
Resource Circulation Strategy for Plastics

THE JAPAN PLASTICS INDUSTRY FEDERATION

May 22, 2019

1. Introduction
2. Basic Concept of Resource Circulation Strategy for Plastics
3. Background of Plastic Resources Recycling in Japan
4. Resource Circulation Strategy for Plastics
 - 1) Present Status of Plastic Resource Circulation
 - 2) Material Recycling Strategy
 - 3) Chemical Recycling Strategy
 - 4) Bioplastic Strategy
 - 5) Approaches Toward
the Issue of Marine Plastic Waste
5. Conclusion

1. Introduction

We at the Japan Plastics Industry Federation have had arguments and proposals concerning 3R with a view to conform to the Containers/Packaging Recycling Act for a long time. Recently, based on our four-year plan (FY 2017 to FY 2020), we started reviews toward the *formation of ideal plastic resources recycling society*, which further expanded and developed the plan in June 2018. On the other hand, the Japanese government established the Resource Circulation Strategy for Plastics Subcommittee (hereinafter referred to as the “Subcommittee”) in the Central Environment Council, considering the official announcement of EU Plastics Strategy and the international escalation in interest in the marine plastic waste issues, and promoted discussions toward formulation of Japan’s Resource Circulation Strategy for Plastics started in August 2018. As a result, the final plan was recommended to the Minister for the Environment in March 2019.

The Federation has been delivering opinions, as a member of the Subcommittee, to contribute to the formation of the national strategy and fostering communication with industries and policymakers. We also officially announced the Basic Concept of the Resource Circulation Strategy for Plastics toward realization of the optimum plastic utilization society in October 2018 and introduced the Concept in the Subcommittee.

Introduction (Continued)

The Federation, based on the basic concept and considering the content regarding how the national Resource Circulation Strategy for Plastics should be, enhanced discussions wherein the principal contention includes “*ideal recycling*” and “*utilization of bioplastics*” with a lot of related parties. The result is that the orientation and specific measures including innovations of “*optimum plastic utilization*” were summarized. We integrated our approaches to the issue of marine plastic waste that we have been developing for a long time with the summary, thereby formulating and officially announcing the “Resource Circulation Strategy for Plastics” as the Japan Plastics Industry Federation.

The Strategy also constitutes the proposal for measures toward promotion of recycling, reuse, introduction of biomass plastics, etc., which were set forth as the milestones in the Resource Circulation Strategy for Plastics of the Central Environment Council. In addition, the ultimate solution of the issue of marine plastic waste is not to produce used plastics into the environment, and the Strategy also sets forth the measures for prevention of marine pollution caused by outflow of plastic waste (Marine Plastic Waste Zero Emission). We hope that the orientation shown in the Strategy would be the guideline for the sustainable plastics utilization society.

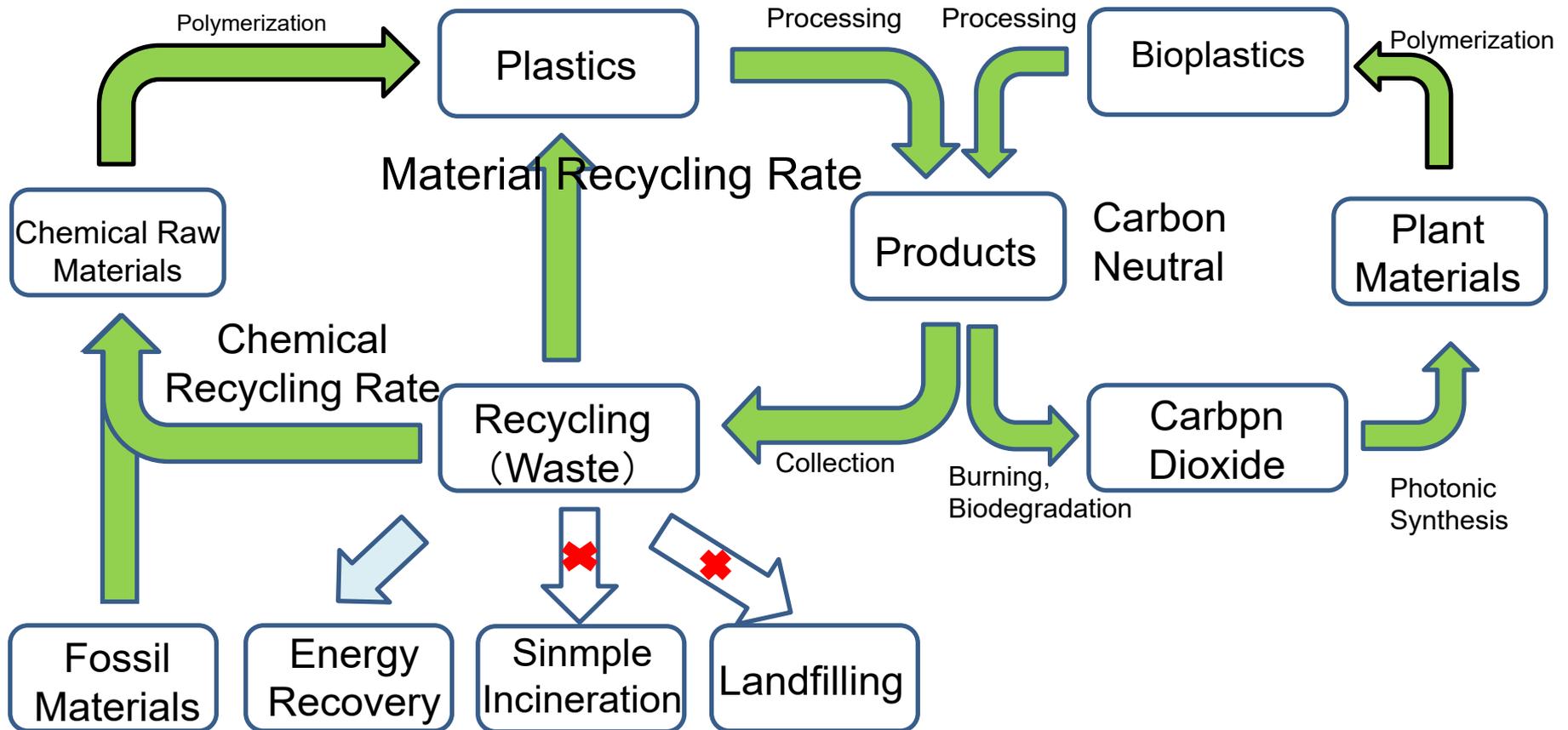


2. Basic Concept of Resource Circulation Strategy for Plastics

Officially Announced on October 17, 2018

- Toward realization of optimum plastic utilization society; Under cooperation with the administration, domestic/international related industries, etc. –
- Utilize versatile and useful functions of plastics and reduce environmental burdens from the viewpoint of life cycle, thereby aiming for the use of plastics combined with the environmental considerations.
- Aiming for smarter uses of plastics, make efforts for promotion of understanding and cooperation with users and consumers.
- While accelerating effective uses including chemical recycling, energy recovery, etc., make efforts to create new values and new demands jointly with users and consumers toward promotion of use of recycled materials.
- Make efforts for innovation of plastics that contribute to realize sustainable society, including utilization of bioplastics.
- Plastic industries shall take the initiative in making efforts for the resolution of issues of marine plastic waste through their supply chains.

- Aim for the achievement of simple incineration and zero land filling
- Utilize resources 100% effectively in consideration of economic efficiency, technical possibilities, and other factors



▪ Energy recovery is one of the measures for effective utilization of waste plastics, either

3. Background of Plastic Resources Recycling in Japan

1) Industrial structure pursuing high quality/high productivity

- High quality is demanded also for recycled products.
- Environmental values of recycled products are hardly well-evaluated.

⇒ Market expansion of substituted applications of virgin resins is difficult.

2) Material recycling is not easy for many products.

- Many of the raw material resins are manufactured in wide varieties and in small quantities.
- Utilization of complex materials for packaging materials (to deal with quality requirements).
- Products that are contaminated or in which foreign materials are mixed are hard to be material-recycled.

Typical example of products that are easy to be material-recycled:

PET bottles, foamed polystyrenes, white PSP trays

3) Restrictions on reclaimed site

- The incineration furnace-based waste treatment system was established for the volume reduction of waste, and the effective utilization rate has reached the world's leading level.

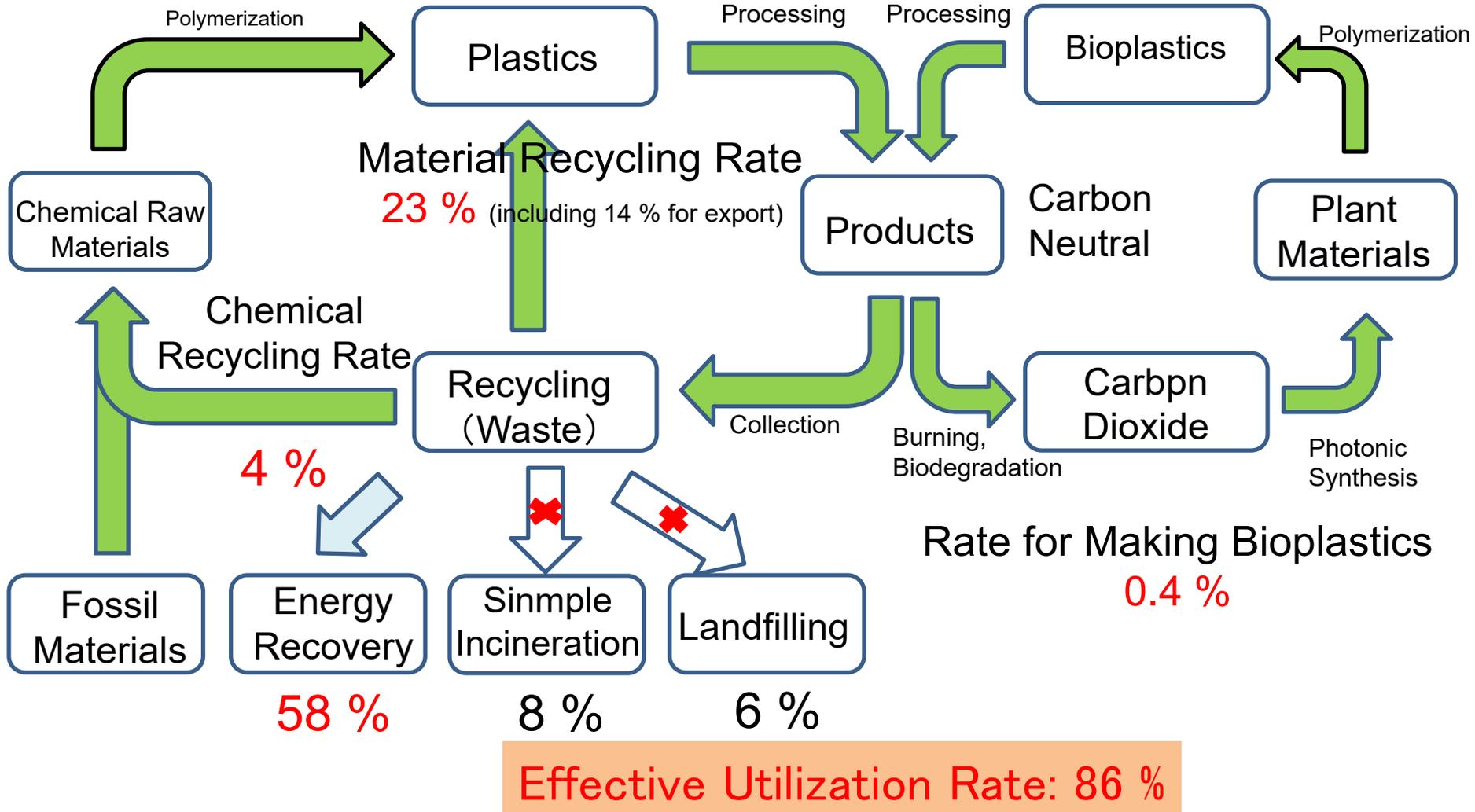
⇒ The incineration furnace is an excellent treatment facility that can realize volume reduction and detoxification of waste at the same time. (For the number of waste incineration facilities throughout the world, about 70% is in Japan.)

4) Dissemination of composting treatment facilities is insufficient.

- Because composting treatment of organic waste is not disseminated, the treatment method of biodegradable plastics has not been established yet.

5) Separate collection of waste plastics has been firmly fixed through cooperation by consumers.

4-1) Present Status of Plastic Resource Circulation



Values in Material Flow Chart 2017 published by Plastic Waste Management Institute were processed by the Japan Plastics Industry Federation.

[Present Situation of Material Recycling]

- The material recycling rate in 2017 was 23% (including 14% for export).
- Exporting of plastic waste should be reduced to zero at an early date, considering the overseas export ban.
- The material recycling volume remains almost unchanged since it rose above 2 million tons in 2006.
- The recycling rate for PET bottles is 85% (on sales volume basis). An extremely high recycling rate has been maintained compared to Europe and the United States.
- The recycling rate for foamed polystyrene is 54%, and the effective utilization rate is 90% (on recovered volume basis).
- Some member companies have established the recycling system voluntarily to recover food trays from the storefronts of supermarkets.

[Problems that need to be overcome]

- Domestic recycled material markets have not been expanded yet.
- The environmental values of recycled materials are not evaluated, and thus, they are not proactively used.
- Export restrictions on plastic litter due to overseas export bans.

[Orientation to reach for]

- ◇ Reduce environmental burdens through promotion of material recycling.
 - Open up potential markets of recycled materials in Japan and overseas countries.
 - Achieve zero export of plastic litter whose separation is insufficient.
- ◇ Make efforts for promotion of understanding and collaboration by all stakeholders.
 - The environmental values of recycled materials will be evaluated, and the materials will be used proactively.
 - 100% recovery of PET bottles, foamed polystyrene, and white trays and 100% effective utilization thereof.

[Measures for Realizing Orientation to Reach For]

- ◇ Opening up of potential markets for recycled materials
 - Promote matching between needs and seeds through open innovation and open up potential markets where features of recycled materials can be exploited.
 - Make efforts for development/practical realization of recycling technologies through innovation under the cooperation between the public and private sectors.
 - Practical realization of sophisticated recycling technologies and sorting technologies that are capable of producing products that satisfy quality requirements. Make the discharge situation of plastic waste visible and promote establishment of stable supply chains of recycled materials, thereby expanding the recycled materials markets.

◇ Evaluation/Use of Recycled Materials

- Aiming for expansion of use of recycled materials, give publicity/public awareness that the use of recycled materials results in effective use of resources and environmental conservation.
- Advance establishment of the incentive system regarding the use of recycled materials with the cooperation of the public and private sectors, thereby accelerating proactive use of recycled materials for the whole Japanese society.

◇ 100% Collection

- Collect 100% of PET bottles, foamed polystyrene, and white trays through cooperation with related parties.

Chemical Recycling Strategy

[Problems that need to be overcome]

Practical realization of chemical recycling that restores waste plastics back to chemical raw materials has not been progressing.

[Orientation to Reach For]

◇ Reduce environmental burdens through promotion of chemical recycling.

Make efforts to realize early practical realization of technologies/systems that restore waste plastics that are hard to be subjected to material recycling back to chemical raw materials.

[Measures for Realizing Orientation to Reach For]

◇ Promotion of development of new technologies through innovation.

Support the early practical realization of technologies that are capable of restoring waste plastics back to chemical raw materials. 14

[Problems that need to be overcome] (Biomass-based Plastics)

- Dissemination of bioplastics is on the way and performance of carbon neutral is not successfully exerted yet.
- Recognition of environmental values of bioplastics is insufficient.
- Supply performance is low.
- Prices are high.
- General-purpose plastics other than polyethylene and PET have not been biomass-converted.
- Homologation/visualization of bioplastics as low-carbon product has been unaccomplished.
- Regarding biomass plastics, evaluations on environmental impacts from various viewpoints, including CO₂ emissions, use of water, and impacts on foods are insufficient.

[Orientation to Reach For] (Biomass-based Plastics)

- ◇ Reduction in environmental burdens through the use of biomass plastics.

Introduce biomass plastics to the maximum extent through proactive joint initiatives between the public and private sectors.

[Measures for Realizing Orientation to Reach For] (Biomass-based Plastics)

- Give publicity/public awareness that plastics (such as disposal bags) that must be incinerated through joint cooperation with the government should be biomass-converted.
- Encourage the expansion of use through public procurement with initiatives by the government and local governments based on the Act on Promoting Green Purchasing and the usage incentive measures based on recycling systems.
- Further enhanced improvement in standards and certification systems.
- Develop dissemination promotion activities through joint initiatives between the public and private sectors.

Support examinations on overseas procurement or production inside or outside the country, aiming for securing sufficient supply capabilities.

Promote research and development, aiming for practical realization of biomass-conversion of other general-purpose plastics.

Examine opening up of domestic and overseas markets.

Evaluate environmental impacts from various viewpoints.

Bioplastic Strategy (Continued)

[Problems that need to be overcome] (Biodegradable plastics)

- The infrastructure for the separate recovery treatment of biodegradable plastics has not been established.
- Concerns that facilitate easygoing disposal (littering).
- Applications are limited because technologies for biodegradation are insufficient.
- Recognition of differences in biodegradability by materials is insufficient.
- Standards and acceptability criteria regarding marine biodegradable bio-based plastics are incomplete.
- Environmental values of biodegradable plastics are not evaluated.

[Orientation to Reach For] (Biodegradable plastics)

- ◇ Reduction in environmental burdens by using biodegradable plastics
 - Expansion of applications by considering features of biodegradable plastics
 - Utilization of marine biodegradable bio-based plastics

[Measures for Realizing Orientation to Reach For] (Biodegradable Plastics)

- In Japan, promote utilization of specified applications including films for agricultural use, food residue collection bags, and cutlery for events wherein waste treatment is taken into consideration, and expansion into overseas countries shall also be promoted proactively.
- Regarding biodegradability technologies, research, and development work shall be promoted through industry-university-government cooperation.
- Regarding biodegradation in the marine environment, global standardization shall be realized at an early date.

[Problems that need to be overcome]

- Control of outflow of plastics (raw materials/products) into the environment and recovery of outflowing materials are insufficient.
- Management of used plastics is insufficient.
- Academic knowledge on impacts concerning outflow of plastics into the environment is insufficient.
- The amount of outflow from developing countries in Asia is large.

[Orientation to Reach For]

- No marine pollution caused by outflow of plastic waste shall occur.
(Zero Emission of Marine Plastic Waste)
- Enlightenment of business operators and consumers
- Accumulation of academic knowledge
- Support for measures in developing countries in Asia
- Utilization of marine biodegradable bio-based plastic

[Measures for Realizing Orientation to Reach For]

Resolution of problems throughout supply chains

- Leakage protection of resin pellets: Expand the targets to small-size business operators other than the Federation members.

- Preparation/distribution of manuals and posters

- Survey/official announcement of the implementation situation

- PR activities toward resolution of marine plastic waste issues

- Expansion of participating companies/organizations

- Collection and sharing of approach examples and publicity utilizing Plastics Smart.

- Enlightenment activities for related industries, citizens and local governments.

- Holding of seminars for Federation members

- Dispatch of lecturers to external seminars, etc.

- Used plastics shall not be discharged to the environment.

- Support of collection activities of drifted/littered waste and communication activities with environmental NPOs/NGOs (JEAN, Arakawa Clean-aid Forum, All Japan River Litter Network, etc.)

- Coordination of academic studies
 - Verification studies concerning impacts of chemical substances adsorbed on microplastics on fish.
 - Development of methods for estimation of river litter transportation amounts.
 - Studies concerning microplastics generation mechanism, etc.
- Cooperation for China
 - Activities based on the Memorandum for Cooperation concerning Marine Plastic Waste Issues (signed on November 24, 2018) with China Petroleum and Chemical Industry Federation (CPCIF) and China Plastics Processing Industry Association (CPPIA)
- Participation in Japan Initiative For Marine Environment (JaIME) (Joint Executive Office)
 - Support of developing countries in Asia and education/enlightenment in Japan
- Proactive participation in Clean Ocean Material Alliance (CLOMA)
- Development and utilization of marine biodegradable plastics technologies intended for applications wherein such plastics unintentionally outflow into the oceans, considering the roadmap of the government.

5. Conclusion

Toward Realization of Plastic Optimum Utilization Society

We will aim for making efforts for the innovation of plastics that contribute to a sustainable society by utilizing material recycling, chemical recycling and bioplastics, promoting formation of the plastic resources recyclable society, and ensuring zero marine pollution caused by the outflow of plastic waste (Marine Plastic Waste Zero Emission).

<Specific Example of Our Approaches>

- Promote matching between needs and seeds through open innovation, thereby opening up potential markets where the features of recycled materials can be fully utilized.
- Support early realization of technologies that are capable of restoring waste plastics back to chemical raw materials through innovation.
- Publicity/enlightenment of bioplastics toward expansion of their usage.
- Promotion of the use of biodegradable plastics in specific applications wherein treatment of waste materials are taken into consideration.
- Approaches to marine plastic waste issues throughout the supply chains.