

Contribute to the Environment

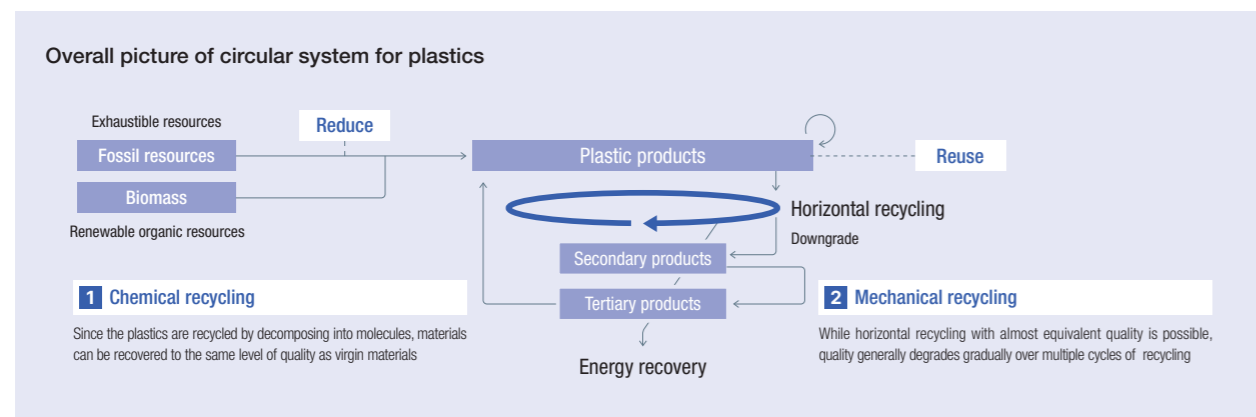
Contribute to Recycling Resources

For sustainable use of resources, we need to reduce the consumption of natural resources while at the same time circulating the resources we have. In addition to waste management and effective use of resources at our offices and Works, Sumitomo Chemical is working on the development and social implementation of recycling technologies for plastics and other resources.

Initiatives to Realize Circular System for Plastics

Overall picture of circular system for plastics

Toward a circular system for plastics, it is important to make an effort to reduce, reuse, and recycle (mechanical recycling and chemical recycling) at each stage of the plastic value chain.



Our KPIs for Resource Recycling

Sumitomo Chemical has identified "contribution to recycling resources" as one of our material issues to be addressed as management priorities, and we have set the amount of recycled plastic resources used in the manufacturing process as a KPI for this purpose. We are working to replace 200k tons/year of plastic used in our manufacturing process with recycled resources by 2030.

KPI: The amount of recycled plastics utilized in manufacturing processes	
Target	200k tons/year by FY2030
Results	FY2023 7,300 tons

Development of the Meguri® Brand

Meguri® is a brand of plastic products and chemicals that can be obtained through recycling technology and contribute to reducing environmental impact. Meguri® products are the crystallization of the latest recycling technologies and the environmentally friendly technologies that we have cultivated in various fields as a diversified chemical company. We will expand the Meguri® product lineup and increase production and sales of these products, thereby playing a role in realizing a circular economy.

The brand name Meguri® means "circularity" in Japanese. The design of the icon is a deformed version of the kanji character "廻", which means "circularity" in Japanese.



1 Initiatives for Chemical Recycling

We promote development of chemical recycling technologies through multiple routes in parallel, by combining our catalyst design and chemical process design technologies, in collaboration with external parties. Utilization of these technologies will reduce fossil resource use and plastic waste emissions, as well as GHG emissions from plastic waste incineration.

Technology	Cooperating Partners	Reference
① Polyolefin production from waste-derived ethanol	SEKISUI CHEMICAL CO., LTD.	Completion of test production facility in April 2022
② Direct olefination of waste plastics	Maruzen Petrochemical Co., Ltd. Muroran Institute of Technology	NEDO*1 GI Fund Project*2 (Project scale: approx. 25.30 billion yen)
③ Ethanol production using synthesis gas derived from waste plastics	National Institute of Advanced Industrial Science and Technology (AIST)	
④ Efficient alcohol production from CO ₂	AIST Shimane University	NEDO GI Fund Project (Project scale: approx. 24.08 billion yen)
⑤ Olefin production from alcohols	AIST	

*1 National Research and Development Agency, New Energy and Industrial Technology Development Organization (NEDO) *2 Green Innovation Fund Project

4 CCU Technology for Producing Methanol from CO₂

NEDO GI Fund Project

We have completed the construction of a pilot facility to establish a highly efficient process for producing methanol from CO₂ at our Ehime Works and have commenced operations at the facility. Carbon capture and utilization (CCU) technology is expected to serve as a game-changing solution to halt global warming and achieve a circular economy for carbon by recovering CO₂ and utilizing it in products, and we are accelerating the development and spread of various new CCU processes. We have resolved issues in development through joint development with Shimane University Interdisciplinary Faculty of Science and Engineering, leveraging the internal condensation reactor (ICR), a technology that the University has been developing. We aim to complete the demonstration of this technology by 2028, as well as start commercial production using the new process and license the technology to other companies in the 2030s.

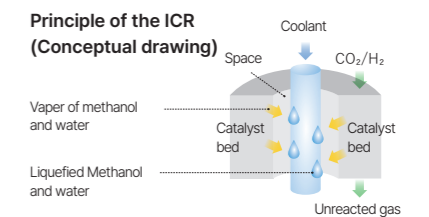


Photo of the pilot facility

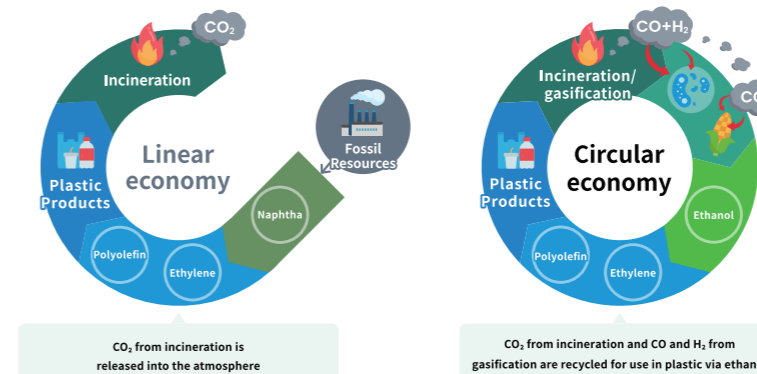
Features of This Technology

- Separating generated methanol within the reactor, which leads to improved yield, smaller equipment, and higher energy efficiency
- Separating by-product water, mitigating catalyst degradation

5 Environmentally Friendly Ethanol-Derived Polyolefin

NEDO GI Fund Project

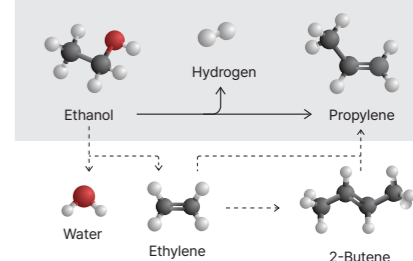
We have begun construction of a pilot facility to establish a process for producing propylene directly from ethanol, which is attracting attention as a sustainable chemical raw material. We will work to complete the construction of the pilot facility at our Chiba Works by the first half of 2025 and step up efforts to quickly implement the technology in society.



Features of This Technology

- Producing propylene directly from ethanol
- A newly-developed compact and low-cost process
- Producing hydrogen as a by-product, in addition to propylene

Our direct production process

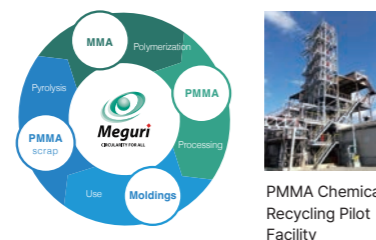


--> Combination of existing processes

Chemical Recycling System for Acrylic Resin

We have jointly developed with The Japan Steel Works, Ltd. a technology for pyrolyzing acrylic resin and recycling it, with high efficiency, into MMA (methyl methacrylate) monomer, which is a raw material for acrylic resin (polymethyl methacrylate or PMMA). We have built the pilot facility at our Ehime Works and aim to complete the demonstration of this technology and commercialization in FY2025.

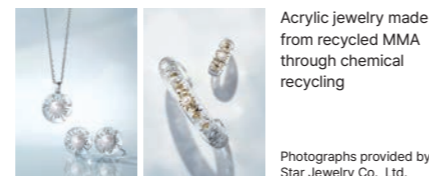
PMMA Recycling Mechanism



* PMMA made from recycled monomers reduces GHG emissions throughout the product lifecycle compared to products derived from fossil resources.

An example of collaboration

We are supplying the sustainable material "SUMIPEX® Meguri®," produced using our chemical recycling technology, for acrylic jewelry to be released by Star Jewelry Co., Ltd.

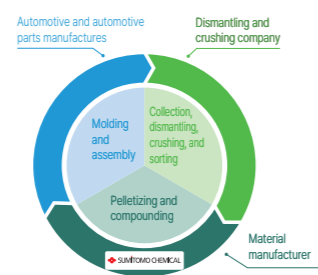


2 Initiatives toward Mechanical Recycling

We are promoting the development of various technologies to achieve mechanical recycling for plastic products.

PP (Polypropylene) Mechanical Recycling

As one of our mechanical recycling initiatives, our company and REVER CORPORATION have concluded a business alliance agreement for mechanical recycling of waste plastics derived from end-of-life vehicles. Through this alliance, the two companies will work to build a circular system for recycling waste plastics that includes the whole process, from collection to sorting to recycling into useful plastic resources, and to accelerate business development for plastic recycling.



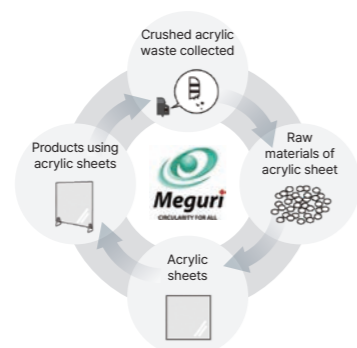
In September 2022, we made a decision to introduce a pilot-scale mechanical waste processing facility that performs an integrated process of high-precision sorting and removal of foreign matter according to the type and characteristics of waste plastics.

In addition, we will work towards the acceleration of business development.

In July 2024, we began to supply evaluation samples to automotive-related manufacturers.

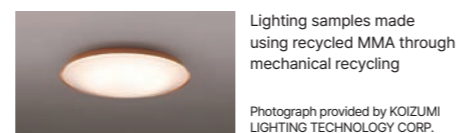
PMMA Mechanical Recycling

"SUMIKA ACRYL SHEET™ Meguri®" is an acrylic sheet commercialized by SUMIKA ACRYL Co., Ltd., made from mechanically recycled raw materials by collecting, sorting, and crushing waste materials generated in the acrylic resin manufacturing process. Despite being recycled material, this product has excellent optical properties.



An example of collaboration

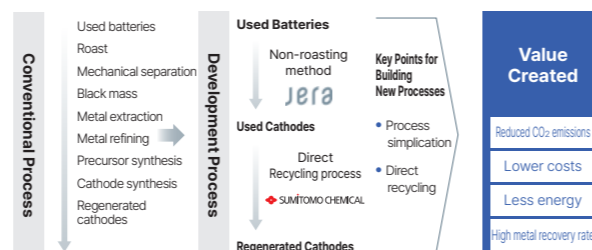
We are supplying the acrylic sheet "SUMIKA ACRYL SHEET™ Meguri®," produced through mechanical recycling technology, to Koizumi Lighting Technology Corp., a specialized lighting manufacturer.



Direct Recycling Initiatives for Battery Cathode Materials

NEDO Gi Fund Project

We are developing recycling technology that regenerates cathodes collected from used lithium-ion secondary batteries without returning it to metal. By simplifying the conventional process, CO₂ emissions are reduced and recycled cathode materials can be produced at low energy and cost. JERA Co., Inc. and we will promote development of the recycling technology and social implementation.



Contribute to the Environment

Sustainable Use of Natural Capital

Sumitomo Chemical has been conducting its business using various types of natural capital such as water and soil, and the entire Group has been implementing various initiatives for the sustainable use of natural capital. Now that the Kunming-Montreal Global Biodiversity Framework was adopted at COP15 in December 2022, and the so-called Nature Positive direction was outlined in the framework, which aims to halt, reverse and put biodiversity loss on a recovery track, we recognize that biodiversity conservation and sustainable use of natural capital are again material issues and we will make further initiatives.

Our Initiatives

Sumitomo Chemical is considering and promoting initiatives to realize Nature Positive from the perspectives of both obligation and contribution.

Obligation

- Works to reduce GHG emissions to near zero
- Reduction of chemical substance emissions
- Reduction of waste
- Effective use of water resources
- Promotion of sustainable procurement initiatives, etc.

Contribution

- Through products and technologies
 - Reduction of global GHG emissions
 - Improvement of soil environment
 - Improvement of water environment
- Nature conservation activities (30 by 30 initiatives), etc.

Specific Initiatives (Effective use of water resources)

Water risk assessment in areas where major production sites are located

We conduct water risk assessments from two perspectives: physical water risk (regional water stress, seasonal changes in water supply, flooding conditions, etc.) and vulnerability risk to water quality (water pollution conditions of water intake and discharge, impact on ecosystems, etc.).

Initiatives in regions with declining water resources

Based on the results of water risk assessment, we are taking measures tailored to local needs.

Locate	Around Bhavnagar Plant of Sumitomo Chemical India Ltd.
Evaluate	Water resources are decreasing due to population growth, increased demand for agricultural water, and decreased precipitation.
Assess	In the event of a water supply shortage, Sumitomo Chemical India will not be able to secure sufficient water for its production activities and will not be able to maintain stable operations.
Prepare	The company purchases domestic wastewater from households, treats it in the factory using earthworm farming technology, and reuses it. This approach reduces the use of river water by more than 70% while ensuring a stable water supply for production activities.

Wastewater treatment

Treatment using earthworm farming technology instead of the common activated sludge method to suit the characteristics of domestic wastewater, which contains relatively high levels of nutrients

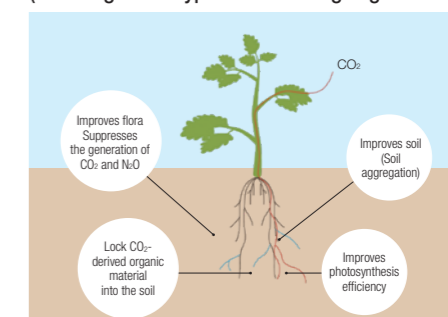


Specific Initiatives (Improvement of soil environment)

Soil fertility by mycorrhizal fungi

Mycorrhizal fungi, a type of soil-dwelling microorganism that lives in symbiosis with plant roots, stimulates plant growth. These fungi receive carbon compounds produced by plants through photosynthesis, which increases the amount of carbon compounds in the soil and promotes carbon fixation, thereby reducing atmospheric CO₂ and contributing to soil fertility. We are working on the development of technology utilizing mycorrhizal fungi to achieve carbon neutrality and solve food problems.

Benefits of mycorrhizal fungi (including some hypotheses undergoing validation)



Spread of no-till farming

Specific Initiatives → Regenerative Agriculture

Nature conservation activities at business sites aimed at achieving 30 by 30 goals.

In October 2023, the Miyoshima area within the Ehime Works was certified as a "Conservation Site for Human-Nature Symbiosis" by the Ministry of the Environment.

→ Sustainable Use of Natural Capital (Sustainability Report)