

A MULTIFACETED APPROACH OF DECARBONIZATION, CIRCULAR ECONOMY, DECENTRALIZATION AND HARMONY WITH NATURE

As well as declaring its goal of reducing its greenhouse gas emissions to net-zero by 2050, Japan declared that 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%.

Taking on this challenge requires more than merely an extension of what has already been done thus far; it is necessary to provide further support for the efforts of all entities and implement lifestyle changes in order to bring about a transformation in the behavior of each citizen and society as a whole. Furthermore, by utilizing digital transformation (DX) and other initiatives, we will continue to work on the Sustainable Development Goals (SDGs) with a multifaceted approach of decarbonization, circular economy, and decentralization and harmony with nature, with the aim of creating a green society in which we and future generations can live with peace of mind.

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1 FY 2030 TARGETS

Changing our Local Communities and Lifestyles for the Realization of a Green Society

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.

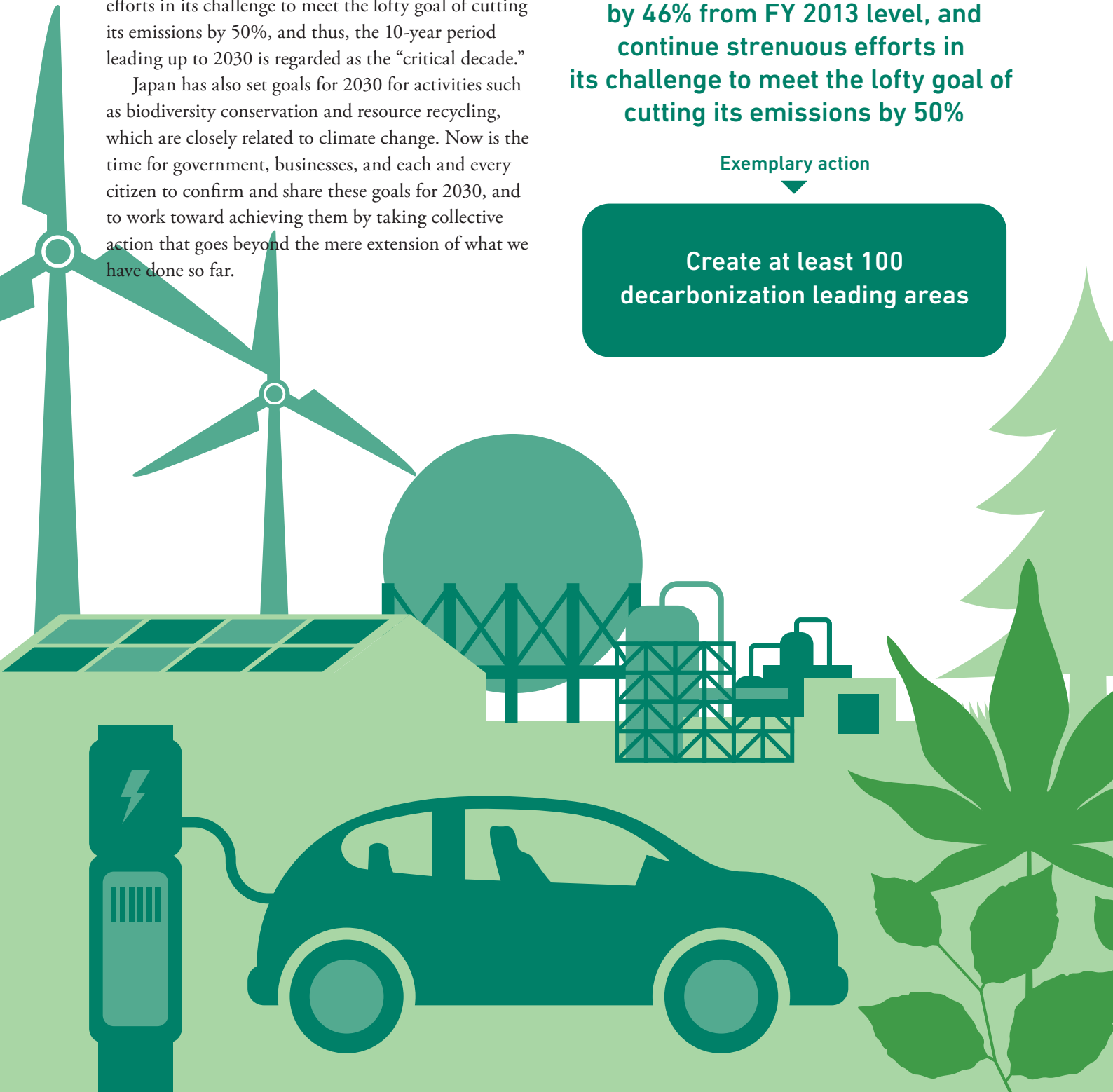
Decarbonization

46 %
reduction

Reduce greenhouse gas emissions by 46% from FY 2013 level, 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



Harmony with nature

30 by 30

Conserve at least 30%
of land and sea

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 by the end of 2023

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

Halve the amount of food loss
and waste compared to FY 2000

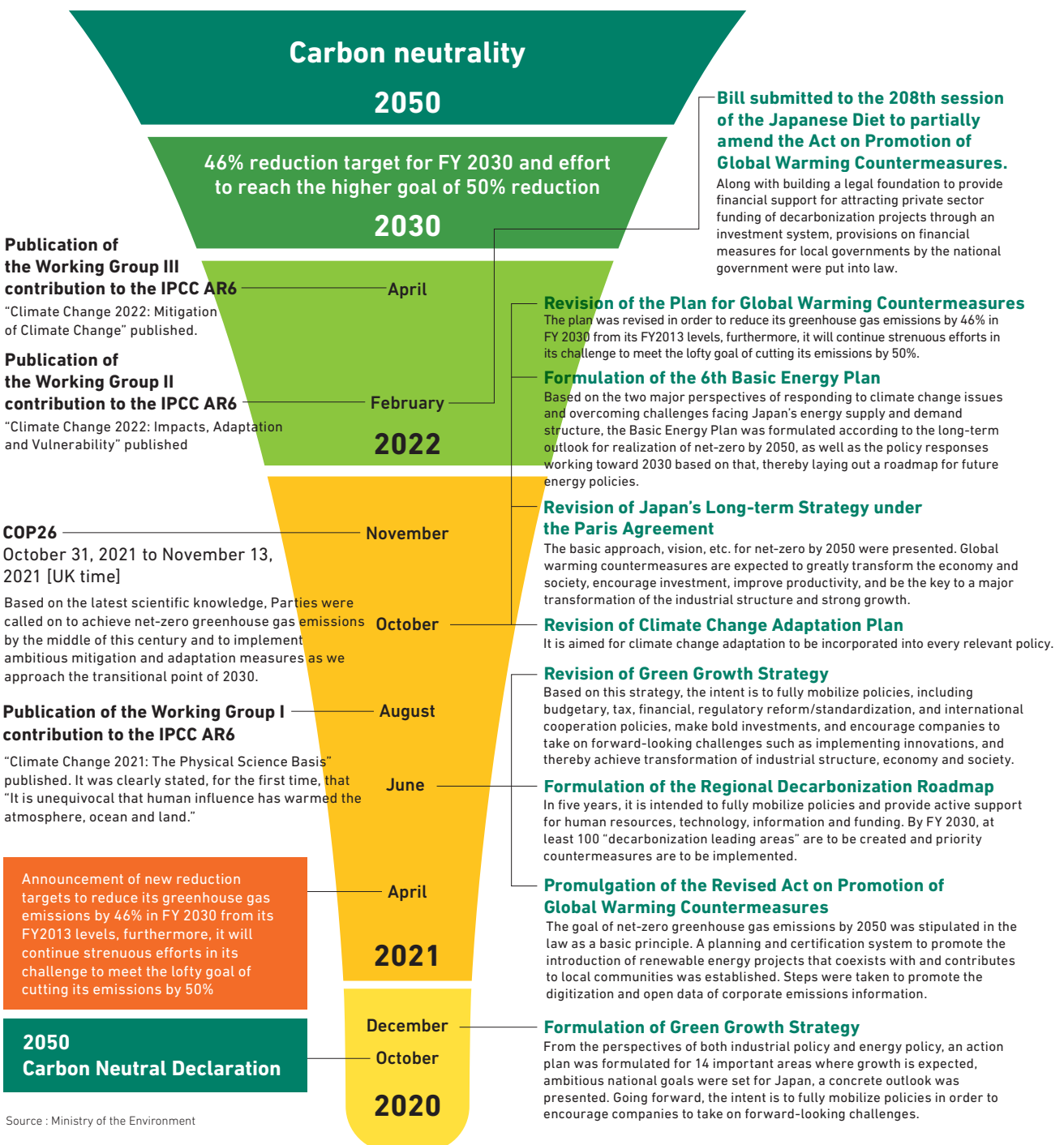


2 APPROACH FROM THE PERSPECTIVE OF DECARBONIZATION

Acceleration of Policies

Japan has already taken various measures toward decarbonization. In light of the recent major movement toward net-zero greenhouse gas emissions around the world, Japan has now declared that it will aim to reduce greenhouse gas emissions to net-zero by 2050 and has raised its goal for reducing greenhouse gas emissions by 2030. In order to realize these goals, further acceleration of measures is essential. Japan has been accelerating its efforts. In FY2021, Japan amended the Act on Promotion of Global Warming Countermeasures (Act No. 117 of 1998) and formulated Regional Decarbonization Roadmap.

Alteration of laws, strategies, plans, etc. related to climate change and decarbonization

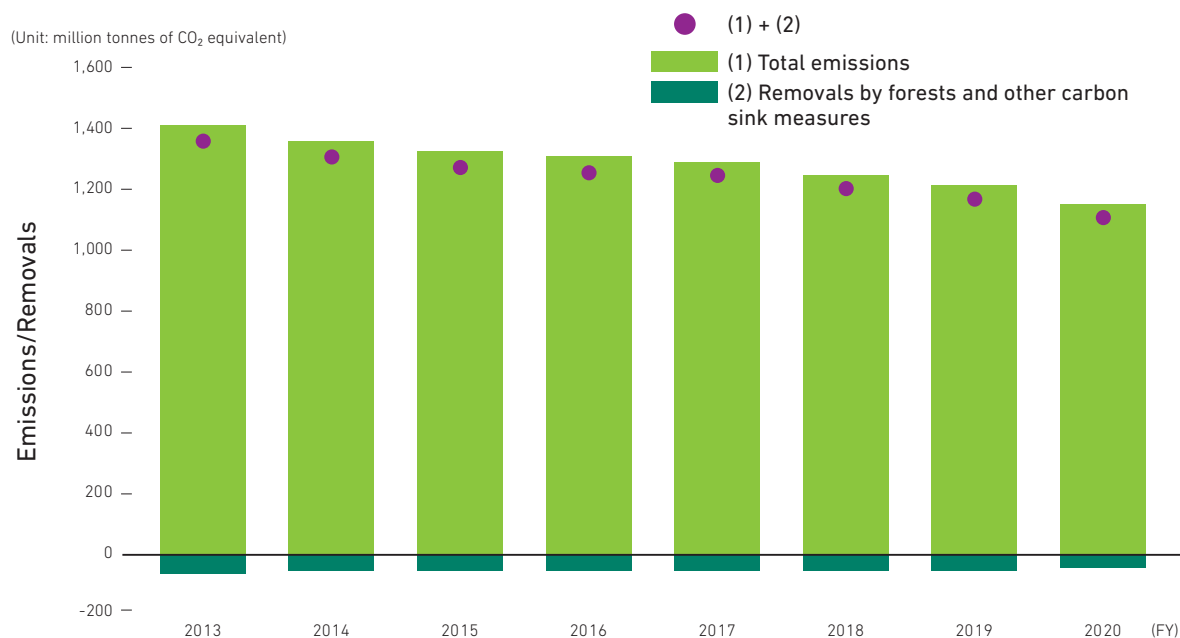


Source : Ministry of the Environment

Japan's greenhouse gas emissions

Japan's total greenhouse gas emissions in FY 2020 (final figures) were 1,150 million tonnes of carbon dioxide equivalent (Mt CO₂ eq.), and the amount has been decreasing for seven consecutive years since FY 2014. Factors behind this include a decrease in energy consumption (energy efficiency, etc.) and a shift to low-carbon electricity (expansion of renewable energy, restarting of nuclear power plants), etc. Moreover, compared to the total emissions of the previous fiscal year (1,212 Mt CO₂ eq.), the amount decreased by 5.1% (62 Mt CO₂ eq.), and a possible reason for this is the decrease in energy consumption due to the COVID-19 pandemic. The amount of CO₂ absorbed by forests and other carbon sinks in FY 2020 was approximately 44.5 Mt CO₂ eq. Excluding this amount, the amount of CO₂ emissions was 1,106 Mt CO₂ eq., which is a 21.5% reduction compared to the total emissions for FY 2013 (1,409 Mt CO₂ eq.).

Japan's greenhouse gas emissions, which have been declining for 7 years straight



Source: Ministry of the Environment

Simultaneous realization of renewable energy as a main power source and decarbonization of transportation

Because electric vehicles (EVs) and fuel cell vehicles (FCVs) [1] can simultaneously achieve decarbonization of the transportation sector and establishment of renewable energy as a main power source while acting as mobile storage batteries, [2] have batteries that can be reused, and [3] can supply electricity in the event of a disaster and act as components of decentralized and self-reliant energy systems, these vehicles are a key to promoting decarbonization, circular economy, and decentralization in an integrated manner.

In addition, Japan is supporting the construction of a decarbonized regional transportation model designed to meet new lifestyles by utilizing EV sharing services, and providing support for building decentralized and self-reliant energy systems with the aim of simultaneously realizing renewable energy as a main power source and strengthening system resilience through the combination of local renewable energy and use of EVs as mobile storage batteries.

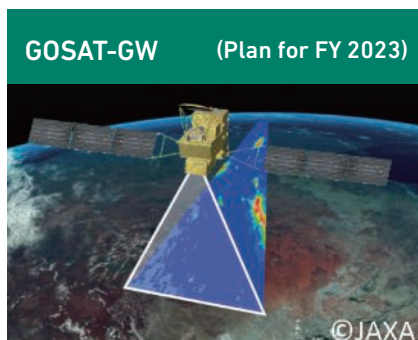
Promotion of green innovation

In order to promote green innovation, it is important to support startups that are making pioneering efforts in new environmental business (hereinafter referred to as “environmental startups”) and support the technological development of entrepreneurial candidates. Such support is expected to contribute to the creation of new environmental businesses in the post-COVID era and to an increase in employment. The Ministry of the Environment will continue to support the research, development, and commercialization activities of environmental startups for the creation of green innovation by providing support for specialized R&D for environmental startups, creating business opportunities through pitch events and awards, and granting credit based on performance verification of environmental technologies.

Examples

Green Innovation

Through observations by the Greenhouse gases Observing SATellite (GOSAT) series, the Ministry of the Environment has clarified the situation of global CO₂ and CH₄ concentrations increasing year by year. The successor model satellite GOSAT-GW, currently under development, will carry on and expand upon the mission of its predecessor, aiming to improve the ability to identify large-scale emission sources and the accuracy of emissions estimations.



From point observation to area observation

Source: JAXA, Ministry of the Environment



Electric vehicles utilizing GaN technology
(All GaN Vehicle)

Source: Ministry of the Environment

The AC/DC converters used for power conversion in home appliances, EVs, and power plants, etc. normally utilize silicon (Si) power devices; however, switching to gallium nitride (GaN) semiconductors can greatly reduce energy loss. In order to reduce CO₂ emissions, as well as accelerate digital society and strengthen the semiconductor supply chain, the Ministry of the Environment is carrying out development and demonstration of elements for the commercialization of ultra-energy-saving products that utilize GaN power devices from the manufacture of high-quality GaN substrates, and is also developing technology to achieve cost reduction.

The 26th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP26)

At COP26 held in Glasgow, UK from October to November 2021, a World Leaders Summit was held. This was the first summit-level meeting to be held at a COP session since COP21 in 2015, when the Paris Agreement was adopted. The Prime Minister of Japan, Mr. Fumio Kishida, attended the summit and delivered a speech.

The Prime Minister stated that the period up to 2030 as the “critical decade” and called on all parties to take ambitious climate change measures. He also announced Japan’s efforts in the area of climate change, including the new 2030 greenhouse gas reduction target, the preparation of up to 10 billion dollars in additional support for developing countries over the next five years, the commitment to doubling support for adaptation to climate change, and the promotion of green innovation.



Prime Minister Fumio Kishida delivering a speech at the COP26 World Leaders Summit

Source: Prime Minister’s official residence website

Towards expanded implementation of Article 6 of the Paris Agreement (Market Mechanism)

As Japan has implemented the Joint Crediting Mechanism (JCM) ahead of the rest of the world, the Ministry of the Environment will undertake three actions based on the conclusion of the Rulebook for Article 6 of the Paris Agreement.

The first of these is to expand JCM partner countries and strengthen project development and implementation in collaboration with international organizations such as the Asian Development Bank, the World Bank, and the United Nations Industrial Development Organization (UNIDO).

The second is to scale up the JCM by mobilizing further private finance.

The third is to contribute to the global operationalization of market mechanisms.

In relation to this, in February and March 2022, Japan hosted the “International Conference for Implementing Article 6 of the Paris Agreement” to promote understanding and capacity building for the implementation of the market mechanisms under Article 6 of the Paris Agreement. Tsuyoshi Yamaguchi, the then Minister of the Environment, participated online, and together with approximately 1,000 participants from more than 100 countries, engaged in discussions based on the sharing of experiences of the JCM and other



Tsuyoshi Yamaguchi, the then Minister of the Environment, giving opening remarks at the 1st International Conference for Implementing Article 6 of the Paris Agreement

Source: Ministry of the Environment

existing initiatives and advanced efforts related to the use of market mechanisms, in order to promote the development of specific institutional and governance frameworks and capacity building among government officials and related business sectors of each country. Based on the results of these discussions, Japan will offer support in the forms of capacity building for governments and business sectors in the Asian-Pacific region and training including Corresponding Adjustments for the Article 6 report.

3 APPROACH FROM THE PERSPECTIVE OF CIRCULAR ECONOMY

2nd inspection of the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society and formulation of a circular economy roadmap

As one of the initiatives for waste disposal among the measures to reduce greenhouse gas emissions in the “Plan for Global Warming Countermeasures,” it was decided to conduct a detailed investigation into the formulation of a roadmap for accelerating the transition to a circular economy. As part of the efforts in response to this, the evaluation and inspection results of the “4th Fundamental Plan for Establishing a Sound Material-Cycle Society” (approved by the Cabinet in June 2018) scheduled for FY 2022 will be compiled as a circular economy roadmap, with the aim of promoting decarbonization initiatives based on whole-life-cycle resource recycling.

Circular economy partnerships

In March 2021, the Ministry of the Environment, the Ministry of Economy, Trade and Industry, and Ippan Shadan Hojin Nippon Keizai Dantai Rengokai KEIDANREN (Japan Business Federation) launched the Circular Economy Partnership (Japan Partnership for Circular Economy, J4CE), a public-private partnership aimed at promoting circular economy initiatives. J4CE compiled 131 examples of advanced circular economy initiatives by Japanese companies and published them on its website in September. Additionally, J4CE has also published a collection of 28 case studies that are particularly noteworthy from various perspectives, including proven technologies and business models and R&D and collaborative efforts for the future.



Japan Partnership for Circular Economy and featured cases

Source: Ministry of the Environment, Ministry of Economy, Trade and Industry, Ippan Shadan Hojin Nippon Keizai Dantai Rengokai KEIDANREN (Japan Business Federation)

“Japan Partnership for Circular Economy (J4CE) Featured Cases”

The Act on Promotion of Resource Circulation for Plastics

The Act on Promotion of Resource Circulation for Plastics (Act No. 60 of 2021) was enacted at the 204th session of the Japanese Diet and came into effect on April 1, 2022. This law aims to promote plastic resource circulation by all entities in accordance with the principle of the 3R +Renewable throughout the life cycle, from product design to waste disposal of plastic products. Specifically, it includes the following measures.

- [1] At the “design and manufacturing” stage, formulating design guidelines for plastic products (e.g., reduction of plastic usage, reuse of parts, use of recycled plastic) and establishing scheme in which designs that comply with those guidelines are certified by the government.
- [2] At the “sales and supply” stage, establishing criteria regarding measures to be taken by suppliers of specified plastic products, and reducing plastic waste by rationally using of specified plastic products.
- [3] At the “discharge” stage, promoting efforts such as sorted collection and recycling by municipalities, voluntary collection and recycling by manufacturers, and waste reduction and recycling by waste generators.

Image design for the specially made website for “Plastic Resource Circulation”



Source: Ministry of Economy, Trade and Industry, Ministry of the Environment

Decarbonization in the waste and resource circulation sector

In the waste and resource circulation sector also, it is essential to expedite investigations into emission reduction measures to achieve net-zero greenhouse gas emissions by 2050. Therefore, in August 2021, the Committee on Sound Material-cycle Society of the Central Environment Council presented the “Medium- to long-term scenario for achieving net-zero greenhouse gas emissions in the waste and resource recycling sector by 2050 (draft).”

Going forward, while working to collaborate and coordinate with efforts toward decarbonization in other sectors such as the materials industry and manufacturing industry, and with consideration of the progress of technological development in waste treatment, the Committee will continue deepening and refining investigations into measures to reduce greenhouse gas emissions.

4 APPROACH FROM THE PERSPECTIVE OF DECENTRALIZATION AND HARMONY WITH NATURE

30by30 roadmap

At the G7 Cornwall Summit in June 2021, the “G7 2030 Nature Compact” was adopted, which states that G7 leaders commit to the global mission to halt and reverse biodiversity loss by 2030. This agreement stipulates that the G7 nations will lead by example, conserving or protecting at least 30% of their land and coastal and marine areas by 2030 (30by30), according to their national circumstances and approaches.

In Japan, about 20.5% of the land and 13.3% of the sea is currently designated as protected areas such as national parks. In order to meet the 30by30, establishing Other Effective area-based Conservation Measures (OECMs) is as important as expanding such protected areas. Hence in 2022, the Ministry of the Environment plans to trial a scheme in which the national government certifies sites where biodiversity conservation is being promoted through private-sector initiatives as OECMs. One of the quantitative indicators is to certify at least 100 sites by the end of 2023. To promote the further expansion of protected areas and establishment of OECMs in this way, the “30by30 Roadmap” was published in April 2022 as a roadmap for ensuring and restoring a healthy ecosystem which is fundamental for everyday life and socioeconomic prosperity.

Approaching global trends in biodiversity and the next National Biodiversity Strategy

International negotiations are currently underway with the aim of adopting the Post-2020 Global Biodiversity Framework, a set of new global biodiversity goals, at COP15 Part 2 scheduled to be held in Montreal, Canada in 2022. After the adoption of the Post-2020 Global Biodiversity Framework, in order to promote its prompt implementation in Japan, the National Biodiversity Strategy Subcommittee was established within the Committee on Natural Environment of the Central Environment Council from August 2021, ahead of the COP15, and the Subcommittee has begun consideration of the next National Biodiversity Strategy. The next National Biodiversity Strategy will be the domestic strategy and action plan for achieving the Post-2020 Global Biodiversity Framework. Its aim will be to realize a society in harmony with nature by 2050 and it will incorporate goals to be achieved and measures to be taken by 2030. The next National Biodiversity Strategy will focus on Nature-based Solutions (NbS) to various social issues, including countermeasures against climate change and the loss of biodiversity, which is an important global issue along with climate change, and will also present proposals for the mainstreaming of biodiversity in socioeconomic activities. In addition, the goals and indicators to promote the participation of various entities will be set, and the structure of the overall strategy will be reviewed.



Conceptual diagram of Nature-based Solutions (NbS)

Source: IUCN (2021). Global Standard for Nature-based Solutions.
A user-friendly framework for the verification, design and scaling up of NbS.
First edition. Gland, Switzerland: IUCN

Countermeasures against invasive species

In order to deal with the threat of alien species, based on the Act on the Prevention of Adverse Ecological Impacts Caused by Designated Invasive Alien Species (Act No. 78 of 2004; hereinafter referred to as the “Invasive Alien Species Act”), invasive alien species that may cause damage to Japan's ecosystems are designated as “designated invasive alien species,” and their import and raising are regulated. As more than five years have passed since the Revised Invasive Alien Species Act came into effect in 2014, in January 2022, the Central Environment Council issued a report on measures to be taken in the future based on the status of enforcement of the Invasive Alien Species Act. Based on this, in March 2022, the Cabinet decided the Bill for Partial Amendment of the Act on the Prevention of Adverse Ecological Impacts Caused by Designated Invasive Alien Species, and submitted it to the 208th session of the Japanese Diet. The reform bill covers various matters related



Red swamp crayfish
(alien species)

Source: Ministry of the Environment

to strengthening pest control systems, such as strengthening measures against alien species that are unintentionally introduced to Japan, such as fire ants, improving control methods for alien species that are not currently regulated but are widely bred, such as red swamp crayfish, and clarifying the sharing of pest-control roles with each entity, such as local governments. When implementing countermeasures against alien species, it is also important to respond to changes in the possible areas of their distribution due to climate change.

The virtuous cycle of protecting and utilizing national parks

There are 34 national parks that have been designated as representative of Japan's natural environments. Due to Japan's widely varied topography shaped by volcanic activity, the long north-south stretch of the land, and the wide variety of climatic zones, it is possible to observe diverse landscapes, flora and fauna, as well as experience the lifestyles and culture of people living in harmony with nature.

From 2021 onwards, as new developments of the Project to Fully Enjoy National Parks, the aim is for the realization and branding of high-quality tourism that allows visitors to fully enjoy nature, as well as the recovery of park use by domestic and overseas visitors to levels before the impact of the COVID-19 pandemic. To these ends, efforts are being expanded to all national parks, with work being carried out to achieve sustainable tourism by promoting various measures such as strengthening domestic tourism attraction, providing new utility value of national parks such as workcations, registering zero-carbon parks with the aim of promoting decarbonization initiatives in national parks, and decarbonization of park facilities. The achievements made thus far will be further extended and refined, leading to the revitalization of local economies and the conservation of the natural environment.

Furthermore, in 2021, the Natural Parks Act (Act No. 161 of 1957) was revised with the aim of expanding the outcome of the Project to Fully Enjoy National Parks nationwide. In this revision, in order to realize a “virtuous cycle of protection and utilization” by strengthening measures for park utilization in addition to environmental protection, and to also contribute to regional revitalization, the following main measures are implemented.

- [1] Establish a nature experience activity promotion planning system to promote high-quality nature experience activities that make use of local natural environments.
- [2] Establish a visitor facilities maintenance and improvement planning system to improve the quality of national parks and other visitor facilities.
- [3] Establish new regulations on feeding wild animals such as brown bears and increase penalties for violations in Special Zone.