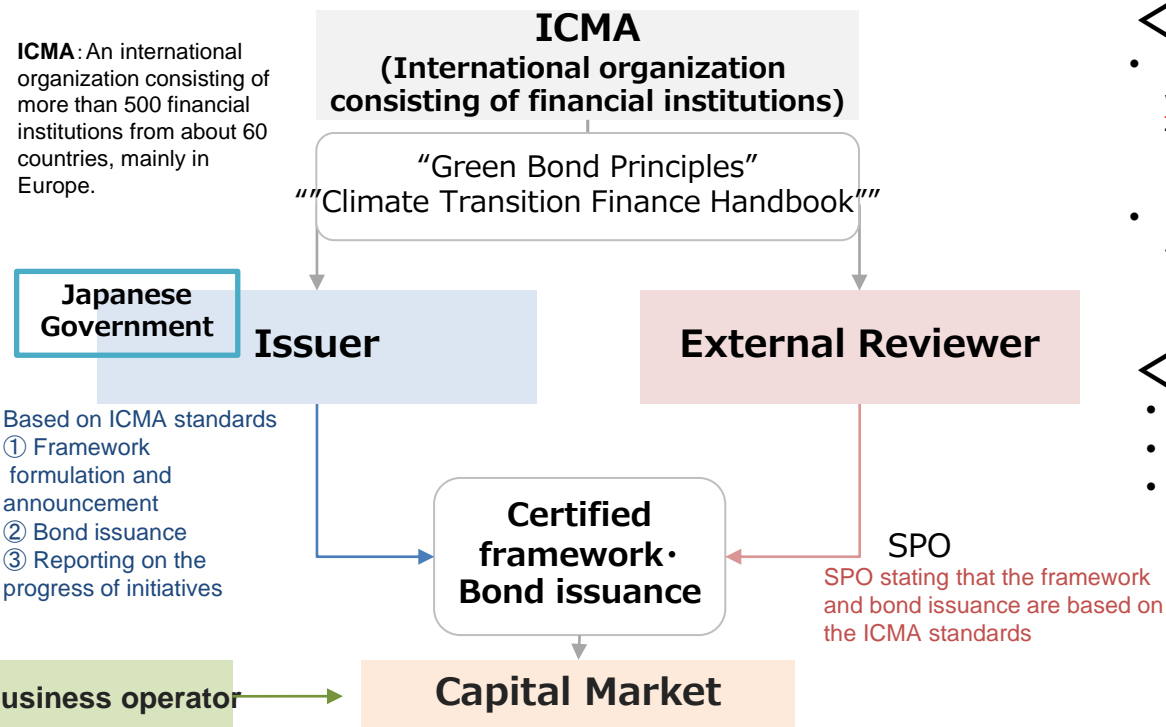
2. Transition Finance

3. Climate Transition Bond

GX Economy Transition Bond (Climate Transition Bond)

- The GX Economy Transition Bonds (market name: Climate Transition Bond) is the first government bond with a title of “transition bond” (Issued in February, 2024, ¥1.6 trillion for the first batch)
- The framework (i.e. governance, use of funds, etc.) of the Climate Transition Bond is developed based on the GX Promotion Strategy.
- Second-Party Opinions (SPO) for the Framework, provided by DNV (Norway) and JCR (Japan), assures the consistency of the framework with ICMA’s standard.

Flows of issuance of transition bond



About SPO

<DNV>

- DNV **confirmed that the Framework is aligning with international standards** such as ICMA Climate Transition Finance Handbook and Green Bond Principles.
- DNV assesses that the Framework provides transparent and reliable mechanisms to ensure fair investment opportunities.

<JCR>

- **Overall Evaluation : Green 1 (T)(F) (Top Category)**
- Greenness/Transition Evaluation : gt1 (Top Category)
- Management, Operation and Transparency Evaluation : m1 (Top Category)







<Japanese>



<English>



Climate Transition Bond Framework: Use of Proceeds

| Major categories | | Eligibility Criteria | Representative Use of Proceeds (Eligible Projects) |
|------------------|--|---|--|
| 1 | Energy efficiency  | Promotion of thorough energy efficiency improvement | - Promote the spread of energy-efficient appliances |
| | | Houses and buildings | - Support for building new houses and buildings with high energy efficiency and retrofitting to improve energy efficiency |
| | | Digital investment aimed at decarbonization | - Facilitating the development of and investment in energy efficient semiconductors, photonics electronics convergence technologies, etc. |
| | | Battery industry | - Investments in plants manufacturing batteries together with their material and components |
| 2 | Renewable energy  | Making renewable energy a major power source | - Floating offshore wind - Next-generation solar cells (perovskite) |
| | | Infrastructure | - Development of cities and communities that will help decarbonization |
| 3 | Low-carbon and Decarbonized energy  | Utilization of nuclear power | - Next-generation advanced reactors with built-in new safety mechanisms |
| | | Establishing electricity and gas markets to achieve carbon neutrality | - Promoting zero-emission thermal power - Development of submarine DC transmission systems, etc. |
| 4 | Clean transportation  | GX in transport sector | - Support for the introduction of next-generation vehicle - Developing demonstration aircraft by 2030s and spreading the use of zero-emissions ships, etc. |
| | | Infrastructure (repeat) | - Development of cities and communities that will help decarbonization |
| 5 | Circular economy adapted products, production technologies and processes  | Restructuring the manufacturing industry (fuel and feedstocks transition) | - Development and introduction of innovative technologies such as hydrogen reduction for steelmaking - Conversion to Carbon-Recycling production systems |
| | | Facilitating introduction of hydrogen and ammonia | - Building supply chain both in domestically and internationally - Research and development as well as the introduction support of both production and usage of hydrogen derived from excess renewable energy sources |
| | | Carbon Recycling and CCS | - Support for research and development of Carbon Recycling fuel |
| 6 | Environmentally sustainable management of living natural resources and land use and Circular economy  | Food, agriculture, forestry, and fisheries | - Decarbonization of agriculture, forestry and fisheries |
| | | Resource circulation | - Investment to accelerate the resource circulation such as plastics, metals, sustainable aviation fuel (SAF), etc |

CBI Certification

- ◆ The first issuance of the Japan Climate Transition Bonds (1.6 trillion JPY issued in Feb 2024) received CBI certification.
- ◆ CBI (Climate Bond Initiative) is an international NPO promoting the mobilization of capital for climate action, who have set the Climate Bond Standards.

CBI(Climate Bonds Initiative)

- NPO founded in 2012 based in London. Aims to mobilize 100 trillion dollars of the bond market for climate action and published the Climate Bond Standards. Issues reports on the green bond market, relevant policies, and provides consulting.
- The CBI certification scheme is a labelling scheme for issuers, assets or other debt instruments to ensure their consistency with the goals of the Paris Agreement. Requirements on the use-of-proceeds, governance, reporting, etc. are described in detail.



CBI Certification for First Issuance of JCTBs

- JCR conducted the verification for the CBI certification process and released the CBI Verification Report on February 8th, 2024.
- The report states that the planned use-of-proceeds* for the first issuance (1.6 trillion JPY) adhere to the CBS.
*confirmed alignment for roughly 95% of projects, excluding those without CBI criteria.

<CBI Press Release>

“[The GX Plan] underscores Japan's commitment to its 2030 greenhouse gas (GHG) reduction goals, and to its vision for carbon neutrality by 2050. The Bond is Certified under the Climate Bonds Standard, offering investors assurance on the environmental objectives of the use of the proceeds and signifying alignment with best practice global standards.”

(Comment from CBI CEO Sean Kidney)

“This bond shows clearly how governments, and others, can raise funds to invest in that transition. It marks a significant milestone in transition finance.”

Results of the First Auction (Feb 2024)

- First auction for the Climate Transition Bonds (the first of its kind as a sovereign transition bond) was conducted on February 14th 2024. Auctions for 5-year bonds were held on February 27th.
- Based on the auction results and market reception, it can be recognized that there was a certain level of understanding from a wide range of investors.

Auction Results

| | 10-year (Auction: Feb 14) | 5-year (Auction: Feb 27) |
|--|---|--------------------------------------|
| Nominal Coupon | 0.7%/yr | 0.3%/yr |
| Amount of Competitive Bids | 2.3212trillion JPY (roughly 2.9x) | 2.7145trillion JPY (roughly 3.4x) |
| Amount of Bids Accepted | 799.5billion JPY | 799.8billion JPY |
| Yield at Lowest Price Accepted | 0.740% | 0.339% |
| Lowest Price Accepted | 99.62 JPY per 100 JPY | 99.81JPY per 100 JPY |
| Allotment of Bids at Lowest Price Accepted | 67.7966% | 94.0540% |