



Japan's Policy related to Plastic Resource Circulation

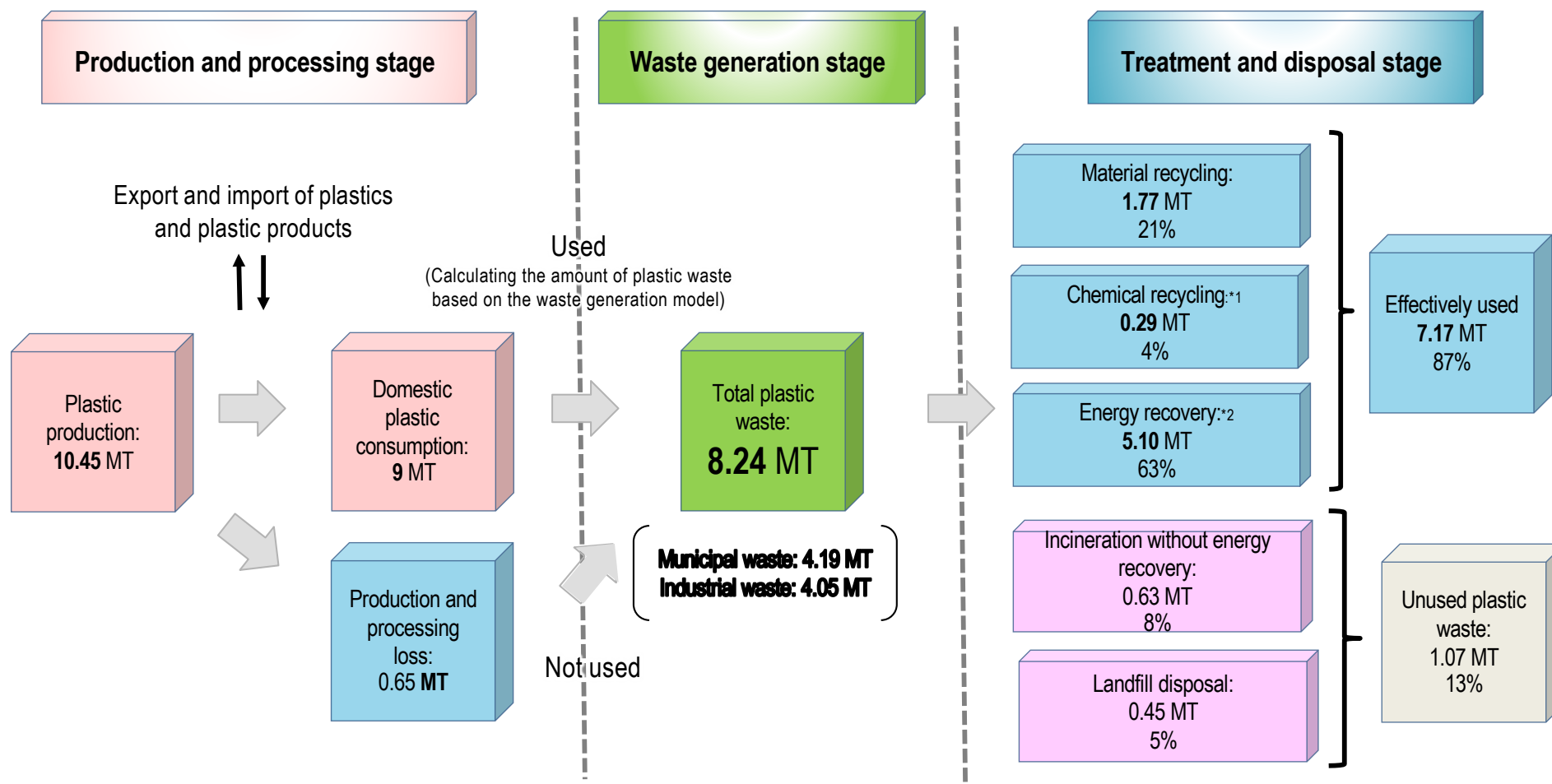
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1. Japan's situation regarding plastics

Material Flow of Plastics in Japan (in 2021)

Source: Plastic Waste Management Institute



*1. Chemical recycling: blast furnace feed, coke oven feed, gasification, etc.

*2. Energy recovery: solid fuels, cement materials and fuels and waste-to-energy power generation

Japan generates approx. 8 million tons of plastic waste (in 2021)

⇒ **87% of plastic waste is effectively used** (25% recycled and 63% used for energy recovery)
13% of plastic waste is not used (landfilled or incinerated)

Emerging problem of marine plastic pollution

- Every year, **around 8 million tons** of plastic waste are discharged to the ocean worldwide, causing negative impacts on ecosystems, tourism, and fisheries.
- **Microplastics with a diameter of less than 5mm** drift around the world, raising concerns about affecting marine ecosystems and human health.

Allegedly, most plastic waste is discharged from emerging and developing countries;
therefore, it is important to take worldwide measures involving these countries.



Photo courtesy by Tsushima City



Osaka Blue Ocean Vision

G20 Osaka Summit in June 2019

“This vision aims to reduce additional pollution by marine plastic litter to zero by 2050”

- This vision was **shared as a common global vision** by G20 leaders
- G20 leaders also called for other countries and international organizations to join the vision (**87 countries and regions** have joined the vision as of May 2023)



G7 Sapporo Ministers' Meeting on Climate, Energy and Environment (Apr 2023) and G7 Hiroshima Summit (May 2023)

- G7 target on plastic pollution:
“We are committed to **end plastic pollution, with the ambition to reduce additional plastic pollution to zero by 2040**”

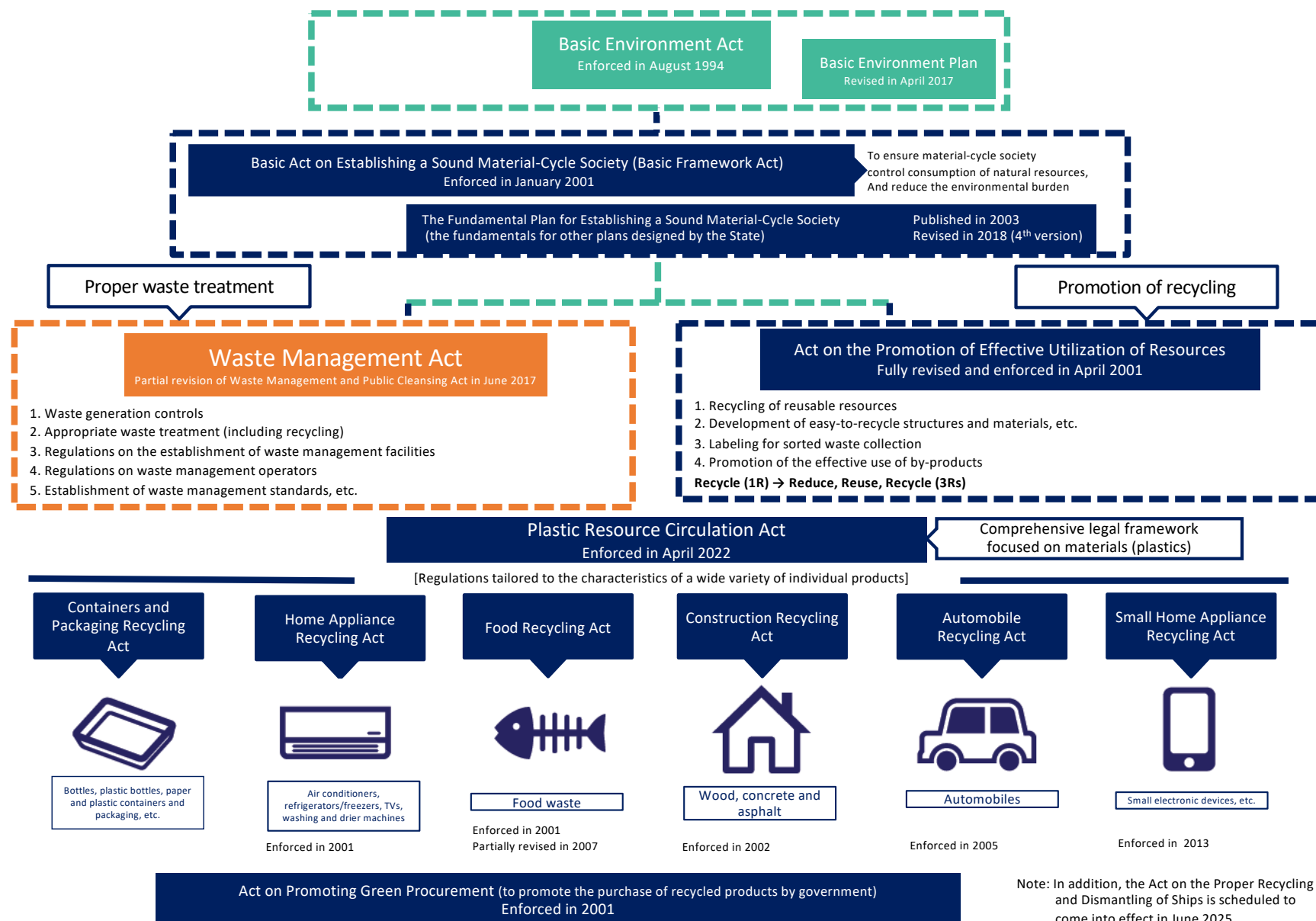
Plastic waste import controls in developing countries

- In 2017, **China banned the import of plastic waste to prevent environmental pollution in the country.**
- Subsequently, Southeast Asian countries took over China as the major plastic export destinations of Japan but **also banned the import of plastic waste.**
- An amendment was made to the Annex of the **Basel Convention** on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal to **add plastic waste to the list of wastes subject to controls under the Convention** at COP14 (enforced in Jan 2021).

Legal System for Establishing a Sound Material-Cycle Society and Circular Economy



- Under the Basic Act on Establishing a Sound Material-Cycle Society, which serves as a basic framework for the formation of a sound material-cycle society, the Waste Management Act and Recycling Acts targeting various products have been systematically established to promote appropriate waste treatment and resource circulation.



Note: In addition, the Act on the Proper Recycling and Dismantling of Ships is scheduled to come into effect in June 2025.

2. Act on Recycling of Containers and Packaging

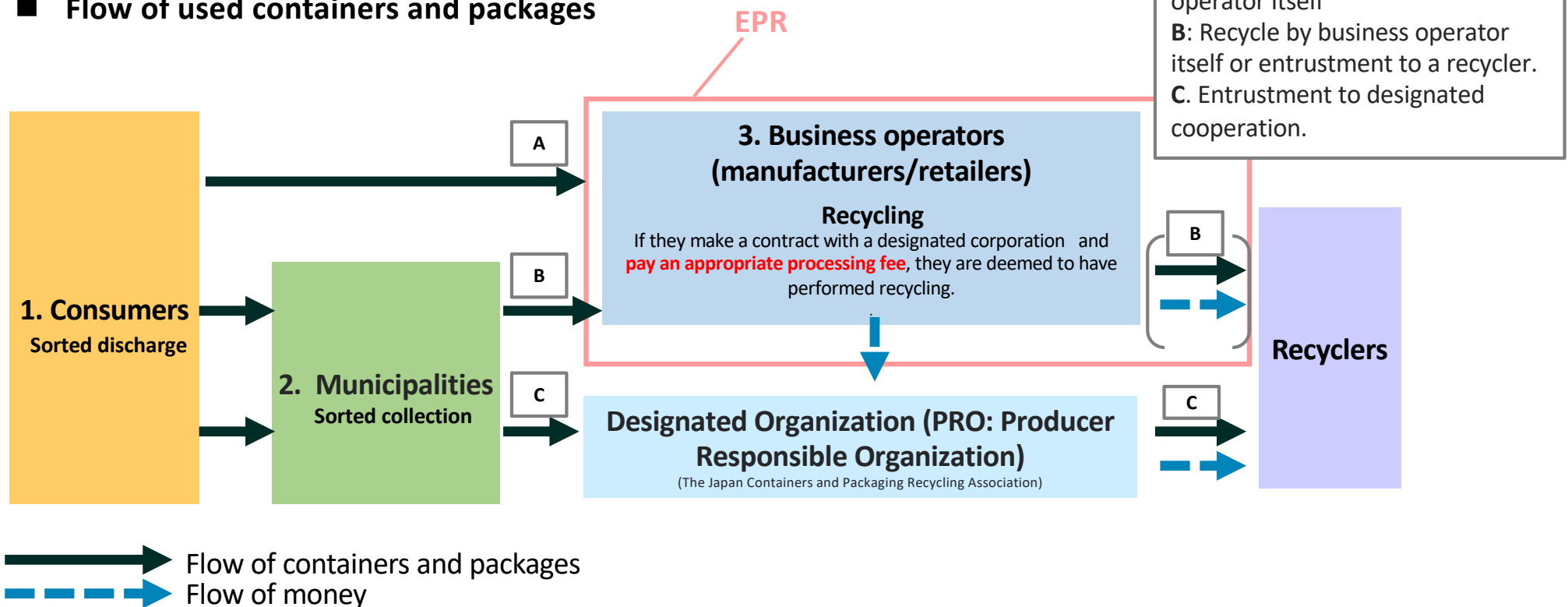


- The law decides shared responsibility of key stakeholders.
 - Consumers: sort and dispose** of waste containers and packages.
 - Municipalities: collect** waste containers and packages **in a sorted manner**.
 - Business operators: recycle** waste containers and packages.
- Recycling is mandatory for business operators (i.e., manufacture and retailers of containers and packaging)**. However, if they make a contract with a designated organization and **pay an appropriate recycling fee**, they are deemed to have performed recycling.
- Business operators are obligated to reduce the discharged waste containers and packaging **by promoting rational use, including the utilization of reusable containers and packaging** that curtailing excessive usage (non-binding obligation).

Mandated type of goods

PET bottles / Plastic containers and packaging / Glass bottles / Steel cans / Aluminum cans / Paper packs / Paper containers and packaging / Cardboard

Flow of used containers and packages



3. Act on Promotion of Resource Circulation for Plastics

- Set “**3R+Renewable**” as a basic principles
- Promote **(1) plastic resource circulation (2) marine plastic measures (3) international development (4) infrastructure development** to enhance circularity and contribute to plastic pollution.
- Based on this strategy, Plastic Resource Circulation Act has been established (next page)

Milestones

Reduce etc.	<ul style="list-style-type: none"> Reduce the use of single-use plastics through valuing such as mandatory charge for plastic bags Promote the development and use of substitutes for Petroleum based plastics 	<p>(1) Cumulative suppression of 25% of single-use plastics by 2030</p>
Recycle	<ul style="list-style-type: none"> Easy-understanding and effective separate collection and recycling of plastic resources Minimize costs and maximize the effective use of resources through collaboration and overall optimization Development of domestic resource circulation system Fair and optimized recycling system which promotes innovation 	<p>(2) Reusable/recyclable design by 2025</p> <p>(3) Reuse/recycle 60% of containers and packaging by 2030</p> <p>(4) Effective use of 100% of used plastics by reuse, recycling and thermal recovery by 2035</p>
Recycled materials Bio-plastics	<ul style="list-style-type: none"> support technical innovation and infrastructure development Measures to stimulate demand (green public procurement, incentives etc.) Handling of chemical ingredient information for recycling Use bio-based plastics Bio-plastics introduction roadmap 	<p>(5) Double the use of recycled content by 2030</p> <p>(6) Introduce about 2 million tons of bio-based plastics by 2030</p>

- This Act **addresses full lifecycle** of plastics (i.e. from designing products to disposing plastic waste) and **involves all stakeholders** in promoting “3R+Renewable” and increasing circularity.

[Guidelines for Design for the Environment]

- Develop **guidelines for Design for the Environment** for manufacturers and establish a mechanism to **certify** products designed in accordance with the guidelines.
 - **The government procures preferentially** the certified products (under the Act on Promoting Green Procurement) and **provides financial support to the manufactures**.



<Replaceable bottles>

EPR

[Reduction of Single-use Plastics]

- Set criteria for retailers and service providers to reduce single-use plastics.
 - The competent ministers may issue recommendations and orders to suppliers who provide a certain amount of single-use plastics when their actions are found significantly insufficient in light of the criteria.



Single-use plastics

EPR

[Separation, Collection, and Recycling by Municipalities]

- Municipalities can recycle plastic product waste effectively under **the current recycling scheme for containers and packaging**
- Municipalities develop a **recycling plan in collaboration with** recyclers.
 - When the plan is approved by the competent ministers, the recyclers can recycle plastics without sorting and bailing by municipalities.



[Collection and Recycling by Manufacturers and Retailers]

- Manufacturers and retailers develop a **plan to collect and recycle their used products**.
 - When the plan is approved by the competent ministers, the manufacturers and retailers **can recycle without service permission** under the Waste Management Act.



[Recycling by Waste Generators]

- Set criteria for waste generators to reduce and recycle plastic waste.
 - The competent ministers may issue recommendations and orders to waste generators who generate large amounts of plastics when their actions are found significantly insufficient in light of the criteria.
- Waste generators develop a **recycling plan**.
 - When the plan is approved by the competent ministers, the waste generators **can recycle without service permission** under the Waste Management Act.

EPR

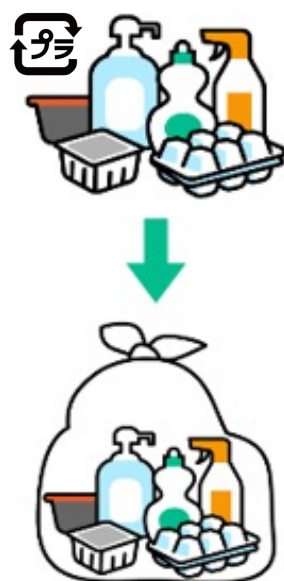
Source: Compiled from Ministry of the Environment data

Transition to circular economy through advancing circulation of resources

Promote the efficient collection and recycling of all plastic waste

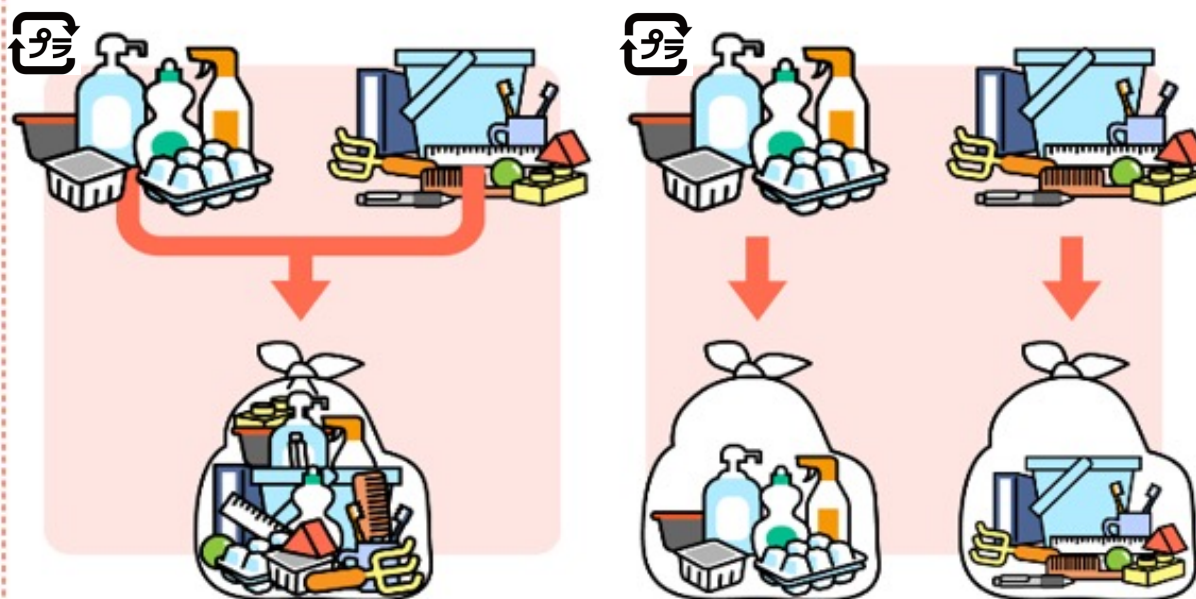
- To promote the sorted collection and recycling of plastic waste, municipalities set sorting standards for plastic waste and endeavor to take the necessary measures to ensure the proper sorting of waste in accordance with the sorting standards.

Before Enactment



Municipalities outsourced the recycling of collected waste plastic containers and packaging to companies designated under the Container and Packaging Recycling Act.

After Enactment



Municipalities collect plastic waste using a sorted collection method selected from two options, (1) sorting waste plastic containers and packaging and other plastic waste into a single group (left) and (2) separating waste plastic containers and packaging from other plastic waste (right), and recycle the waste by outsourcing it to companies designated under the Container and Packaging Recycling Act or developing recycling plans and having them approved.

Recycling plastic waste by delivering it to companies designated under the Container and Packaging Recycling Act

Recycling plastic waste by outsourcing it to companies designated under the Container and Packaging Recycling Act

Recycling plastic waste by developing a recycling plan and having it approved

(Reference) Examples of Demonstration Projects for Establishing Resource Circulation Systems for Plastics to Support a Low-carbon Society (indirectly funded)



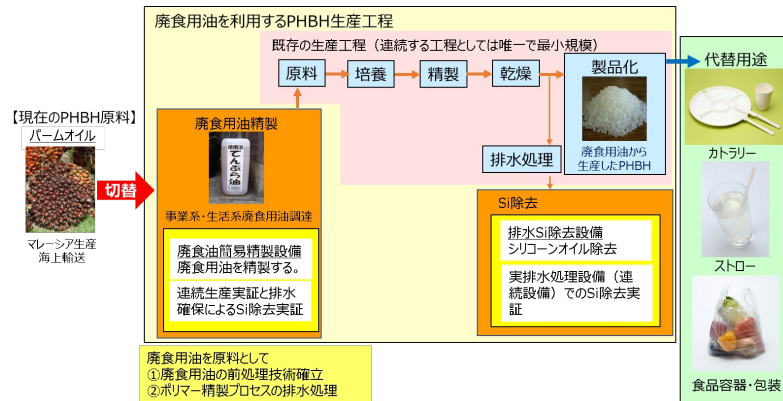
Demonstration of the efficient production and commercialization of PHBH using waste cooking oil

Project period: FY2020-2021

● Kaneka Corporation



This project aimed to establish a pretreatment technology for the efficient production of biodegradable plastic PHBH using non-edible biomass available in Japan, such as waste cooking oil, and validate the entire production process, from culture preparation to wastewater treatment in a practical facility.



Demonstration of the conversion of marine fishing gear to bioplastics and their commercialization and wide application

Project period: FY2020-2021

● Nichimo Co., Ltd.



This project created prototypes for marine fishing gear (e.g., fishing nets, ropes, and floats) made from bioplastics mainly composed of biodegradable PLA and conducted degradation tests using different methods, depending on the distribution and drifting environment of the gear after release into the ocean, as well as physical property and verification tests.

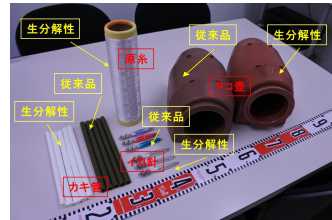
代替素材を用いた試作・製造・物性検討 → 分解性評価 → 性能・利用適正評価 → 普及に向けた検討



漁港に散乱する海洋資材



代替素材を用いたこま



Demonstration of a mold processing technology for bioplastic products with a high content of surplus rice

Project period: FY2020-2021

● Biomass Resin Engineering Co., Ltd.



This project aimed to establish a mold processing technology for products with a high biomass content, develop technologies to reduce costs, enable the stable production of biodegradable biomass plastic resin, and improve the recyclability of biomass plastics.



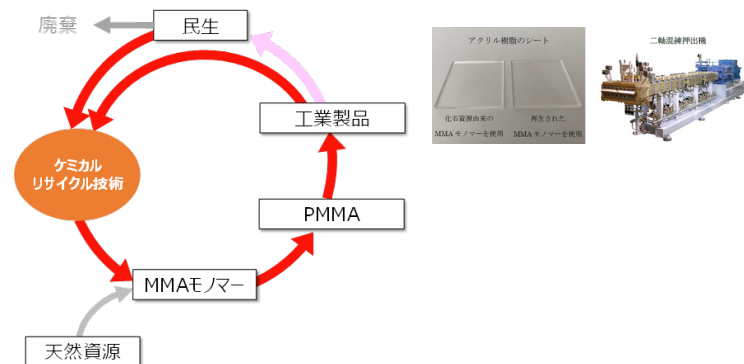
Demonstration of the PMMA chemical recycling model

Project period: FY2021-2022

● Sumitomo Chemical Co., Ltd.



This project aimed to establish and validate a business model (from collection to sale) for a PMMA chemical recycling chain depolymerizing PMMA (acrylic resin used in acrylic boards, etc.) into MMA (raw material) and polymerizing the MMA back into PMMA.



(Reference) Examples of Projects for Promoting the Installation of Advanced Resource Circulation Facilities to Establish a Low-carbon Society



Production of biomass plastic products from bamboo, rice straw, etc.

Project period: FY2021

● Amica Terra Co., Ltd.



This project aimed to produce vegetable-derived bioplastic from surplus resources available in each region, such as abandoned bamboo forests and tree bark. To contribute to regional resource circulation, the project installed raw material crushing, drying, stirring, and molding equipment to prepare pellets from a mix of crushed vegetable fibers and vegetable-derived starch.



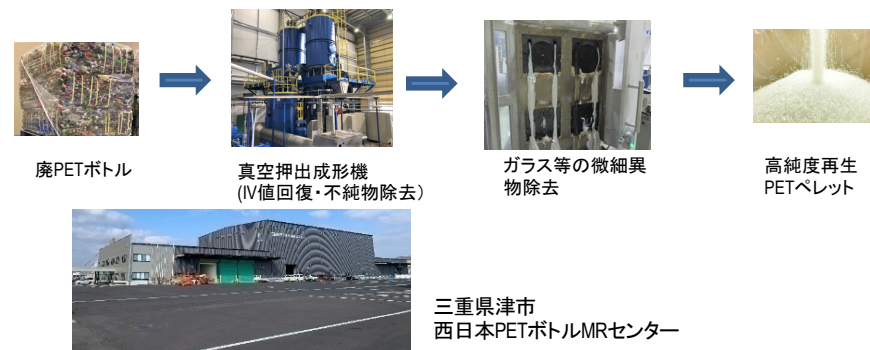
Contaminant removal for recycling into high-quality PET bottles

Project period: FY2021

● Kyoei J&T Recycling Corporation



In October 2021, a recycling facility was put into service with a horizontal recycling capacity of 50,000 PET bottles per year. The facility was upgraded with equipment to remove fine contaminants, such as glass fragments, from industrial waste from lower-quality PET bottles to purify and recycle them back into high-quality PET resin equivalent to virgin one.



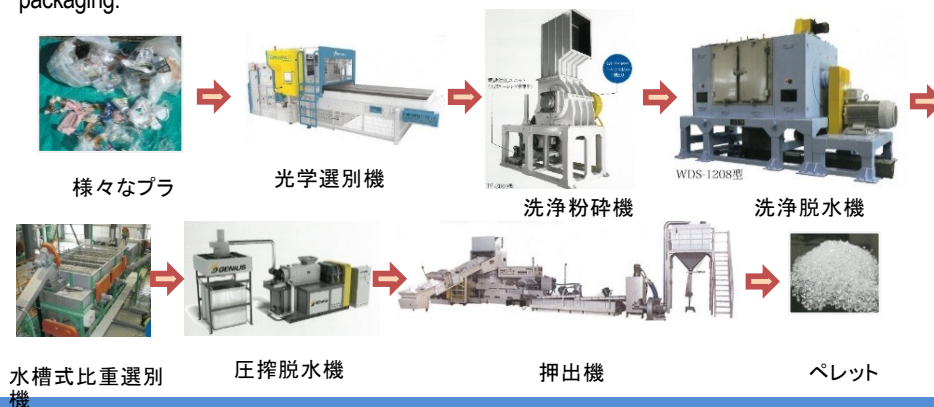
Development of advanced material recycling facilities to meet the broader scope of recycling

Project period: FY2021

● Katosyoji Co., Ltd.



This project aimed to develop advanced material circulation for plastic products in accordance with the Plastic Resource Circulation Act by installing a recycling line, including automated optical sorting and weight-based sorting machines, in addition to the existing recycling line for plastic containers and packaging.



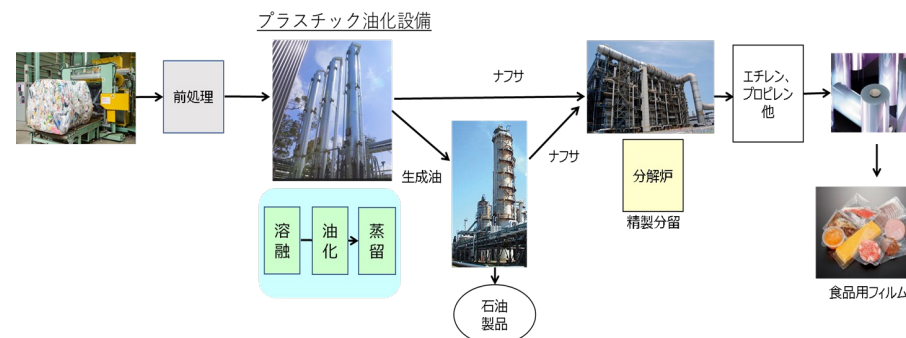
Waste plastic chemical recycling (oilification)

Project period: FY2021-2023

● Mitsubishi Chemical Corporation



In this project, waste plastic was converted into oil, which was distilled into naphtha and other oils. Then, a cracking furnace was used to thermally crack naphtha into basic raw materials for plastics, such as ethylene and propylene, which were recycled into different products, such as films.



Number of projects adopted from the FY2020 supplementary budget to the FY2024 budget: 92 plastic recycling facility projects and 7 biomass plastic production facility projects