The Government of Japan

Submission on the sixth Global Dialogues in 2025 under the Sharm el-Sheikh mitigation ambition and implementation work programme referred to in paragraph 10 of decision 2/CMA.6

August 2025

1. Introduction

Japan welcomes the opportunity to provide views on the focused topic of opportunities, best practices, actionable solutions, challenges, and barriers relevant to enable mitigation solutions in the waste sector, including through circular economy approaches, for the sixth global dialogue under the Sharm el-Sheikh mitigation ambition and implementation work programme (MWP) in line with paragraph 10 of decision 2/CMA.6.

The mitigation solutions in the waste sector, the topic of the sixth global dialogue, are one of the significantly important elements to be considered in realizing a decarbonized society. Japan believes that sharing experiences, lessons learned, and actionable solutions in relation to the reduction of GHG emissions from the waste sector, and how these kinds of information can be turned into actual mitigation action, would help accelerate global actions toward the achievement of the 1.5 degrees goal. Japan is ready to actively engage in discussion at the sixth global dialogue.

Japan believes the outcome of two dialogues should be reflected in the CMA decision. We understand that the fifth global dialogue in Panama in May 2025 has produced fruitful and comprehensive discussions related to the forest sector. Taking into account the objective of the MWP, which is to urgently scale up mitigation ambition and implementation in this critical decade, it is crucial to reflect the key findings from the global dialogues in the CMA decision and incorporate them into on-the-ground actions in each country.

2. Proposal of subtopics for the sixth global dialogue and IFE

Japan proposes the four subtopics (a) through (d) below and provides case studies for each subtopic.

(a) Policies and plans for the realization of a circular economy

In order to strengthen efforts to improve resource productivity and recycling rates toward the realization of a decarbonized and circular society, it is essential to promote the transition from a linear economy, which is characterized by mass production, mass consumption, and mass disposal, to a circular economy that efficiently and circularly utilizes resources in a sustainable manner. The transition to circular economy will contribute to addressing social issues such as climate change, biodiversity loss, and

environmental pollution, as well as strengthening industrial competitiveness, economic security, regional revitalization, and the realization of a high quality of life.

In Japan, it is estimated that efforts to promote resource circulation through 3Rs + Renewable (Reduce, Reuse, Recycle + Renewable Energy) will contribute to reducing GHG emissions from manufacturing, freight transport, industrial processes and product use, and waste sectors, which account for 36% of Japan's GHG emissions, as part of the transition to a circular economy. It can also contribute to reducing GHG emissions from the global food system, including food production, processing, and distribution, which are estimated to account for 21-37% of global anthropogenic GHG emissions according to the IPCC Special Report on Land Use, Land Use Change, and Forestry.

In order to promote such social renovation, it is essential to develop policy packages, action plans, and roadmaps for establishing a circular economy at the national, subnational, and local levels. It is also essential to implement a comprehensive progress management system to ensure the effective implementation of these policies and plans. Furthermore, to conduct objective and effective progress management, it is desirable to establish indicators to quantitatively assess the status of efforts toward a decarbonized and circular society, as well as indicators to evaluate the environmental contributions of resource circulation.

The following lists case studies of policies and plans that contribute to the realization of a circular economy. There are also events that efficiently promote and encourage resource circulation. For example, the International Horticultural Expo 2027, or "GREEN × EXPO 2027", which will be held in Yokohama, Japan in 2027, aims to promote a circular economy through "GREEN circular architecture" and contribute to the realization of a sustainable society by taking measures such as reducing food loss.

Case studies

- **Case (a)-1. Fundamental Plan for Establishing a Sound Material-Cycle Society**

Japan has positioned the transition to a circular economy as a national strategy and has set the following as key fields for achieving this. The government has outlined measures to be taken to achieve these and has set numerical targets for FY 2030.

1. Create sustainable communities and a sustainable society by transitioning to a circular economy with the aim of forming a sound material-cycle society
2. Thoroughly circulate resources throughout the entire lifecycles through resource circulation-oriented coordination between business operators
3. Build diverse regional circulation systems and revitalize regions
4. Improve the resilience of the platform for circulating resources and managing waste, steadily and appropriately dispose of waste and restore the environment
5. Build a proper global resource circulation system and promote the overseas

expansion of Japan's resource circulation industry

The numerical targets include the following 10 material flow indicators related to the overall picture of a circular society: (1) Resource productivity, (2) Per capita consumption of natural resources (material footprint), (3) Proportion of renewable and circulative resources used, (4) Cyclical use rate (resource base), (5) Cyclical use rate (waste base), (6) Final disposal amount, (7) Market size of business related to a Sound Material-Cycle society, (8) Public awareness and behavior regarding the formation of a circular society, (9) GHG emissions from sectors related to the transition to a circular economy and those from the waste sector, and (10) Ecological footprint excluding carbon footprint.

The progress of these material flow indicators is evaluated annually.

- **Case (a)-2. Act Concerning Sophistication of Recycling Business, etc. to Promote Resource Circulation**

There is a growing global movement toward the use of recycled materials, and it is necessary to strengthen the industrial competitiveness in resource circulation by ensuring the quality and quantity of recycled materials. In light of this situation, the Act Concerning Sophistication of Recycling Business, etc. to Promote Resource Circulation was enacted in May 2024 to make recycling business sophistication and promote the development of the resource circulation industry, ensuring that recycled materials of the quality and quantity required by manufacturers are reliably supplied.

This act promotes resource circulation efforts such as decarbonization and securing quality and quantity of recycled resources in an integrated manner by (a) establishing the basic policy to prescribe a national direction about sophistication on the efforts for resource circulation, (b) reporting and publicizing the status of implementation of recycling by industrial waste disposers with particularly large disposal volumes, and (c) establishing an accreditation system related to sophistication of recycling business, etc.

- **Case (a)-3. Act on the Promotion of Effective Utilization of Resources**

As part of Japan's GX (Green Transformation) strategy aimed at achieving both carbon neutrality by 2050 and sustained economic growth, the Act on the Promotion of Effective Utilization of Resources was amended in May 2025. The objective of the amendment is to strengthen resource circulation and promote emissions reduction throughout the entire product life cycle. The main elements of the revised framework are as follows:

1. Introduction of a requirement for businesses to utilize recycled resources

   The Act is to stipulate a measure that will designate products in which businesses are required to utilize recycled resources and require manufacturers whose production amount is above a certain level to submit a plan and regularly report on their utilization of recycled materials.

2. Promotion of environmentally friendly designs

The Act is to establish a certification system for outstanding, environmentally friendly designs, including designs that facilitate the disassembly and sorting of products and designs that lead to longer product life, from the perspective of promoting the effective utilization of resources and decarbonization.

3. Promotion of further recycling of raw materials that are necessary for achieving GX

The Act is to take a special measure under the Act on Waste Management and Public Cleaning, in which businesses that have received certification for their high collection targets are not required to obtain a license for collecting and recycling designated products if they observe appropriate management practices.

4. Promotion of Circular Economy Commerce

The Act is to newly establish categories of businesses engaging in Circular Economy Commerce, including sharing, and to set standards that such businesses should meet from the perspective of the effective utilization of resources.

- **Case (a)-4. Mid- to long-term scenarios for achieving net-zero GHG emissions by 2050 in the waste and resource recycling sector**

To achieve net-zero emissions in the waste and resource circulation sector by 2050, this document was issued in August 2021, outlining the basic principles for determining the scope of GHG emissions to be targeted and implementing measures to reduce GHG emissions. It also clarifies the directions that various stakeholders, including the central government, local governments, private companies, civil societies, and citizens, should pursue in the future. This document is being developed as a mid- to long-term scenario for achieving net-zero emissions in the waste and resource circulation sector by 2050.

This mid- to long-term scenario estimates GHG emissions in the waste and resource circulation sector by 2050 under seven scenarios that vary in the level of implementation of various measures.

(b) Effective emission reduction technologies related to waste management

To implement policies and plans aimed at achieving a circular economy, and to realistically reduce GHG emissions, it is necessary to appropriately and swiftly introduce effective GHG reduction technologies. Based on the IPCC Guidelines' category classification, GHG emissions from the waste sector are categorized into four categories: (1) Solid waste disposal, (2) Biological treatment of solid waste, (3) Incineration and open burning of waste, and (4) Wastewater treatment and discharge. At the sixth global dialogue, it is desirable to share GHG emission reduction technologies that could serve as best practices in each of these categories and discuss strategies for their widespread implementation.

This submission introduces case studies of waste-to-energy and semi-aerobic landfill methods (Fukuoka method).

Case studies

- **Case (b)-1. Waste to Energy**

Waste-to-energy (WtE) technology is a technology that utilizes the heat generated during the incineration of waste to generate energy. WtE technology contributes to significant reduction of the amount of waste, and plastic pollution. The technology has advantages of promoting environmentally sound waste management, including contribution to improving sanitation, and addressing landfill site shortage, which are serious issues of large cities in Asia.

WtE also reduces methane emissions from landfill sites and GHG emissions by replacing grid electricity. Furthermore, Japan has been developing a cutting-edge WtE technology with CCU, which captures and separates CO2 emitted by incineration, and utilizes it for agricultural usage including vegetables and fruits, and algal culture.

WtE technology also attracts private investments with public support including the Joint Crediting Mechanism (JCM) in line with the rules of Article 6 of the Paris Agreement. For example, the Waste-to-Energy Project in Bac Ninh Province, Vietnam implemented by the joint venture of Japanese and Vietnamese companies, which is now at the operational stage, is expected to reduce over 40 thousand tons of CO2 per year. The plant generates electricity from the total of 500 tons/day of waste; 230 tons/day of municipal solid waste, which were previously disposed of as landfill, 120 tons/day of municipal solid waste and 150 tons/day of industrial solid waste, which were previously incinerated without generating electricity.

- **Case (b)-2. Semi-aerobic landfill structure (Fukuoka method)**

The semi-aerobic landfill structure (Fukuoka method) is an innovative technology for final disposal sites, which was developed in Japan. It is mainly composed of a gas ventilation, leachate collection and discharge system.

Pebbles and leachate collection pipes are laid at the bottom of the landfill to drain away leachate, preventing it from accumulating in the landfill layer. In this landfill structure, the leachate is properly discharged through the collection pipes, preventing contamination of soil and groundwater around the landfill site.

Besides, thermal convection occurs due to fermentation heat generated by decomposition of waste. Air is naturally supplied from the leachate collection/discharge pipes to the inside of landfill, which promotes decomposition of waste while maintaining an aerobic condition. The oxygen helps to decompose waste materials by aerobic bacteria and decreases the generation of methane in the anaerobic reaction. It does not require special air blasting facility, making construction, operation and maintenance easier.

The Government of Japan has supported the implementation of the technology overseas actively, in particular in Asia and Africa, with the Japan International Cooperation Agency (JICA), United Nations Human Settlements Programme (UN-Habitat), and United Nations Industrial Development Organization (UNIDO). Since the first Fukuoka Method landfill site outside Japan was constructed in Malaysia in 1991, the technology has been introduced in more than 20 countries worldwide. In 2025, the governments of Japan and

Tunisia agreed to implement the Fukuoka Method as the first project under the JCM. This demonstrates that the Fukuoka Method is a synergistic technology that contributes to both sound management of waste and climate change action.

For more details:

https://www.city.fukuoka.lg.jp/kankyo/k-seisaku/etc/documents/Fukuoka_method.pdf

(c) The importance of circular economy in the industrial sector

In the IPCC Sixth Assessment Report WGIII, the circular economy is positioned as one of the key mitigation strategies in the industrial sector. However, numerous technical challenges remain in its practical implementation. This section introduces Japan's technology development efforts aimed at overcoming this challenge and promoting circular economy in the industrial sector.

Case study

- **Case (c). Recovery and Refining Technologies for Critical Minerals from Black Mass Generated in Lithium-Ion Battery Recycling**

Under the financial support of the Ministry of Economy, Trade and Industry (METI), Japanese material manufacturers are conducting pilot demonstration projects to recover and refine nickel, cobalt, and lithium from black mass generated during the recycling of lithium-ion batteries (LIBs).

These projects aim to commercialize a process capable of producing battery-grade materials from black mass, thereby contributing to the establishment of a circular system for critical mineral resources.

Moreover, these critical minerals are essential components of decarbonization technologies, such as batteries for electric vehicles. However, the expected growth in future demand raises concerns about the stability of their supply in the world. From the perspective of ensuring a stable supply of critical minerals necessary for the production of decarbonization technologies, recycling technologies play an increasingly vital role.

(d) Collaboration with stakeholders to accelerate climate action related to waste management

Waste management and resource recycling initiatives cannot be advanced by a single actor alone. It is essential that all stakeholders, including national and local governments, businesses, and citizens, work together in a strong partnership.

Even with laws, regulations, action plans, technologies, and businesses in place, the effectiveness of these measures is enhanced through the organic collaboration and cooperation of stakeholders. Sharing and expanding best practices in waste management

and resource circulation that have been accumulated through stakeholder collaboration in various countries is likely to be valuable.

Here, Japan presents examples of initiatives where multiple stakeholders have collaborated.

Case studies

- Case (d)-1. Food loss and waste reduction

Japan had national targets to reduce food loss and waste by half by FY2030 for both household and business,the latter of which was revised in March 2025 to by 60% as it had achieved the target as of 2022. The legal frameworks including the Food Recycling Act and the Act on the Promotion of Food Loss and Waste Reduction underpins all efforts by various stakeholders to achieve the targets in a cooperative manner.

There are a series of government initiatives to encourage the stakeholders to address food loss and waste issues.

For example, the "Model Project for Creating Zero Food Loss and Waste Areas" supports pioneering efforts to create "Zero Food Loss and Waste Areas" that aim for zero incineration and zero landfill)by reducing food loss and waste and expanding food recycling activities and disseminates the results widely to other regions and organizations. "Zero Food Loss and Waste Areas" are envisioned at various levels, from individual commercial establishments to small communities and multiple stores of restaurant chains.

The Government is also promoting "mottECO," an initiative to invite people to consider taking out leftover food at restaurants, while taking home uneaten food from restaurants is not popular in Japan. Local governments and food businesses establish the "mottECO Promotion Consortium" in 2021, with the assistance of Ministry of the Environment.. The Consortium is expanding every year with more than 1,500 members as of April 2025 and is disseminating activities for reducing food loss and waste.

Case (d)-2. Recycling of used disposable diapers

In Japan, the aging population is expected to lead to an increase in the use of disposable diapers, with their share of municipal waste projected to rise from 5.3 –5.7 % in 2022 to approximately 6.6–7.1% by 2030.

The Ministry of the Environment works with local governments and companies to expand efforts to recycle used disposable diapers. In particular, the ministry supports information sharing with local governments and matches local governments with collection and transportation services as well as disposable diaper manufacturers and recycling operators to facilitate the expansion of recycling initiatives and the self-sustaining implementation of such initiatives by local governments. Through these efforts, the ministry aims to expand the total number of local governments that have implemented or are considering recycling initiatives for used disposable diapers to 150 by FY 2030.

Used disposable diapers can be recycled by separating them into pulp and superabsorbent

polymers (SAP), enabling them to be used in the production of new disposable diapers. This reduces the use of virgin resources in disposable diaper manufacturing, reduces CO2 emissions from incineration, and thus facilitates the achievement of both circular economy and climate change mitigation.