

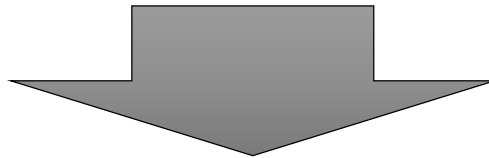
Japan's Contribution to Combatting Marine Plastic Litter through Innovation

Tomoyoshi Yahagi
Deputy Director General for Technology and Environment
Ministry of Economy, Trade, and Industry
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Japan's Action-Plan against marine plastic litter

Basic Understanding

- ◆ The solution to the marine pollution problem concerning plastic waste relies on both proper collection and waste management methods.
- ◆ Innovative solutions, such as the development of new materials, are vitally important for addressing the plastic waste issue.



METI's task

- ◆ The Ministry of Economy, Trade and Industry will work on measures for the development and introduction of marine biodegradable plastics, etc., in cooperation with industry efforts and public-private partnerships.

METI efforts pertaining to measures against marine plastic litter

Establishment of a technology roadmap for marine biodegradable plastics

- ◆ Marine biodegradable plastics is one of the most promising, cutting-edge technologies for addressing this issue. Japan is a leader in this field and can contribute much. METI will further enhance and disseminate these technologies by developing a roadmap in order to solve marine plastic litter.

<Major technical issues>

- ◆ Analysis of biodegradation mechanism in seawater
- ◆ Sophistication of the advanced biodegradable functions and development of new resins
- ◆ Manufacturing cost reduction for stable mass production, etc.

<Major supporting measures for R&D and introduction>

[METI] Support for R&D of marine biodegradable plastics and plastic recycling technology (1.83 billion yen budget for 2020 fiscal year)

[NEDO] New technology research program to help solve medium- and long-term issues in the energy and environmental fields (part of the 3.74 billion yen budget for 2019 fiscal year)

[AIST] International standardization support (ISO standards are being developed in a public-private partnership with respect to biodegradability evaluation of plastic products, etc.)



Outline of Roadmap for Development and Implementation of Marine Biodegradable Plastics

May 2019

		2019	2020	2021~25	~2030	~2050
Social implementation of practical technology (MBBP1.0)	Improve reliability for marine biodegradation	Establish organization	Summarize issues	ISO standard proposal 【AIST,JBPA】 Test study for enhancing biodegradation function evaluation 【NEDO, etc.】		
	Expansion of production facilities and cost improvement for mass production			Enhancement of mass production capacity Improving bioprocess of manufacturing 【NEDO, etc.】		
	Demand development		Promoting domestic and foreign exhibitions and business matching 【CLOMA】 Public procurement		Detergent bottle Agricultural multi-film	
	Certification / Separate collection and processing	Shopping bag garbage bag straw, cutlery		Certification System 【JBPA】 Separate collection and processing		
Multi-utilization through composite material development (MBBP2.0)			Cost reduction of cellulose nanofiber, etc., improve moldability of composite materials 【NEDO, etc.】			Mask Packing cushion
Research and development of innovative materials (MBBP3.0)			Analysis of marine biodegradability mechanism 【NEDO, etc.】 Addition of biodegradation control function Discovery of new microorganisms 【NITE】 Alternative materials for fishing gear 【Fisheries Agency, AIST】	Creation of innovative materials applying marine biodegradability mechanisms		

Major voluntary efforts by industry pertaining to measures against marine plastic litter

○ CLOMA (Clean Ocean Material Alliance)

- ◆ Established in January this year, by operators involved in the plastic products supply chain, including the chemical and the retail industries.
- ◆ Working on sustainable use and development and introduction of new materials.

○ JaIME (Japan Initiative for Marine Environment)

- ◆ Established last September by major companies and groups in the chemical industry.
- ◆ Working on analysis and dissemination of information concerning problems with marine plastic litter, accumulation of scientific knowledge, and support for emerging Asian countries.

○ AEPW (Alliance to End Plastic Waste)

- ◆ Established in January 2019 as an alliance of global companies, including those from Europe and the United States.
- ◆ In the first five years, \$1.5 billion to be invested to develop measures to control and manage plastic waste and promote post-use solutions.
- * Japanese corporate members include Mitsubishi Chemical, Sumitomo Chemical, and Mitsui Chemicals.

Clean Ocean Material Alliance (CLOMA)



In order to tackle marine plastics litter, CLOMA was established for the purpose of strengthening collaboration among related businesses (material manufacturers, plastics producers, and retailers) that create supply chains.

Members: 258 companies / groups (as of September 3), Chairman: Kao Corporation

<Main activities>

Promotion Subcommittee

Sharing technical information to facilitate selection of new material best fit for each use

- Technology and business matching
- Transmitting information based on precedent cases and holding an exhibition
- Establishing dissemination and promotion measures for sustainable plastics and new materials

Manufacturers having alternative technologies (chemical/paper manufacturer, etc.)



Information provision / matching

User companies interested in new technology (distribution, food, beverage, consumer products, etc.)



Molding processing manufacturers interested in new technology



Clarification of problems



Provision of information

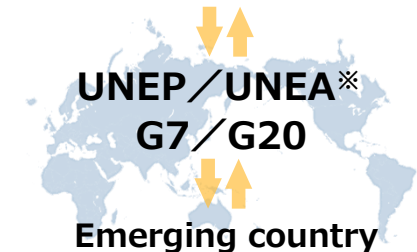
Gathering information

Transmitting information

International Cooperation Subcommittee

Information gathering in cooperation with international organizations, research institutes etc., information dissemination to developing countries etc., technology consulting

Advanced country



Emerging country

※United Nations Environment Programme
United Nations Environment Assembly

Clarification of problems



Provision of information

Technical Subcommittee

Technical exchange on latest development results, holding technical seminars

Operators who have (or who are planning to work on) materials development technology



Technology exchange and collaboration



Related research institute
Related industry groups, etc.

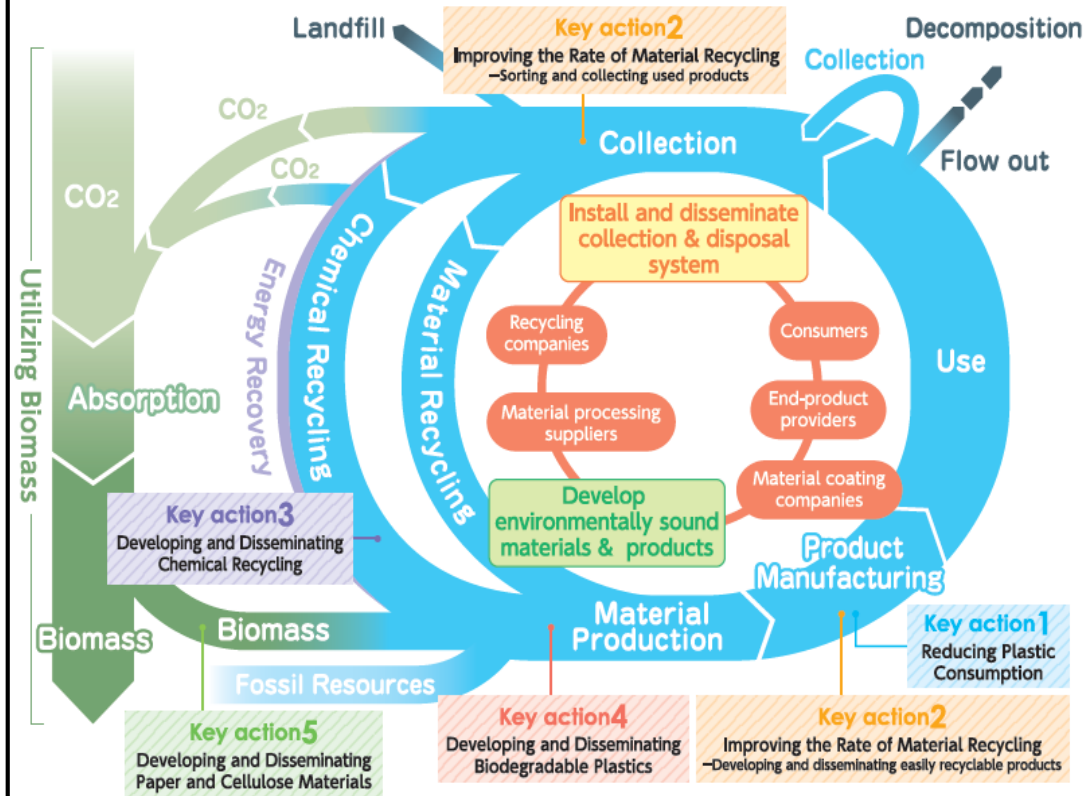
Ideal Vision

- CLOMA builds a sustainable 3Rs system and contributes with its materials technologies to realize a world with a Clean Ocean. CLOMA strive to concurrently achieve the Sustainable Development Goals (SDGs) by promoting the five Key Actions while sharing CLOMA Principles.

CLOMA Principles

- ① We will contribute to the attainment of SDGs and clean ocean through the development, production and use of materials and products.
- ② We will proceed with the following goals as two wheels: thoroughly implement proper collection and disposal of used plastic products, while deepening efforts on the 3Rs and using alternatives that are environmentally sound materials/products.
- ③ We will share technology, knowhow and experiences among our members at the maximum level, and create larger-scale innovations including new business models.
- ④ We will optimize the combination of technology development and social systems, and gain understandings from stakeholders to accelerate social implementation.
- ⑤ We will disseminate a "Japan model" to the world which enables circular use of materials and reduction of environmental load by accommodating our model to the situation and needs of each country.

Relationship between the five Key Actions and the Lifecycle of Plastic Products



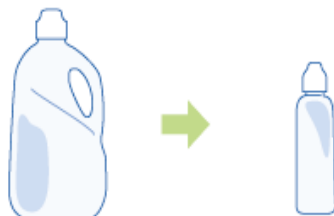
The five Key Actions

Key action1 Reducing Use of Plastics

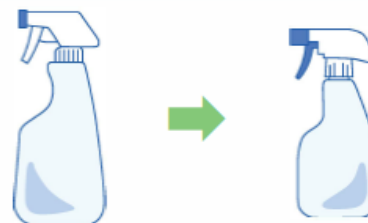
Easy refill design



Condensing the content

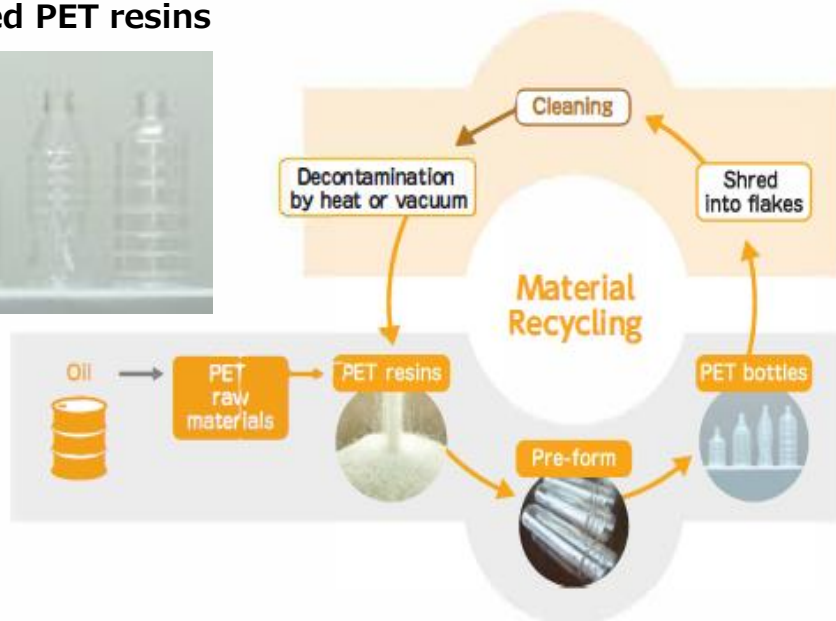


Optimization of products' structural design

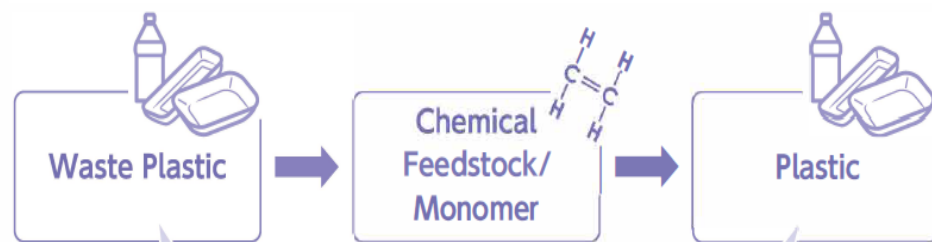


Key action 2 Improving the Rate of Material Recycling

PET bottles manufactured with recycled PET resins



Key action 3 Developing and Disseminating Chemical Recycling



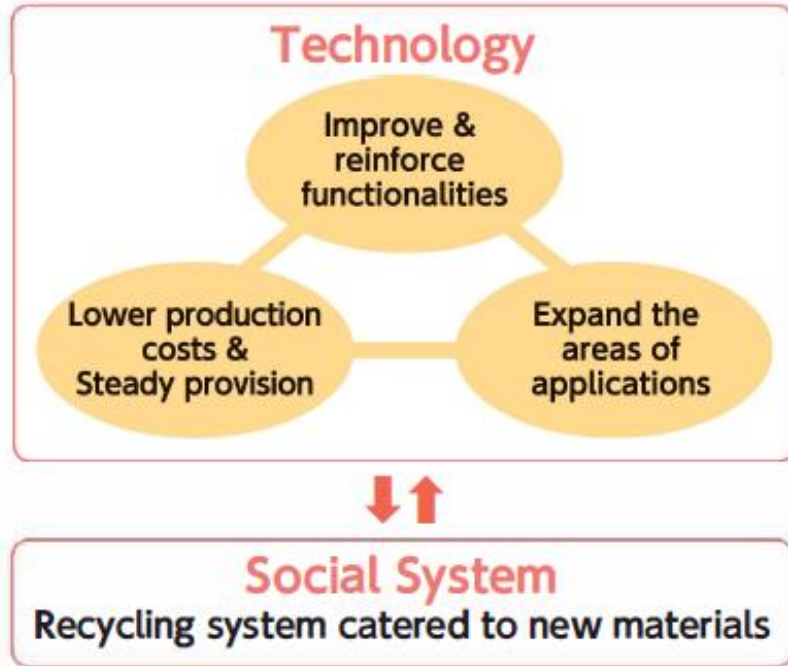
Recyclable even if different types of plastics are mixed, or contaminated to a certain degree.

By ensuring equivalent quality as the products made from virgin materials, it is highly likely that areas of applications for renewed plastics can be expanded.

Note: Monomer is a low-molecular constituent forming plastics, which are also classified as polymers (chemical compounds with macromolecules).

The five Key Actions

Key action 4 Developing and Disseminating Biodegradable Plastics



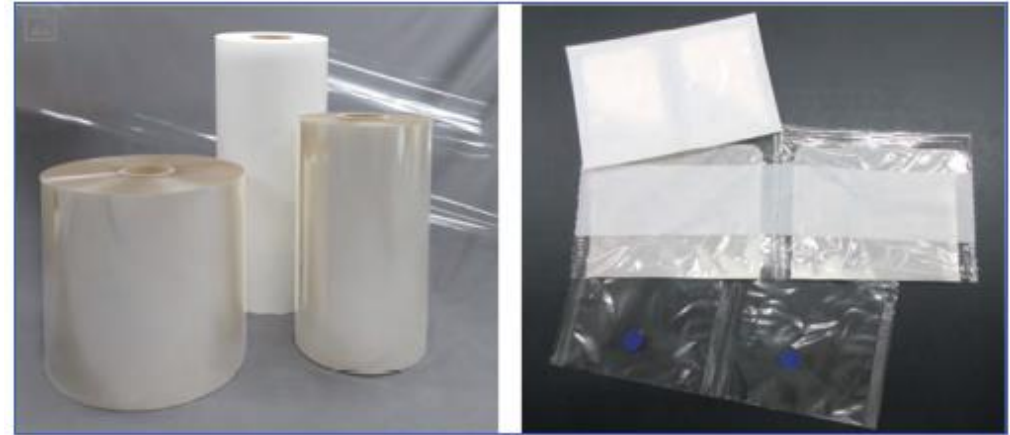
Biodegradable Polymer PHBH



PHBH is produced by a microorganism fermentation process, in which plant oils and its fatty acids are used as a primary raw material.

Key action 5 Developing and Disseminating Paper and Cellulose Materials

Cellophane and related products



※Picture on the right shows the packages for medicines(milky-color cellophane, partially-printed items, and transparent items)

Fragrances using cellulose beads



Proper waste management and innovation
make it possible to
“take the blue ocean back”

