

EFFORTS TO REALIZE SUSTAINABLE SOCIOECONOMIC SYSTEMS

For Japan, achieving the targets of net-zero greenhouse gas (GHG) emissions by 2050 and 46% reduction in FY 2030 (from FY 2013 levels) will not be easy. It is essential to view the period up to 2030 as a “critical decade” and promote the transition to a sustainable socioeconomic system, with decarbonization being one of the most important challenges. Given the numerous social challenges our country faces, we need to work on new avenues for sustainable growth by implementing integrated initiatives, such as the establishment of the Circular and Ecological Economy (see Chapter 2), with the aim of simultaneously achieving net-zero GHG emissions, circular economy, and nature-positive, thus ensuring a high quality of life in the future. Societal changes encompassing the economy, society, politics, and technology are needed to

achieve nature-positive, halt and reverse biodiversity loss, and put nature on a path to recovery. Advancing toward circular economy will accelerate resource circulation, which in turn will help reduce GHG emissions throughout the entire product lifecycle and contribute to the realization of net-zero GHG emissions. The environment, resource circulation, and biodiversity are intertwined, and a holistic approach is needed to effectively address the related challenges.

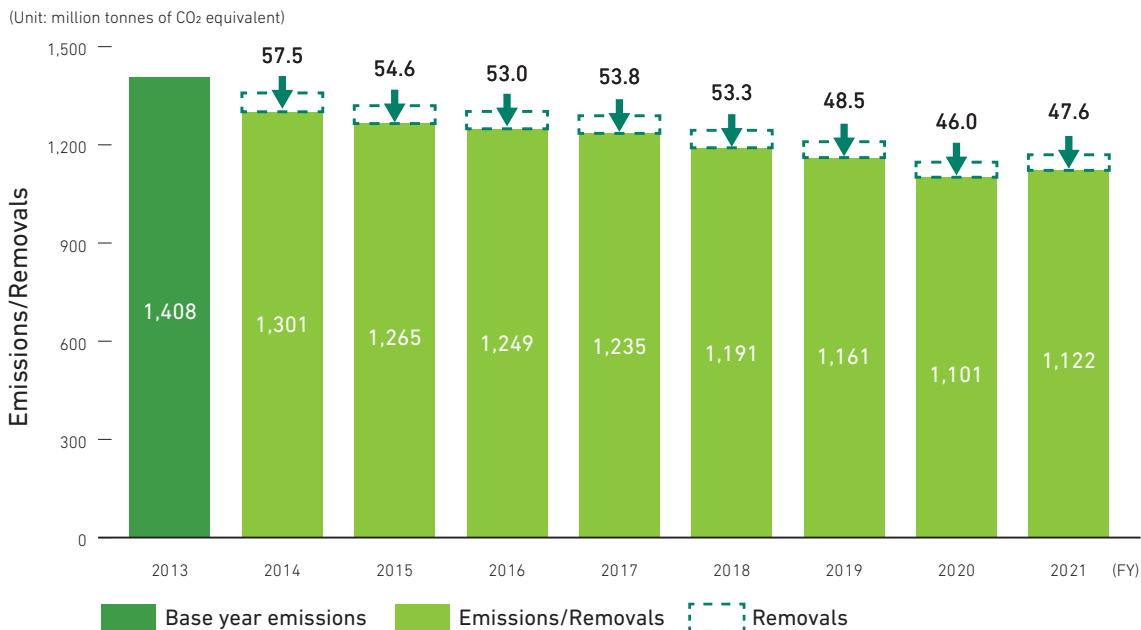
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1 JAPAN'S GREENHOUSE GAS EMISSIONS AND REMOVALS

Japan's GHG emissions and removals (total emissions less removals) in FY 2021 were 1,122 million tonnes of CO₂ equivalent (Mt CO₂ eq.) (final figures), an increase of 2.0% (21.5 Mt CO₂ eq.) from FY 2020. This was mainly due to an increase in energy consumption that reflected the recovery of the economy, which had been sluggish because of COVID-19. Against the base-year FY 2013, the FY 2021 figure represents a decrease of 20.3% (285.3 Mt CO₂ eq.). The amount of CO₂

absorbed by forests and others in FY 2021 was 47.6 million tonnes. This was the first increase in absorption in four years at 3.6% over FY 2020. This is believed to be mainly due to the steady implementation of forest improvement projects and promotion of wood use. In reporting GHG emissions and removals to the United Nations for FY 2021, for the first time, we included 2,300 tonnes absorbed by mangrove forests, one of the blue carbon ecosystems.

Japan's Greenhouse Gas Emissions and Removals



Source: Ministry of the Environment

2 NET-ZERO GREENHOUSE GAS EMISSIONS

Towards realization of a green transformation

In February 2023, Japan's cabinet approved the Basic Policy for the Realization of Green Transformation (GX) following discussions with the GX Implementation Council. By implementing GX policies, Japan aims to achieve its international commitment of 46% reduction in GHG emissions in FY 2030 and net-zero GHG emissions by 2050. Japan also intends to

transform its energy supply and demand structure, which would lead to a stable and inexpensive energy supply. Japan aims to reform its industrial and social structures and create a society in which all citizens, including future generations, can live with hope. To fulfill Japan's international commitments, improve industrial competitiveness, and simultaneously

realize economic growth, investments are required in many fields. According to one estimate, more than 150 trillion yen for 10 years is required to promote GX. To bring in this enormous GX investment through public-private partnerships, a Pro-Growth Carbon Pricing Concept will be swiftly realized and implemented. The Pro-Growth Carbon Pricing

Concept includes three measures. One of them is bold assistance to initial investments of 20 trillion yen through GX Transition Bonds with other policy supports and regulations. The other two measures are incentives for upfront GX investments through carbon pricing (emissions trading system and GX-Surcharge) and other financial schemes.

Decarbonization Leading Areas

One of the measures based on the Regional Decarbonization Roadmap is the selection of Decarbonization Leading Areas. Decarbonization Leading Areas refer to areas that are committed to achieving net-zero CO₂ emissions associated with the electric power consumption of the consumer sector (residential, commercial, and other sectors) in line with the national goal of net-zero GHG emissions by 2050. They are also committed to achieving other GHG emission reductions, including in the transport sector and heat use, according to their own characteristics and are

consistent with the overall national target for FY 2030. These areas serve as role models for nationwide decarbonization efforts. We plan to select at least 100 areas by FY 2025 and complete the program by FY 2030. In this way, we hope to offer simultaneous solutions to the challenges that exist in many local communities, including farming villages, fishing villages, mountain villages, remote islands, and urban areas, and contribute to their revitalization. By the end of FY 2022, 46 areas have been selected as Decarbonization Leading Areas through two public solicitations.

Support through regional financial institutions: Japan Green Investment Corp. for Carbon Neutrality

Regional financial institutions, which support regional economies financially, can be directly affected by the sustainability of the region. They are expected to explore concrete measures together with their business partners as the socioeconomic structure shifts toward net-zero GHG emissions.

As part of the ESG Regional Finance Promotion Program, the Ministry of the Environment is promoting, in cooperation with leading regional financial institutions, the creation of business models to solve regional issues and better utilize local resources. In addition, we support regional financial institutions that disclose information in compliance with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), a framework for the disclosure of climate-related information.

In May 2022, a law was enacted to partially amend the Act on Promotion of Global Warming Countermeasures, and the Japan Green Investment Corp. for Carbon Neutrality (JICN) was established with funds from the fiscal investment and loan program to provide focused and intensive support to private businesses and others who engage in decarbonization projects with enthusiasm. JICN funding will have a pump-priming effect on the inflow of private funds into “blended finance,” which is a combination of public and private funds. We will make the flow of funds required for decarbonization wider and faster and contribute to the socioeconomic development and revitalization of the regions as well as to the creation of new values through the accumulation of knowledge and human resource development.

Needed innovation for the transition to a decarbonized society and startup assistance

Promoting green innovation requires assistance in technological development and other respects to those startups and future entrepreneurs who are pioneering new environmental businesses (“environmental startups”). The Ministry of the Environment extends various types of assistance to environmental startups for green innovation R&D and commercialization depending on their stages of growth. These include R&D assistance specifically designed for environmental startups, the creation of business opportunities through pitch events and commendations, and endorsement by performance demonstration of environmental technologies.

The Greenhouse Gases Observing Satellite (GOSAT), a joint mission project of the Ministry of

the Environment, National Institute for Environmental Studies, and JAXA, has been observing the concentrations of carbon dioxide and methane worldwide since its launch in 2009. GOSAT-2, its successor satellite with enhanced functions for improved observation accuracy, was launched in 2018. Currently, GOSAT-GW, which will progressively succeed the missions of these two satellites, is under development. The data acquired by the GOSAT project are used to identify large emission sources and help ensure the transparency of the emissions data that the countries report under the Paris Agreement. In this way, we are promoting the transition to a decarbonized society.

Best Practice

CONTRAIL Project, atmospheric observation by aircraft

The CONTRAIL Project was launched in 2005 to observe GHG extensively using two observation instruments, Continuous CO₂ Measuring Equipment (CME) and Automatic air Sampling Equipment (ASE), which are installed on aircrafts serving regular international passenger flights of Japan Airlines (JAL). This was the world's first attempt at regular and continuous observation of GHG using a commercial

aircraft. The observation results obtained from the passenger aircraft are not only used for the direct understanding of the concentration distribution of GHG along the flight route but also to improve the accuracy of the GOSAT observations through comparison and validation. CONTRAIL is an indispensable tool for accurately understanding the global distribution of the concentration and variations in GHG.



CME
Continuous CO₂ Measuring
Equipment



ASE
Automatic air Sampling
Equipment

JAL passenger aircraft and two types of observation instruments

Source: National Institute for Environmental Studies

Joint Crediting Mechanism and overseas expansion of environmental infrastructure

Japan actively implements the Joint Crediting Mechanism (JCM) to contribute to GHG emission reductions by introducing advanced decarbonization technologies and infrastructure to developing countries. In 2022, the number of JCM partner countries increased to 25 with the addition of eight new countries. To date, more than 240 decarbonization projects have been implemented, including the introduction of renewable energy and energy-saving technologies.

With a view to building up “High Integrity Carbon Markets” that include the JCM and are in line with the provisions of Article 6 of the Paris Agreement, Japan led the launch of the Paris Agreement Article 6 Implementation Partnership at COP27 with the participation of over 60 countries and organizations (64 countries and 27 organizations as of March 23, 2023). We expect that opportunities to utilize the JCM will expand worldwide. We will further enhance international cooperation by increasing the number of participating countries and organizations.

Through these efforts, Japan will also contribute to the realization of the Asia Zero Emission Community, which aims for decarbonization and economic growth, and support the realization of the greatest and earliest possible reductions to limit the temperature rise to 1.5 °C.



Mr. Akihiro Nishimura, the then Minister of the Environment, participating in the launch of the Paris Agreement Article 6 Implementation Partnership

Source: Ministry of the Environment

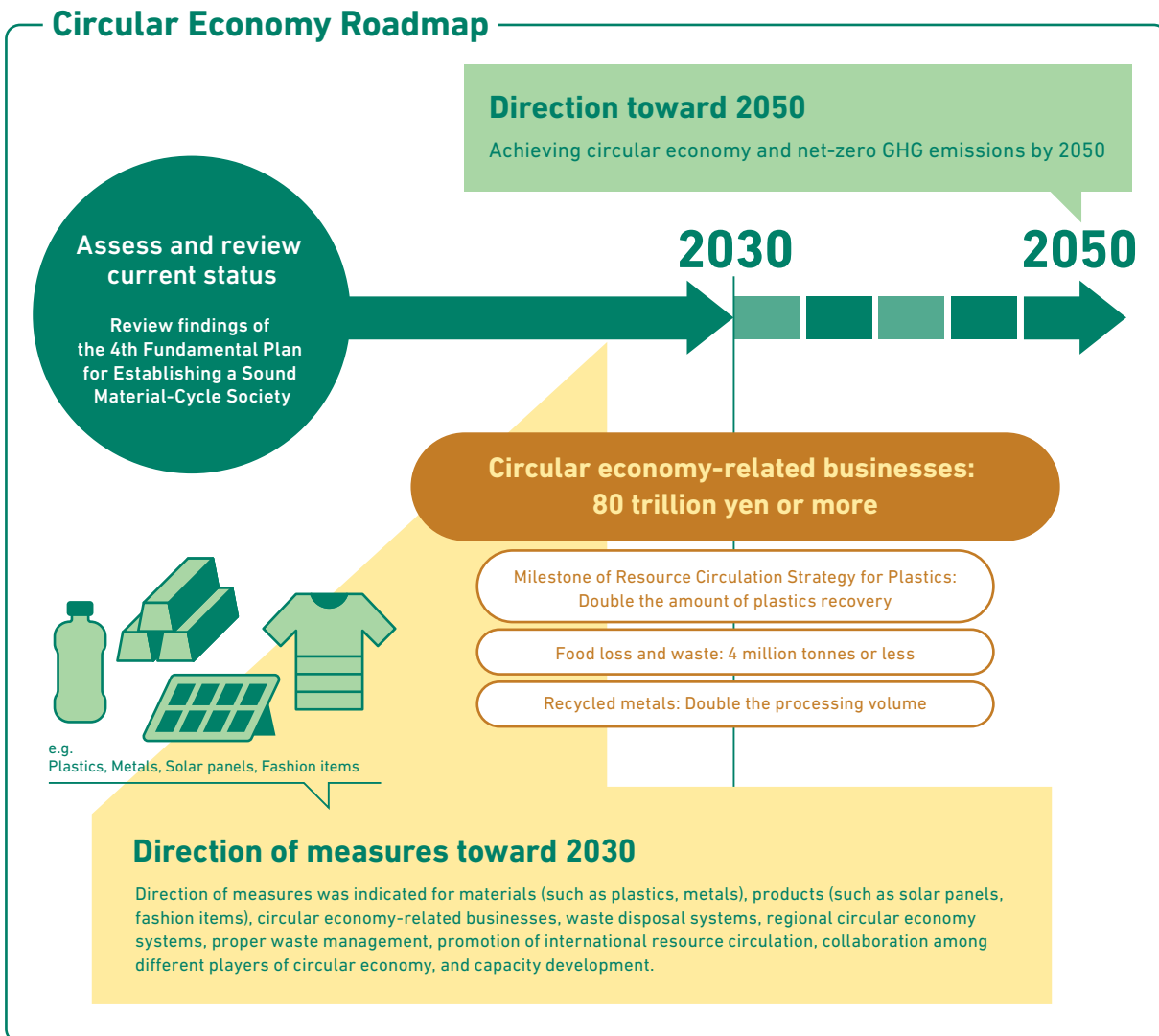
3 CIRCULAR ECONOMY

The second progress review of the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society and formulation of the Circular Economy Roadmap

Based on the results of the second progress review of the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society (approved by the Cabinet in June 2018), the Ministry of the Environment formulated and announced the Circular Economy Roadmap in September 2022, which set the direction toward circular economy for the first time in Japan after the declaration of net-zero GHG emissions by 2050.

The Circular Economy Roadmap sheds light on the direction of the circular economy that should be pursued with a view toward 2050, as well as the directions for measures to be taken toward 2030 in the materials, products, and other fields. Based on this, the public and private sectors will work together to promote decarbonization based on resource circulation throughout the lifecycle.

Overview of the Circular Economy Roadmap



Source: Ministry of the Environment

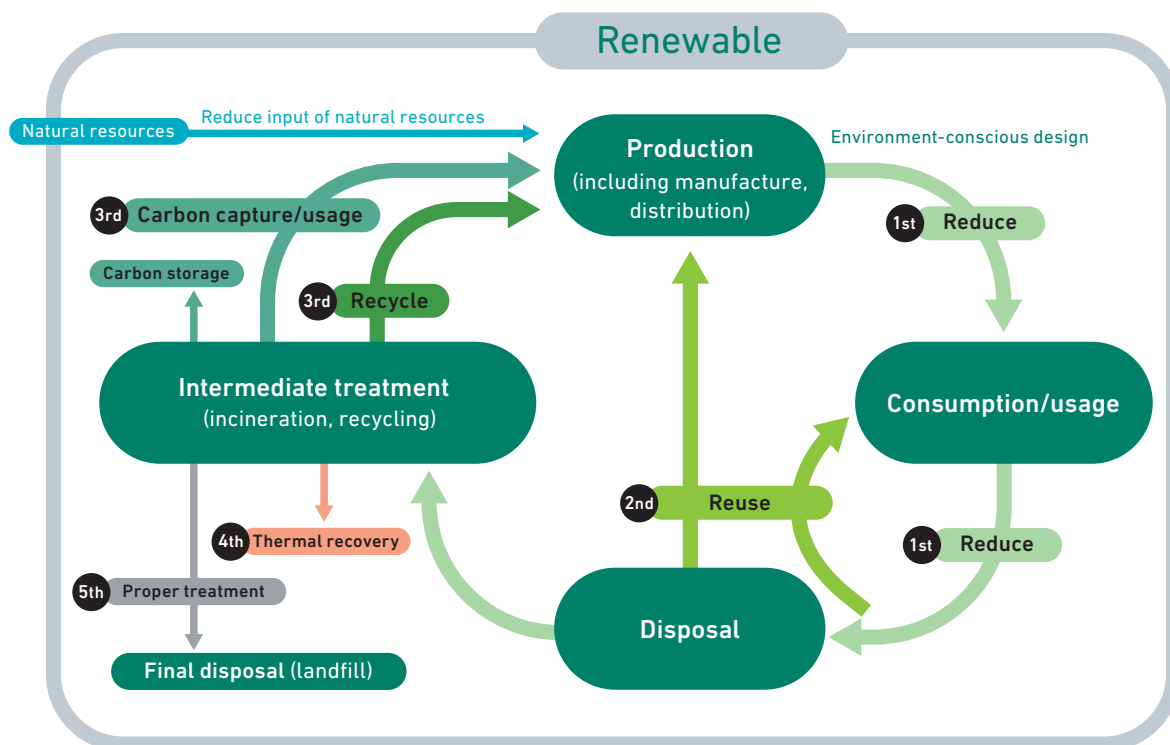
The direction of the circular economy that should be pursued with a view toward 2050

An analysis of Japan's Greenhouse Gas Inventory estimated that approximately 36% of the total emissions correspond to sectors where resource circulation can contribute. The 3Rs + Renewable and other efforts for the transition to the circular economy need to be promoted, especially in the context of achieving net-zero GHG emissions by 2050.

3Rs + Renewable is a policy approach to ensure the widespread practice of the 3Rs and encourage replacement by renewable resources. It is based on the fundamental principles stipulated in the Basic

Act on Establishing a Sound Material-Cycle Society (Act No. 110 of 2000). It not only calls for GHG emission reduction by minimizing incineration and landfilling of carbon-containing substances, but also reducing energy consumption in production processes, increasing use of biomass as feedstock and other material switch-over, and a shift to renewable energy in the processing/treatment steps. 3Rs + Renewable is a foundational approach that will contribute broadly to the realization of a decarbonized society.

Schematic chart of 3Rs + Renewable



Source: Ministry of the Environment

Promotion of plastics resource circulation

The Act on Promotion of Resource Circulation for Plastics (Act No. 60 of 2021), which came into effect in April 2022, provides measures for all parties concerned with promoting plastic resource

circulation based on the 3Rs + Renewable approach over the entire life cycle of plastic-containing products from design to waste disposal.

Revision of the Basic Policy on Waste Management and Formulation of Waste Management Facilities Improvement Plan

In June 2023, we revised the basic policy on waste management to reflect the changing situation surrounding waste management, such as the promotion of decarbonization in waste management toward net-zero GHG emissions by 2050 and intensive resource circulation throughout the life cycle.

In addition, we formulated the Waste Management Facilities Improvement Plan, setting forth the objectives and outlines regarding the implementation of waste management facility improvement projects for the planning period from FY 2023 through FY 2027,

pursuant to the provisions of the Act on Waste Management and Public Cleansing. It was approved by the Cabinet in June 2023. The new plan incorporates enhanced climate change countermeasures from the perspective of decarbonization toward net-zero GHG emissions by 2050. It also provides for further sophistication of recycling, construction of regional circulation systems, supply of renewable materials and other measures from the perspective of promoting the 3Rs, and strengthening resource circulation toward the realization of a sound material-cycle society.

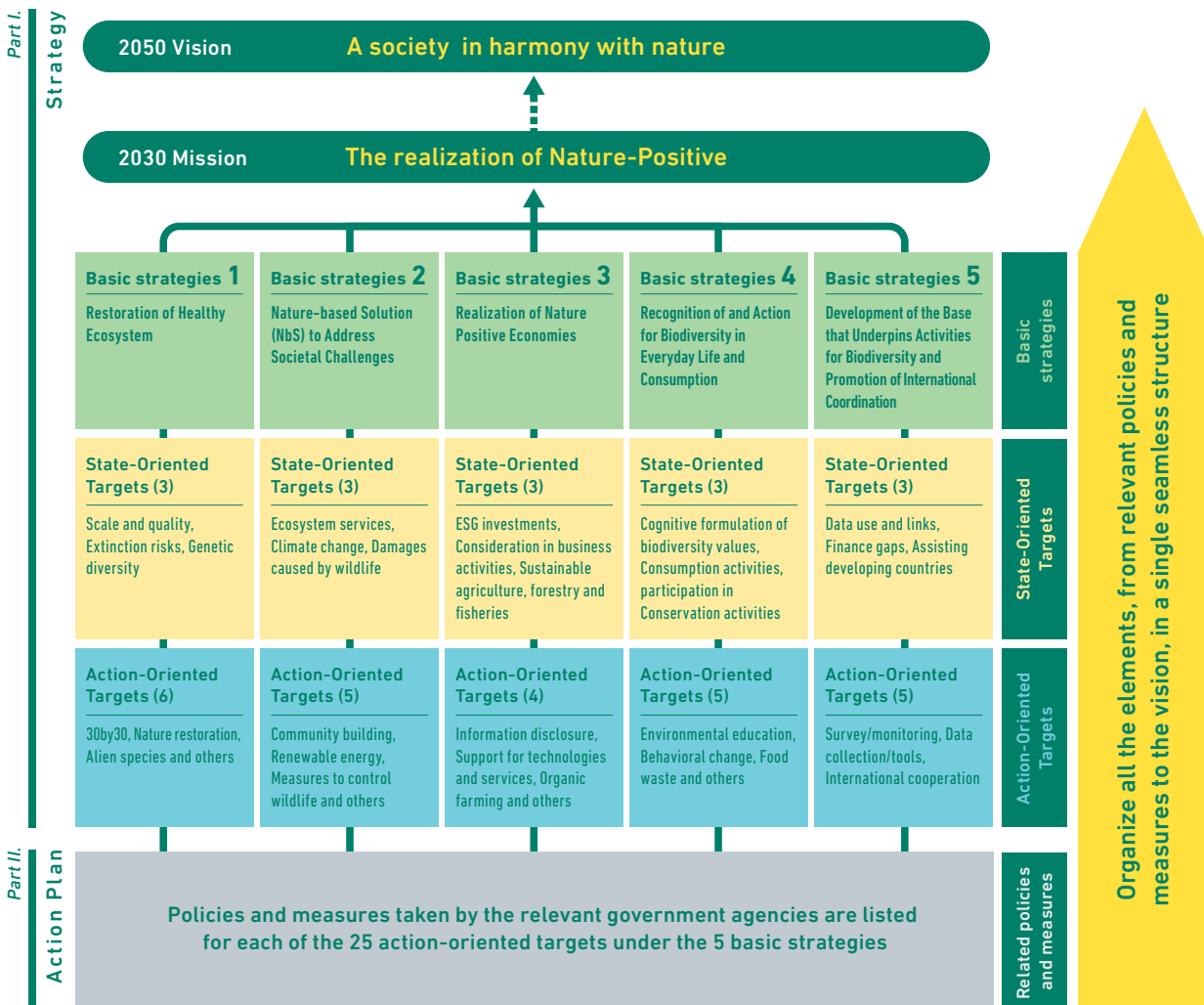
4 NATURE-POSITIVE

Five Basic Strategies for Nature-Positive in 2030

With the adoption of the Kunming-Montreal Global Biodiversity Framework (“KMGBF”) at the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP15) in December 2022 the National Biodiversity Strategy and Action Plan of Japan 2023-2030 (“new NBSAP”) was approved by cabinet in March 2023. Japan’s new NBSAP is aligned with the new framework to achieve nature-positive by 2030. It sets out five basic strategies designed to promote integrated efforts for the “twin environmental crises”,

biodiversity loss and climate change, sustain healthy ecosystems, and maintain and restore the blessings of nature through further efforts, such as achieving the 30by30 target, and promoting socio-economic activities that conserve and use natural capital sustainably. For each basic strategy, the ideal state (State-Oriented Targets) and actions to be taken (Action-Oriented Targets) have been determined. These targets also correspond to the four global goals and 23 global targets of the KMGBF.

Structure of the National Biodiversity Strategy and Action Plan of Japan 2023–2030



Source: Ministry of the Environment

Promotion of countermeasures against invasive alien species

Through the May 2022 enactment of the Act for Partial Amendment of the Act on the Prevention of Adverse Ecological Impacts Caused by Designated Invasive Alien Species (Act No. 42 of 2022) (“Revised Invasive Alien Species Act”), we have strengthened the management regime by stepping up measures against fire ants and other invasive alien species

unintentionally introduced to Japan, improving regulatory tools for invasive species such as red swamp crayfish that had not been regulated and are widely bred, and clarifying the sharing of management responsibilities with local governments and other parties concerned.

Column

Preventing the release of red swamp crayfish and red-eared slider turtle —Raising public awareness

The Revised Invasive Alien Species Act has opened the way for designation of designated invasive alien species with conditions (designation with exemption of certain regulatory provisions). Accordingly, red swamp crayfish and red-eared slider turtles have been designated as designated invasive alien species with conditions in June 2023. This designation prohibits the release of these two species while allowing the general public to continue keeping them at home. To prevent the release of these species into the open, it is important for the general public to not only deepen their understanding about the regulations themselves but also the serious adverse impacts that would be caused on aquatic ecosystems as well as the importance of keeping pets until the end (lifelong rearing).



Video calling for lifelong rearing of red-eared slider turtles



1st video



2nd video

Source: Ministry of the Environment

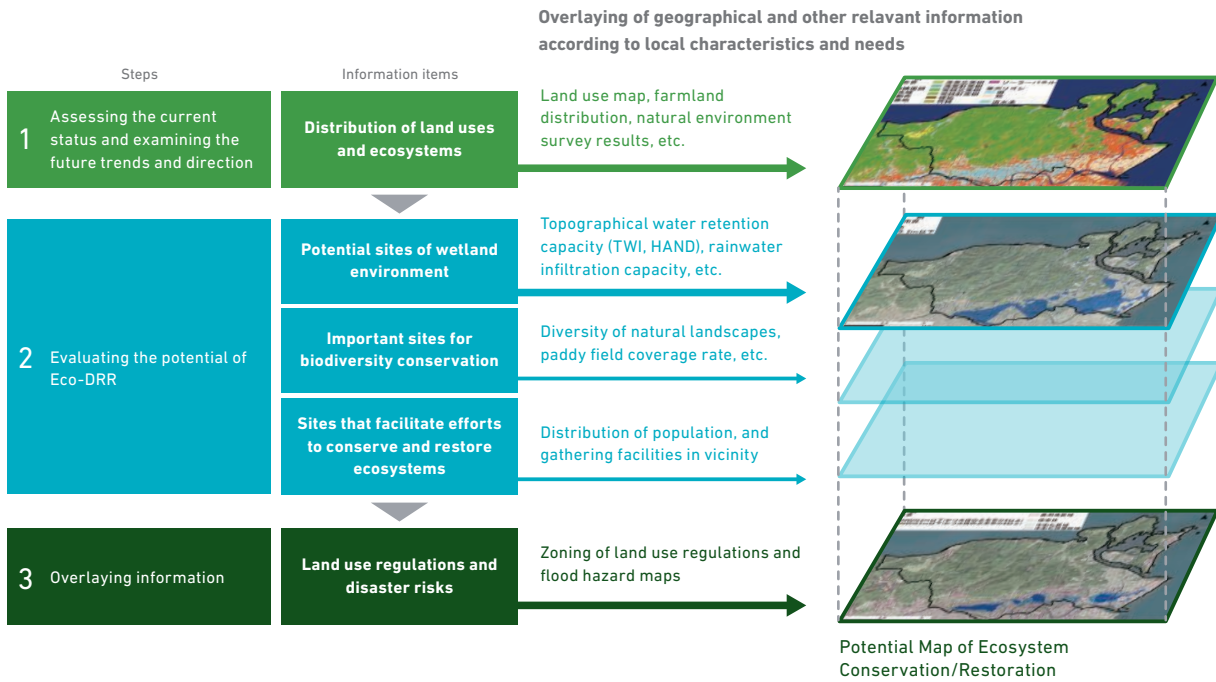
Nature-based Solutions

Nature-based Solutions (Nbs) are a relatively new inclusive concept, it includes Ecosystem-based Disaster Risk Reduction (Eco-DRR), such as mitigating flood damage by securing and strengthening the rainwater storage and infiltration functions of wetlands, and Ecosystem-based Adaptation (EbA), such as mitigating urban heat islands and reducing the risks of heat illness by creating forests and grasslands in urban areas. It has drawn attention as an approach to address multiple societal challenges, such as climate change, biodiversity loss, stagnation of socioeconomic systems, natural disasters, and food problems. It is also expected to have a positive ripple effect on

the healing power of nature and human health.

In March 2023, the Ministry of the Environment released a guidebook for the creation and use of the “Potential Map of Ecosystem Conservation/Restoration” to geographically identify and visualize areas that have the potential to implement Eco-DRR. The release was accompanied by a nationwide base map that will serve as a reference material. Through these initiatives, the Ministry promotes the development of disaster-resilient and nature-friendly communities by implementing green infrastructure and Eco-DRR.

Potential Map of Ecosystem Conservation/Restoration



Source: A Guide to Eco-DRR Practices for Sustainable Community Development

Towards Nature Positive Economies

The Ministry of the Environment has established the Nature Positive Economies Study Group to discuss challenges to realizing a nature positive economies, business opportunities arising from its realization, and the respective roles of different actors, among other actions.

In November 2021, the Japan Conference for the 2030 Global Biodiversity Framework (J-GBF) was inaugurated as the successor organization of Japan Committee for the United Nations Decade on Biodiversity. This Conference seeks to promote the participation and mutual cooperation of the government, local governments, businesses, citizens, NGOs, youth groups, and all other sectors of Japan, and encourage efforts for the conservation and

sustainable use of biodiversity, with a view to achieving the Post-2020 Framework for Biodiversity (now the KMGBF), which includes the 30by30 target, other international targets, as well as the new NBSAP and other domestic strategies.



The First Meeting of TNFD Consultation Group of Japan (kickoff event)

Source: MS&AD Insurance Holdings

5 INTERNATIONAL TRENDS

Outcomes of the G7

In April 2023, the G7 Ministers' Meeting on Climate, Energy and Environment was held in Sapporo as Japan

had the G7 Presidency. The participants recognized that they are facing the unprecedented triple global

crisis of climate change, biodiversity loss and pollution, as well as energy crisis, food security challenges, economic disruptions, and health threats. They agreed to advance and promote green transformation globally, working together to realize the transformation of their

economies to reach net-zero GHG emissions, circular economy, and nature-positive in an integrated manner, while ensuring inclusive, socially, and environmentally sustainable economic growth and energy security.

The 27th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27)

Following the cover decision “Glasgow Climate Pact” and other outcomes of the COP26 in 2021, the COP27 was held in Sharm el-Sheikh, Egypt, in November 2022, directed more toward full “implementation” of the goals of the Paris Agreement in addition to rulemaking.

Representing Japan, Mr. Akihiro Nishimura, the then Minister of the Environment, participated in the conference and stated Japan’s determination at the high-level segment. He emphasized the importance of including mitigation, i.e. reduction of GHG emissions, in the cover decision of the COP27, and called on the Parties to adopt a “mitigation work program” to scale up ambition and implementation for emissions reduction in this decade. Furthermore, he announced “Assistance



Mr. Akihiro Nishimura, the then Minister of the Environment, stated Japan’s determination at the high-level segment

Source: Ministry of the Environment

Package by the Government of Japan for Averting, Minimizing and Addressing Loss and Damage,” to provide comprehensive assistance for losses and damages, as part of dissemination of Japan’s efforts for addressing climate change.

The road to the adoption of the Kunming-Montreal Global Biodiversity Framework

Part two of the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP15) held in Montreal, Canada, in December 2022 adopted the KMGBF as the successor to the Aichi Biodiversity Targets which had been the global framework for biodiversity up to 2020.

At CBD COP15 Part Two, discussions continued on several important agenda including benefit sharing concerning Digital Sequence Information (DSI) on genetic resources. Before dawn on the final day, the KMGBF, resource mobilization, DSI, and other key decisions were agreed upon as a package agreement. Prior to this adoption, Mr. Akihiro Nishimura, the then Minister of the Environment of Japan, attended the meeting as a representative of the Government of Japan. In his statement at the high-level segment and speeches at three side events, he announced Japan’s pledge of 117 billion yen for the support of biodiversity in developing countries

over the 2023–2025 period. He also introduced Japan’s efforts and position, including the launch of the second phase of the Japan Biodiversity Fund (JBF2) (a total of 17 million US dollars) and support for the 700 million yen for the program of Community Development and Knowledge Management for the Satoyama Initiative (COMDEKS) in cooperation with the Keidanren Committee on Nature Conservation.



Mr. Akihiro Nishimura, the then Minister of the Environment, delivered his statements at the high-level segment of CBD COP15

Source: Ministry of the Environment

6 FY 2030 TARGETS

For integrated realization of net-zero, circular economy, and co-existence with nature positive economies in an integrated manner

As Japan works toward reducing its greenhouse gas emissions to net-zero by 2050, it aims to reduce its greenhouse gas emissions by 46% in FY 2030 from its FY2013 levels, furthermore, it will continue strenuous efforts in its challenge to meet the lofty goal of cutting its emissions by 50%, and thus, the 10-year period leading up to 2030 is regarded as the “critical decade.” Japan has also set goals for 2030 for activities such as biodiversity conservation and resource recycling, which are closely related to climate change. Now is the time for government, businesses, and each and every citizen to confirm and share these goals for 2030, and to work toward achieving them by taking collective action that goes beyond the mere extension of what we have done so far.

Decarbonization

46 %
reduction

Reduce greenhouse gas emissions by 46% from FY 2013 levels, and continue strenuous efforts in its challenge to meet the lofty goal of cutting its emissions by 50%

Exemplary action

**Create at least 100
Decarbonization Leading
Areas**

Progress and specific actions in FY2022

**46 Decarbonization
Leading Areas certified**



Harmony with nature

30by30

Effectively conserve and manage at least 30% of terrestrial and inland water areas, and at least 30% of marine and coastal areas

Exemplary action



Expand protected areas such as national parks and improve quality of management

Certify at least 100 sites where biodiversity conservation is being promoted through private-sector initiatives and register them as OECM by the end of 2023

Progress and specific actions in FY2022

Follow-up findings announced for the Comprehensive Assessment of National and Quasi-national Parks

- Japan's 30by30 Roadmap announced
- 30by30 Alliance for Biodiversity launched 419 members (March 2023)
- Trial implementation of a scheme to certify sites where biodiversity conservation is being promoted through private-sector initiatives and to register them as OECM at 56 sites
- National Biodiversity Strategy and Action Plan of Japan 2023–2030, which includes the Japan's 30by30 Roadmap, approved by the national Cabinet

Resource recycling

At least **80** trillion yen

Aim for a market size of 80 trillion yen or more for businesses related to circular economy

Exemplary action

Double the amount of plastic resources collected
Double the amount of metal recycling raw materials processed

Halving food loss and waste



Progress and specific actions in FY2022

Promote recovery of plastic resources including plastic products, based on the Plastic Resource Circulation Act that was implemented in April 2022

Assist demonstration experiment and equipment introduction of CO₂-saving processes for recycling of plastic, metal, and renewable energy-related products

Estimated food loss and waste in FY2020 was approx. 5.22 million tons. (Target: 4.89 million tons, half of the level in 2000.) Promote food loss reduction through creation of Zero Food Loss and Waste Areas, etc.