

ESG Meeting

December 14, 2021

Contents

Section. **1** **Sustainability initiatives at
Sumitomo Chemical**

Keiichi Iwata, President

Section. **2** **Carbon neutral grand design**

Hiroshi Ueda, Executive Vice President

Section. **3** **Initiatives toward a circular system
for plastic resources**

Yoshizumi Sasaki, Managing Executive Officer

Section.

1

Sustainability initiatives at Sumitomo Chemical

- Trends related to sustainability 3
- Grand design toward achieving carbon neutrality 8
- External evaluations, Social and Governance highlights and direction moving forward 18

Trends related to sustainability

Trends related to sustainability

Many important conferences are being held and the environment surrounding countries and corporations is changing rapidly Attention is focusing on climate change as well as preservation of biodiversity

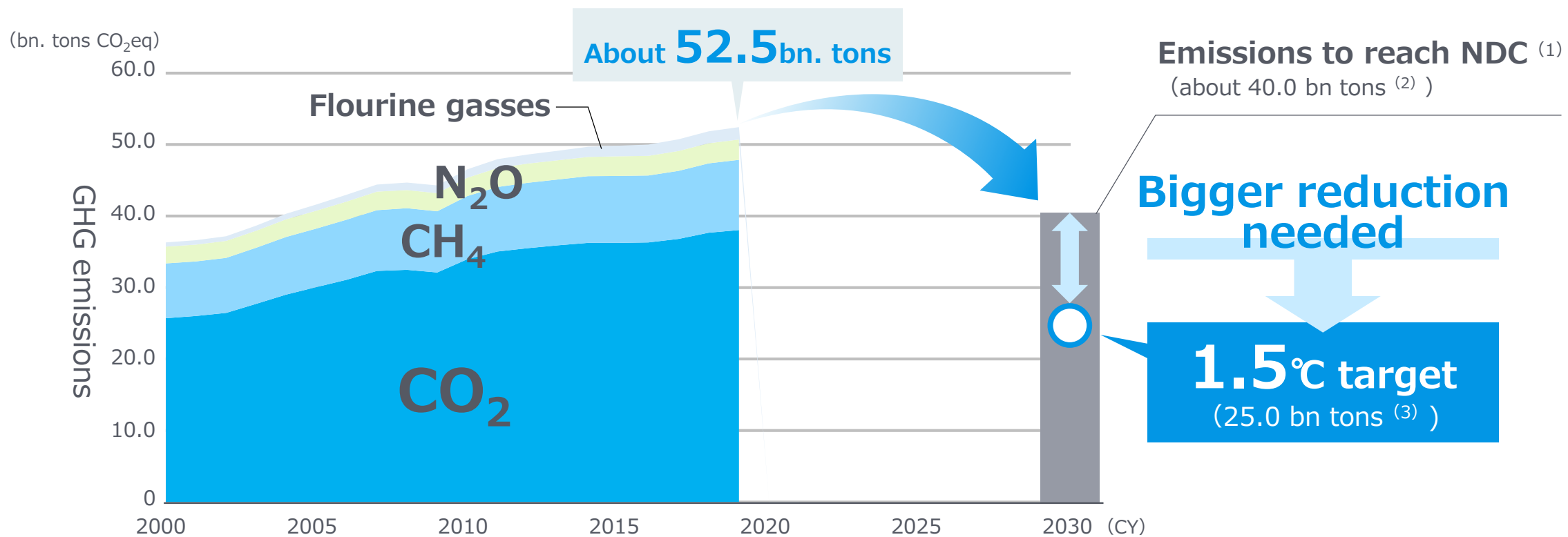


International trends related to corporate activities

- In Europe, progress toward requiring due diligence on environmental and human rights issues
- International standardization of ESG information disclosure standards
- More activity aimed at introducing TNFD and SBT for Nature

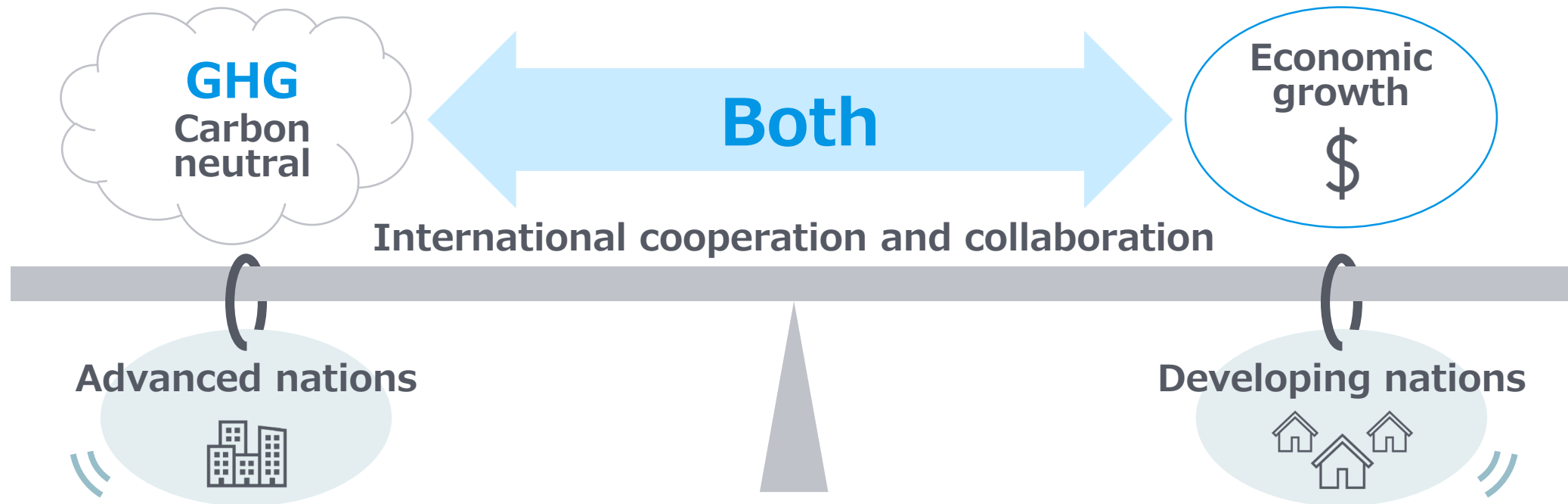
TNFD: The task Force on Nature-related Financial Disclosures

Global greenhouse gas(GHG) emissions need to be reduced further to reach 1.5°C target



(1) Nationally Determined Contribution toward greenhouse gas emission reductions, (2) Source: UN : COP26: Update to the NDC Synthesis Report, (3) Source: UNEP : Emission Gap Report 2021

Achieving GHG reductions while growing the economy is a global challenge

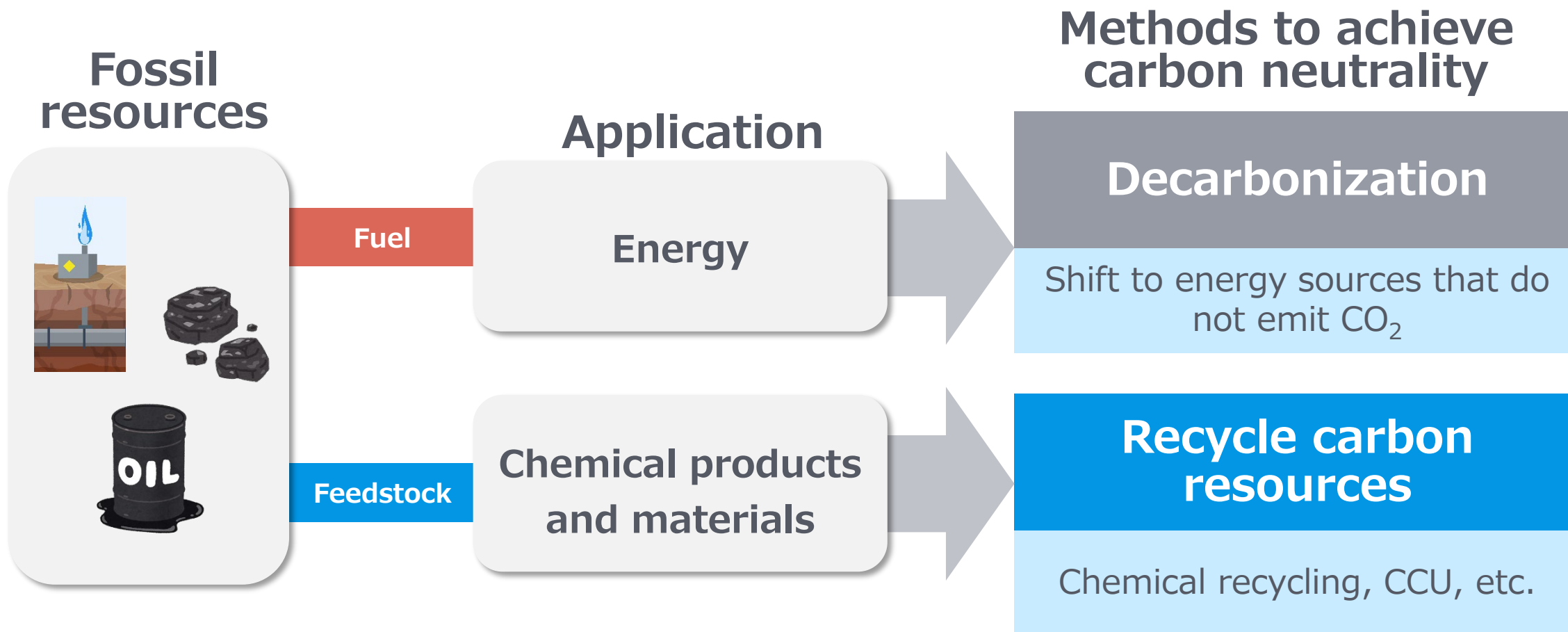


Creating shared value is important to achieving both economic growth and the resolution of social issues

“Our business must benefit ourselves and society as one and the same”

Approach toward carbon neutrality

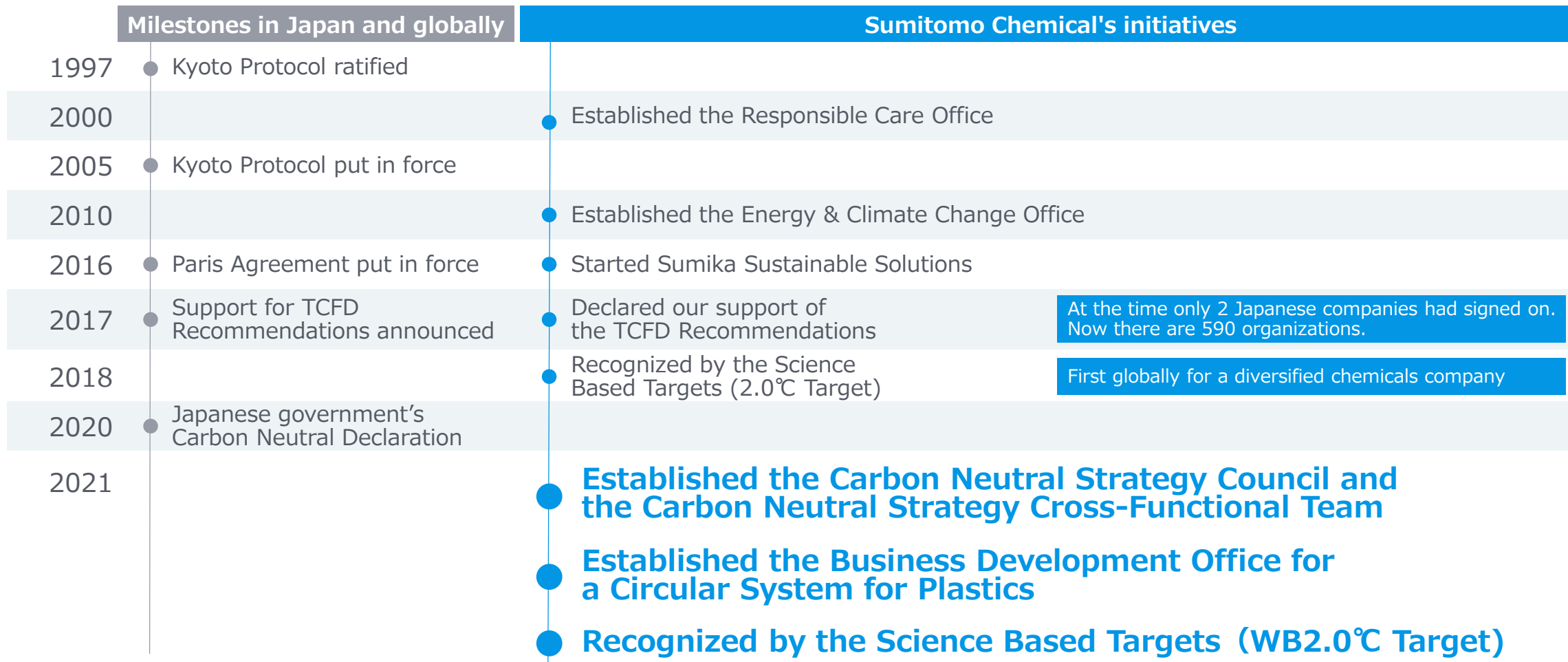
Fulfill a role where the chemical industry is uniquely positioned to handle carbon to achieve carbon neutrality



Grand design toward achieving carbon neutrality

Track record of our efforts to address climate change

We have taken the initiative to address climate change by establishing dedicated organizations, declaring our support for TCFD and acquiring SBT certification, among other things



Sumitomo Chemical aims to become carbon neutral by 2050

Obligations

Approach zero greenhouse gas emissions for the Sumitomo Chemical Group

Contributions

Reduce global greenhouse gas emissions through our group's products and technologies

Fulfill both obligations and contributions to strive to become carbon neutral
the Sumitomo Chemical Group way

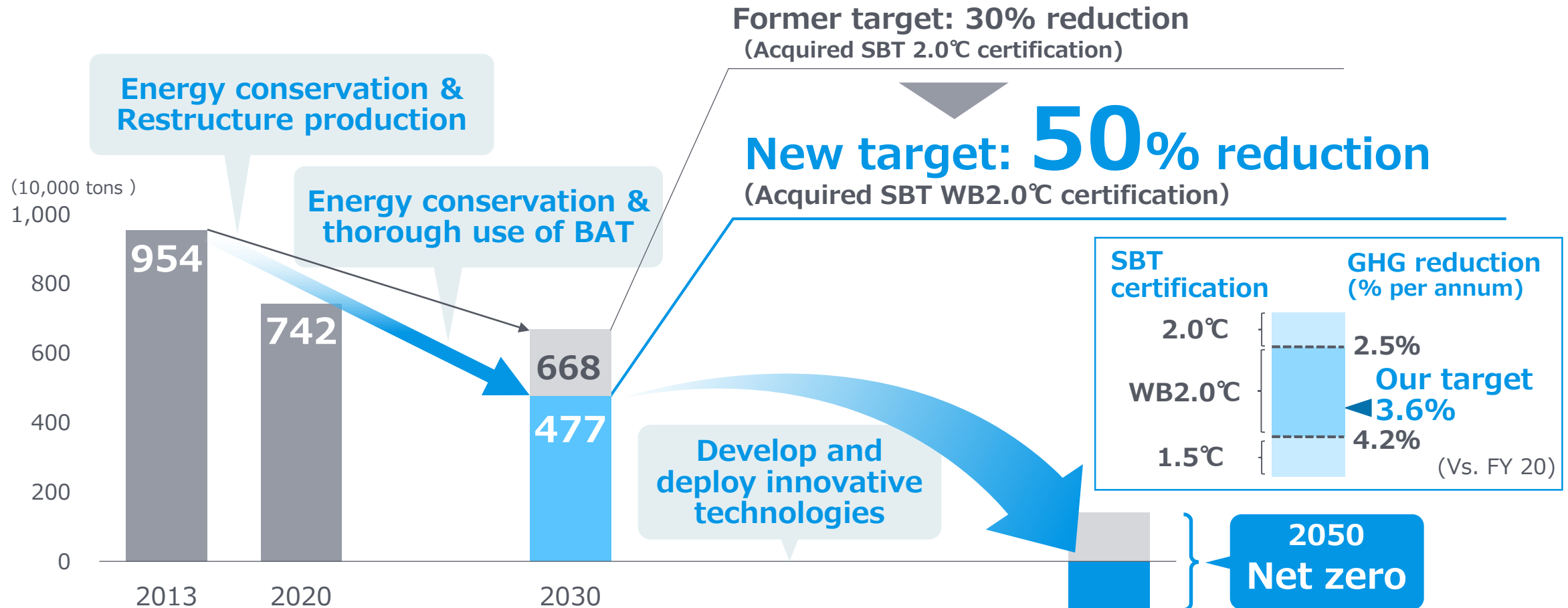
Greenhouse gas emissions at the Sumitomo Chemical Group

50% Reduce by **2030**

Reach net zero by **2050**

Sumitomo Chemical Group: Sumitomo Chemical + domestic and overseas subsidiaries. 50% vs. FY 2013 levels.

Raised our targets for reducing GHG and applied for a new SBT certification



Sumitomo Chemical Group: Sumitomo Chemical + domestic and overseas subsidiaries. 50% vs. FY 2013 levels.

● Getting to a 50% reduction by 2030

Aim to achieve targets to reduce GHG emissions based on what we can do ourselves

To date
Moving forward

- Strengthened the competitiveness of and restructured Chiba Works and Ehime Works
- Set science-based targets (SBT certification)
- LNG power plant at Ehime Works (Under construction)
- High-efficiency gas turbine power generation facilities at Chiba Works (Under construction)
- Other energy conservation measures, including fuel conversions and BAT maximization

● Getting to a net zero by 2050

- Convert to CO2-free energy
- Electrify plants. Develop and rapidly deploy innovative manufacturing process technologies
- Deploy circular carbon technologies (material and chemical recycling)
- Develop carbon-negative and CCU technologies

Contribute to GHG reductions in society through products and technologies from the Sumitomo Chemical Group

Work with a variety of stakeholders to be the first to deploy into society products and technologies that contribute to global greenhouse gas reductions

Three perspectives

Provide products and solutions that contribute to carbon neutrality

- Provide proprietary manufacturing technologies and products that contribute to GHG reductions
- Build a structure to evaluate carbon footprints

Drive the development of technologies that contribute to carbon neutrality and their rapid deployment into society

- Build a carbon resources recycling system
- Develop low-GHG emitting process technologies in membrane-based separation and wastewater treatment.

Take on long-term challenges including the development of carbon negative technologies

- Develop carbon negative technologies
- Develop CCU technology

Licensing technologies that lead to GHG reductions is a key factor in achieving both economic growth in emerging countries and carbon neutrality

Manufacturing technology

Propylene oxide On-purpose process

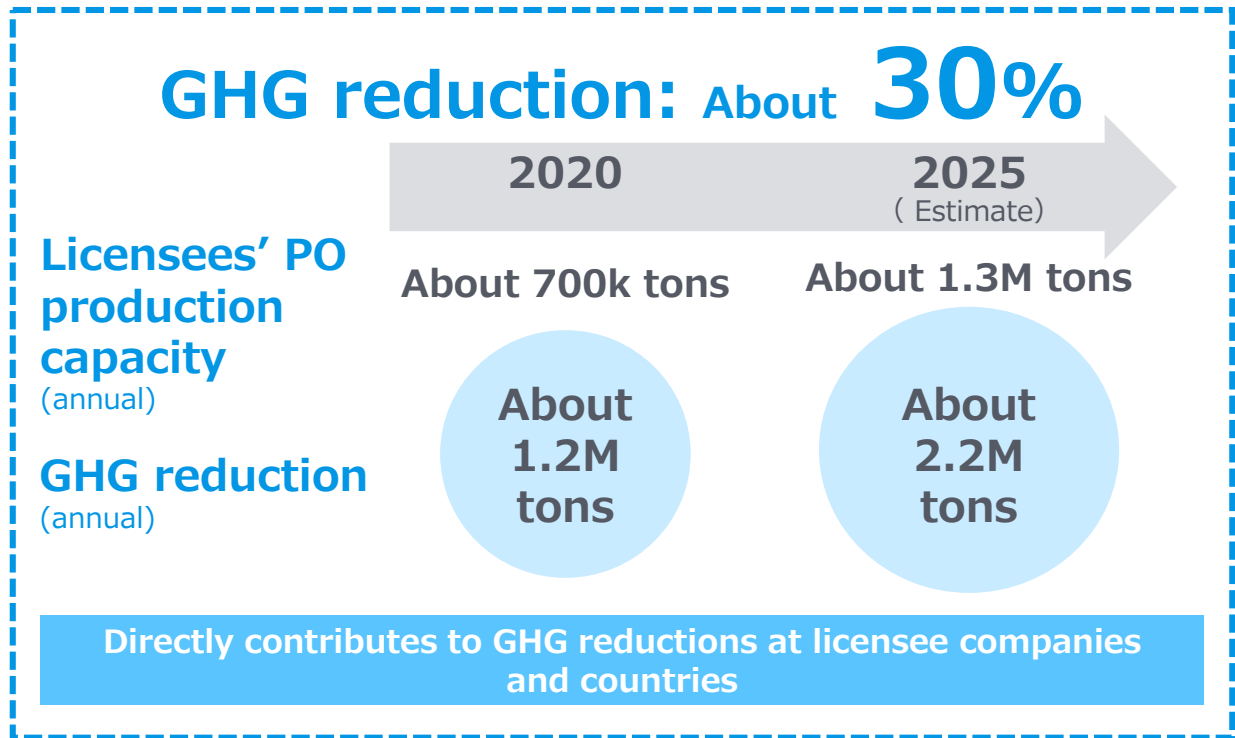
Application:

Feedstock for polyurethane used in automobile seats and heat insulation materials, etc.

Characteristics of the technology:

Achieve high yield, energy conservation and high operational stability by combining with a proprietary high-performance catalyst. Results in no by-products.

Awards: Won the Grand Prize in the 52nd Annual (2020) JCIA Technology Awards



Size of investments aimed at becoming carbon neutral

Expect to **invest 200 bn. yen** to become carbon neutral

By 2021

80 bn. yen

(Already decided or executed)

- Rebuild production structures at Chiba and Ehime Works
- Plant energy conservation measures
- Fuel conversions from coal and heavy oil to LNG

By 2030

120 bn. yen

(To be studied)

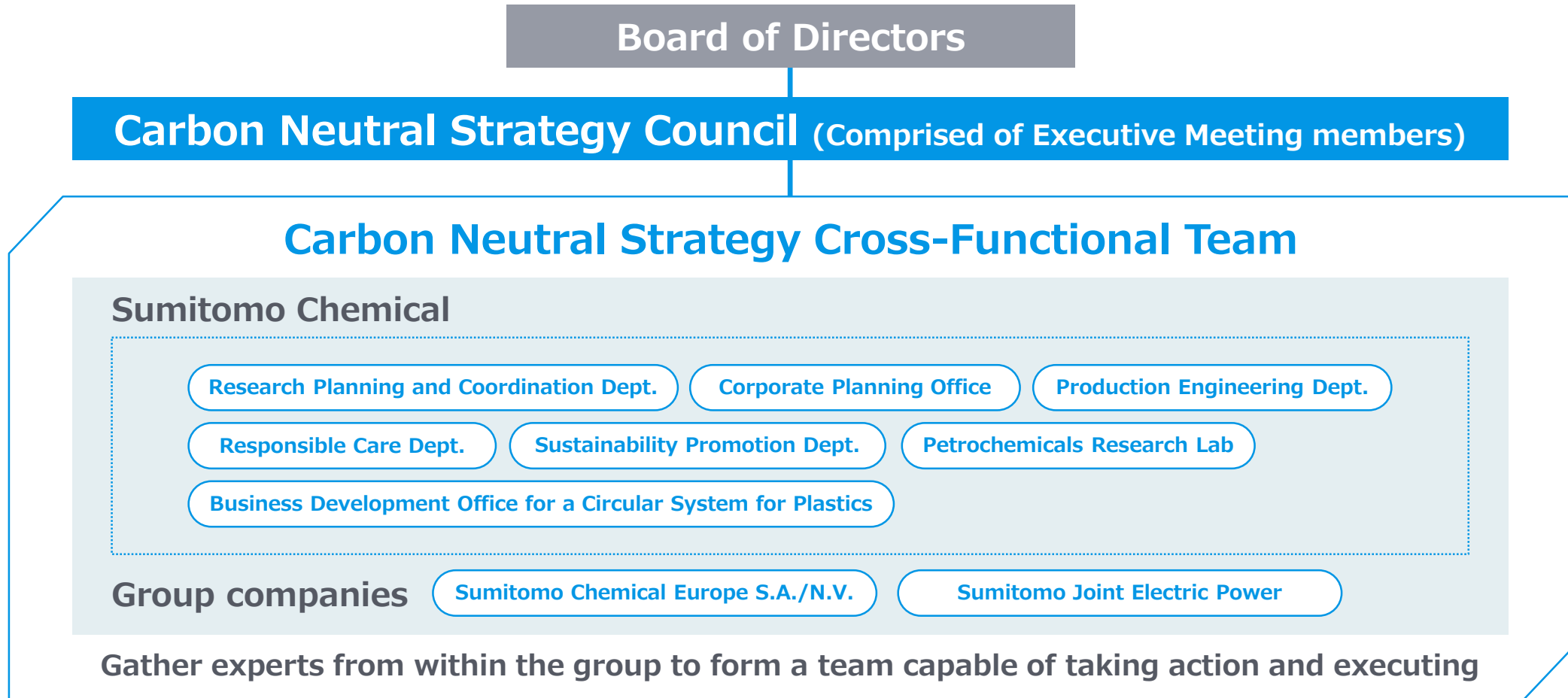
- Energy conservation measures and production equipment upgrades at plants
- Chemical recycling of plastic resources
- CO2 separation, CCU and others

2013

Since FY2019, business investments factor in an:
Internal carbon pricing system

Make investment decisions based on economics calculations that reflect an internal carbon price of 10,000 yen per ton


Built an organizational structure dedicated to advancing carbon neutrality under the supervision of the Board of Directors



External evaluations, Social and Governance highlights and direction moving forward

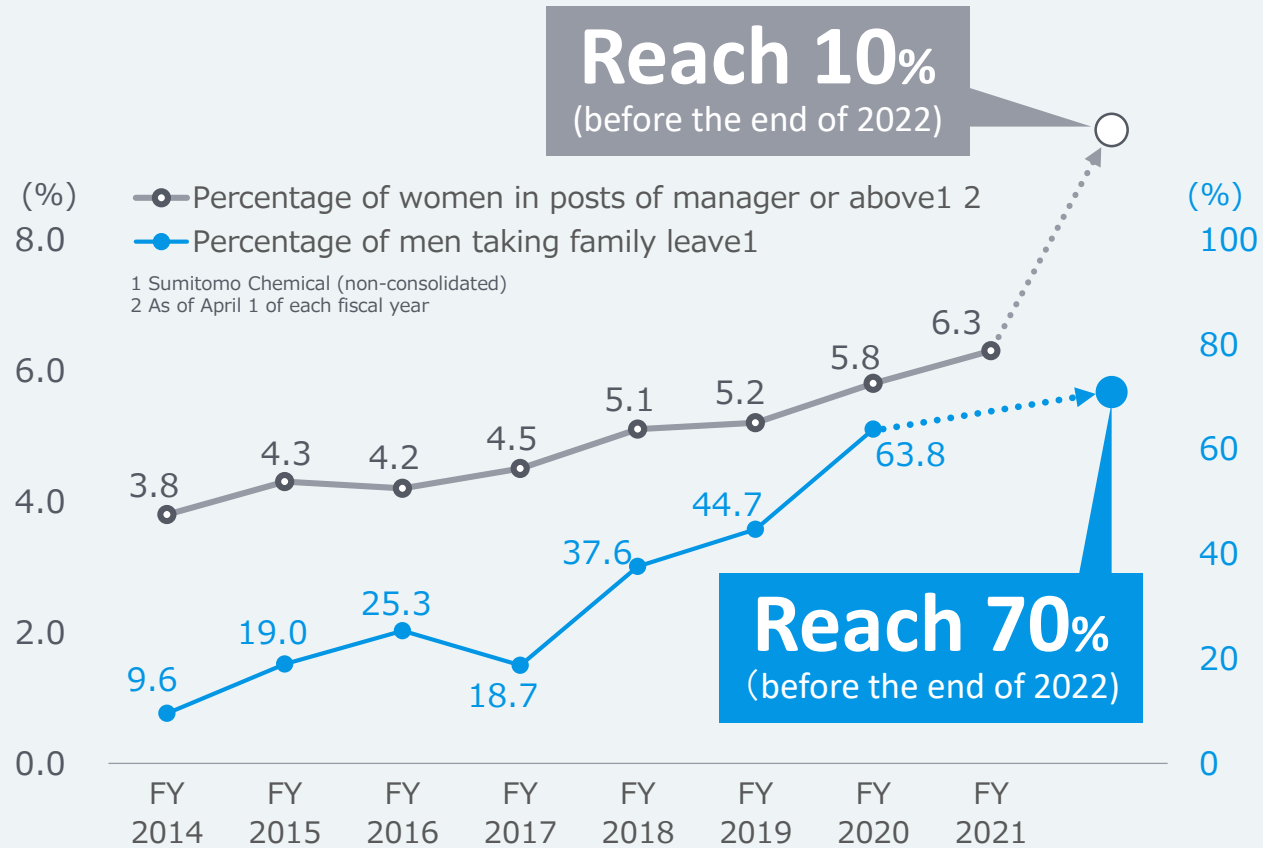
ESG-related external evaluations

Maintaining high marks among external evaluations.
Continue to establish a cycle of sustainability efforts, information disclosure and external evaluations.

		2018	2019	2020	2021	Remarks
	CDP Climate Change	A	A	A	A	Highest rating: A
	CDP Water Security	B	A-	A	A	Highest rating: A
	FTSE Blossom Japan Index	4.0	4.2	4.2	December (TBD)	5 is a perfect score
MSCI	MSCI Japan ESG Select Leaders Index	AAA	AAA	AAA	AAA	AAA is the top rating
MSCI	MSCI Japan Empowering Women Index (WIN)	6.2	6.0	6.7	6.9	10 is a perfect score
	Ecovadis Sustainability Ratings					Gold is the top 5% level.

➔ Social

Results from D&I initiatives



More women in manufacturing settings

- Prepare physical infrastructure for women such as rest rooms and changing rooms
- Seed awareness of various workplaces during orientation training
- Follow up with employees after they have joined the company (e.g., regularly scheduled interviews and internal networking events for women)

➔ Stable supply of talented workers
Increased competitiveness in mfg



➔ Governance

Sustainability Promotion Committee

Major themes (from October 2021)

- Update global trends related to sustainability
- Carbon Neutral Strategy
- Circular System for Plastics KPIs
- Initiatives across the value chain (human rights and the environment)
- Activity for our group to penetrate sustainability
- Engagement with and announcement to Stakeholders, and others.

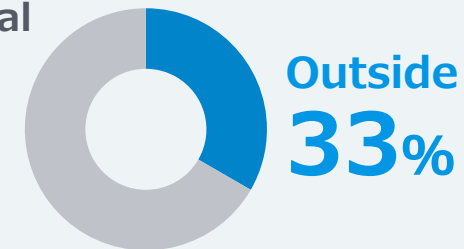
Beginning this year, participation expanded to include outside directors and corporate auditors to encourage lively discussions

About parent-subsidary listings

- Disclosed our thinking in the Sumitomo Chemical Report 2021
- Engaged collaboratively with institutional investors regarding this topic

Percentage of outside directors

FY 2021 Actual
Total: 12



Contribute to the sustainable growth of our corporate group as well as the realization of a sustainable society

FY 2022-2024

FY 2019-2021

Change & Innovation



Next Corporate Business Plan

Advance an upgrade of the business portfolio centered around green transformation (GX)

		Area of focus
Petro chemicals & Plastics	Contribute to realizing a recycling society	Chemical recycling
High-performance materials	Contribute to realizing Society 5.0 and next-generation energy systems	5G and EV materials
Life sciences	Contribute to preservation of the ecosystem and promotion of health	Biorationals

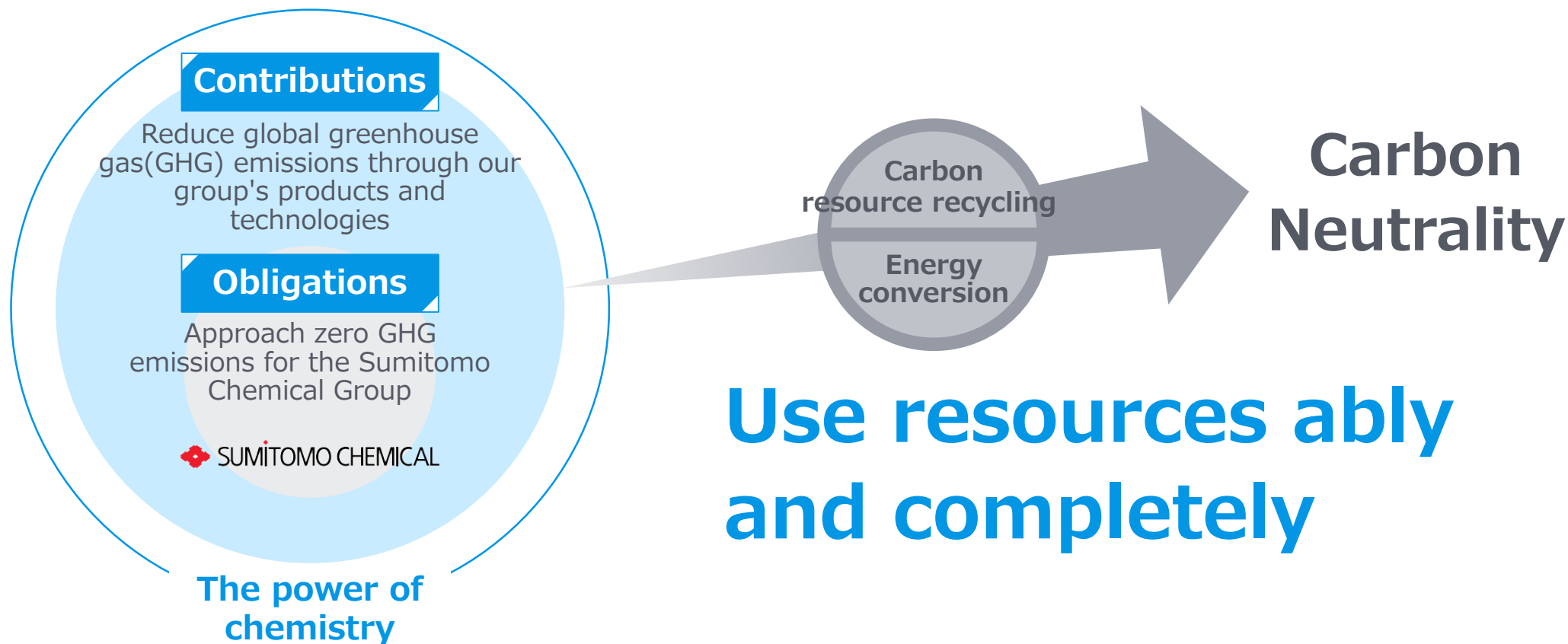
Section.

2

Carbon Neutral Grand Design

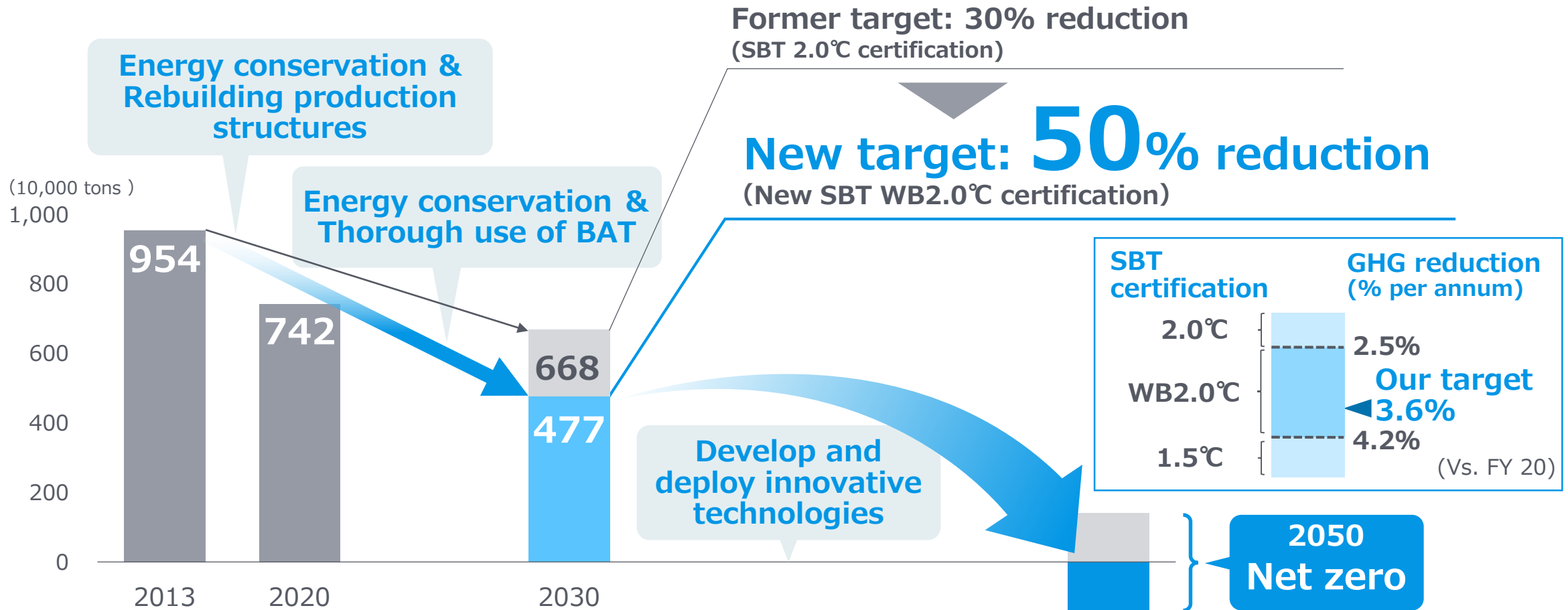
- **Sumitomo Chemical's aspirations for carbon neutrality** **1**
- **Initiatives for obligations** **2**
- **Initiatives for Contributions** **8**

Achieve carbon neutrality globally with our excellent technologies and products



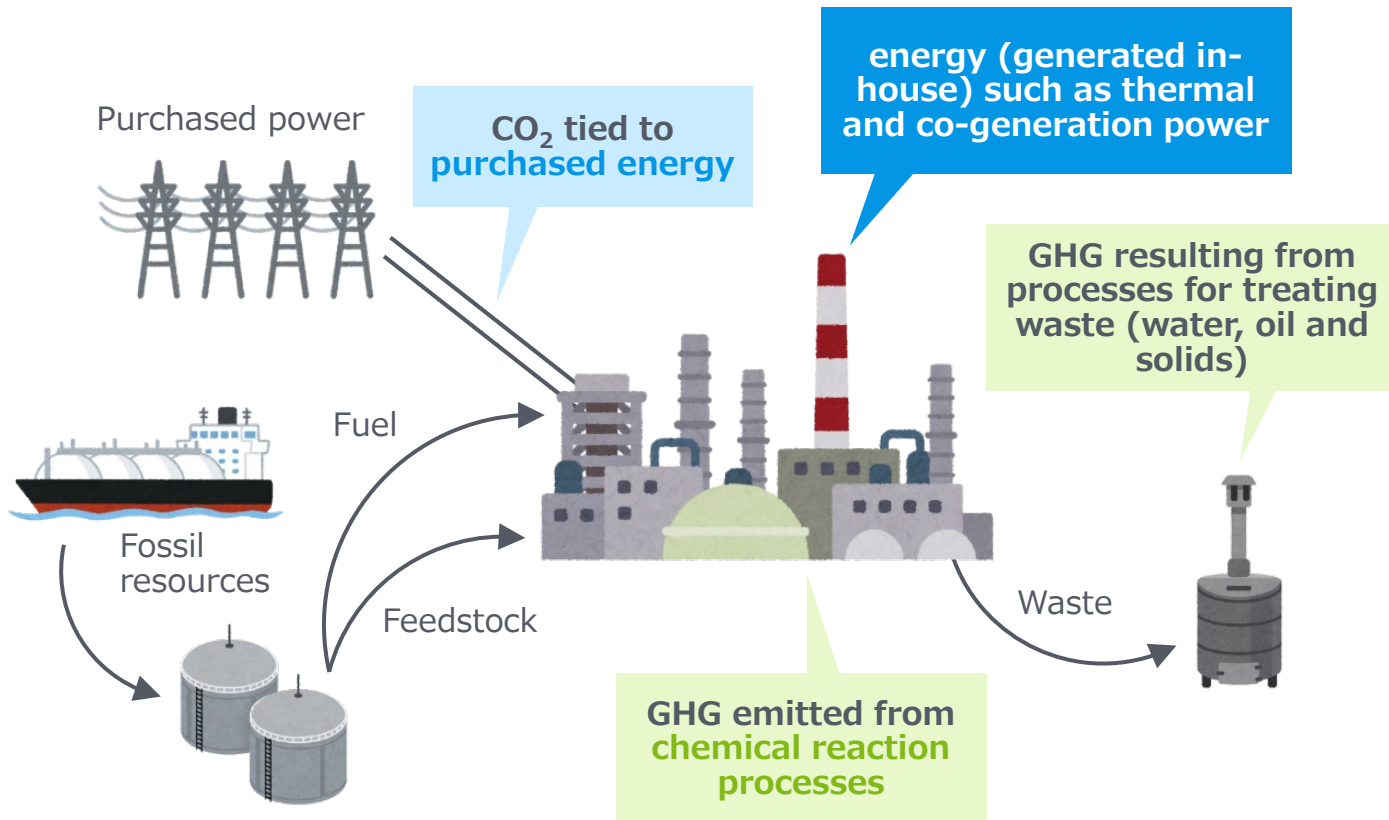
Initiatives for obligations

Raised our targets for reducing GHG and applied for a new SBT certification

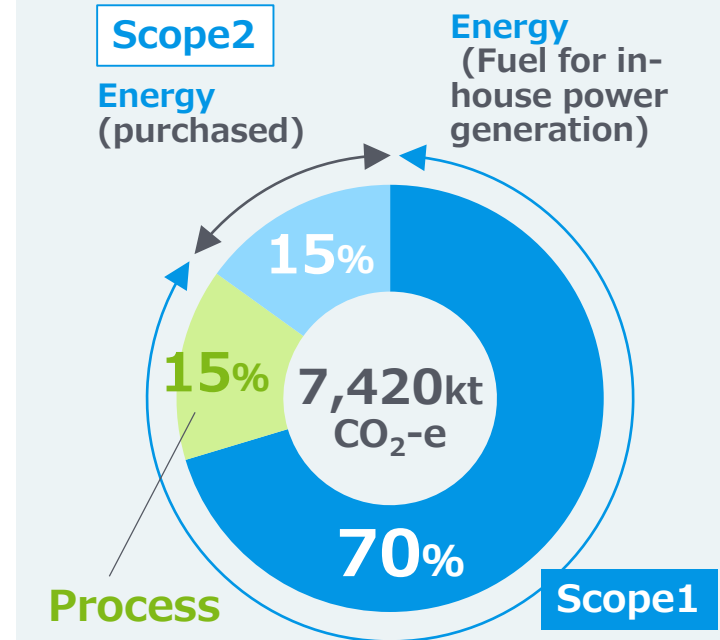


Sumitomo Chemical Group: Sumitomo Chemical + domestic and overseas subsidiaries. 50% vs. FY 2013 levels.

Convert to clean energy to address GHG derived from **energy sources** and focus on the necessary technological development for GHG derived from **processes**



GHG emissions in 2020



Begin studying the introduction of clean fuels to become carbon neutrality by 2050

Natural gas

	Ehime	Chiba
Fuel	Coals and heavy oil ▶ LNG	Petroleum coke ▶ LNG
Amount of CO ₂ reduction	650k tons/year	240k tons/year



Building an LNG tank, the largest of its kind in Japan, on the premises of Ehime Works

Clean fuels



- Study acquiring clean ammonia

World's leading Ammonia manufacturer



住友化学
SUMITOMO CHEMICAL

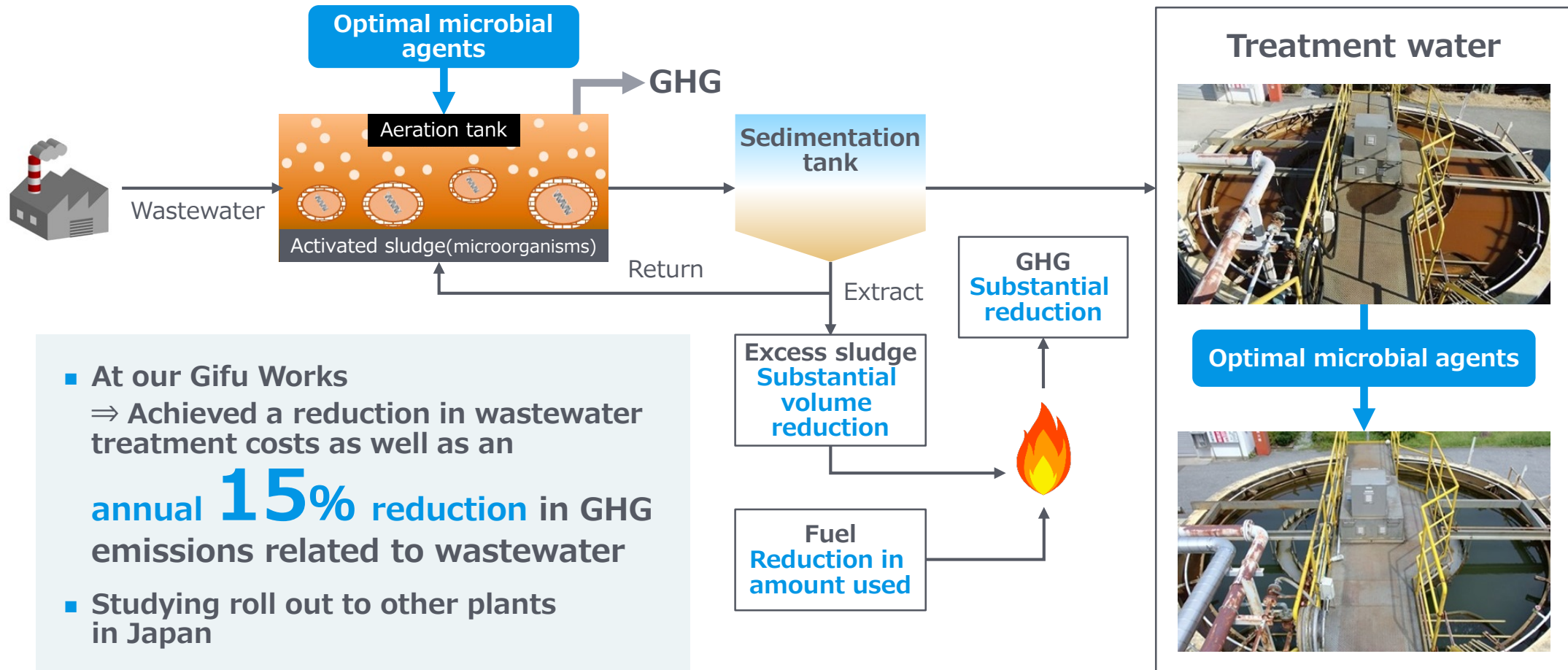
(Studying working with other companies, too.)

- Coordinated studies on a carbon neutral port concept (Shikoku, Niihama, etc.)



(MLIT: <https://www.mlit.go.jp/common/001408123.pdf>)

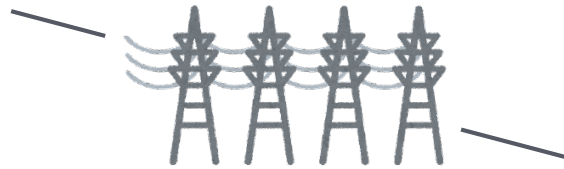
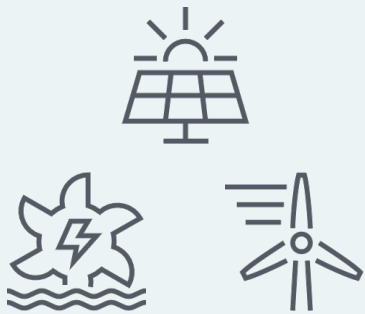
Reduce GHG emissions resulting from wastewater treatment and the volume of waste to be incinerated by leveraging biotechnology to use microbial agents optimized for wastewater treatment



- At our Gifu Works
⇒ Achieved a reduction in wastewater treatment costs as well as an **annual 15% reduction** in GHG emissions related to wastewater
- Studying roll out to other plants in Japan

At Oita Works, switched 100% of purchased power to renewable energy sources

Power from renewable energy



Oita Works



At Oita Works

- Reduced GHG 20% by switching all purchased power to **100% renewable energy**
- Reduced GHG 10% by **converting fuel** (from heavy oil to utility gas)

Reduced GHG by a
total of **30%**

(Reduction rate : Compared to fiscal 2013)

Initiatives for Contributions

Contribute to GHG reductions in society through products and technologies from the Sumitomo Chemical Group

Work with a variety of stakeholders to be the first to deploy into society products and technologies that contribute to global GHG reductions

Three viewpoints

Viewpoint 1

Provide products and solutions that contribute to carbon neutrality

Viewpoint 2

Drive the development of technologies that contribute to carbon neutrality and their rapid deployment into society

Viewpoint 3

Take on long-term challenges including the development of carbon-negative and other technologies

Promote adoption of licensing of our proprietary chemical product manufacturing technologies and provide innovative products

Manufacturing technologies

Propylene oxide production technology: On-purpose PO process

- **Proprietary on-purpose propylene oxide process** that uses cumene as a reaction medium and a high-performance epoxidation catalyst

(Won the Grand Prize in the 52nd Annual (2020) JCIA Technology Awards)

- **Reduces GHG about 30%**

(Comparisons to other manufacturing methods are based on our estimates)

- Currently expanding licensing overseas: Licensee production capacity estimated to reach 1.3M tons/year by 2025

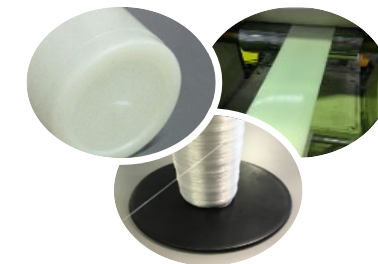
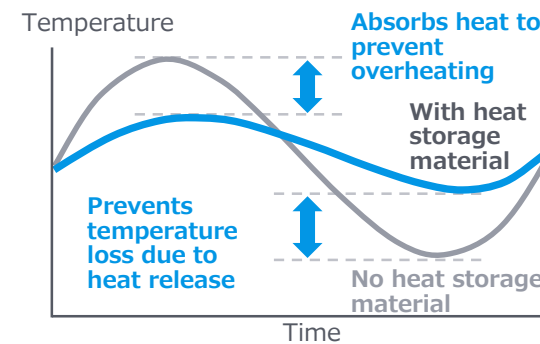
That would **reduce GHG by About 2.2M tons/year**



Materials

Heatorage / Conformer

Resin heat storage material that maintains its form as a solid



Can be molded into a variety of shapes

Applications



High-performance construction materials



Functional bedding

Sumika Sustainable Solutions :

Designate the Group's products and technologies that contribute to addressing climate change and the reduction of environmental impact over the product's entire life cycle and promote their development and widespread use

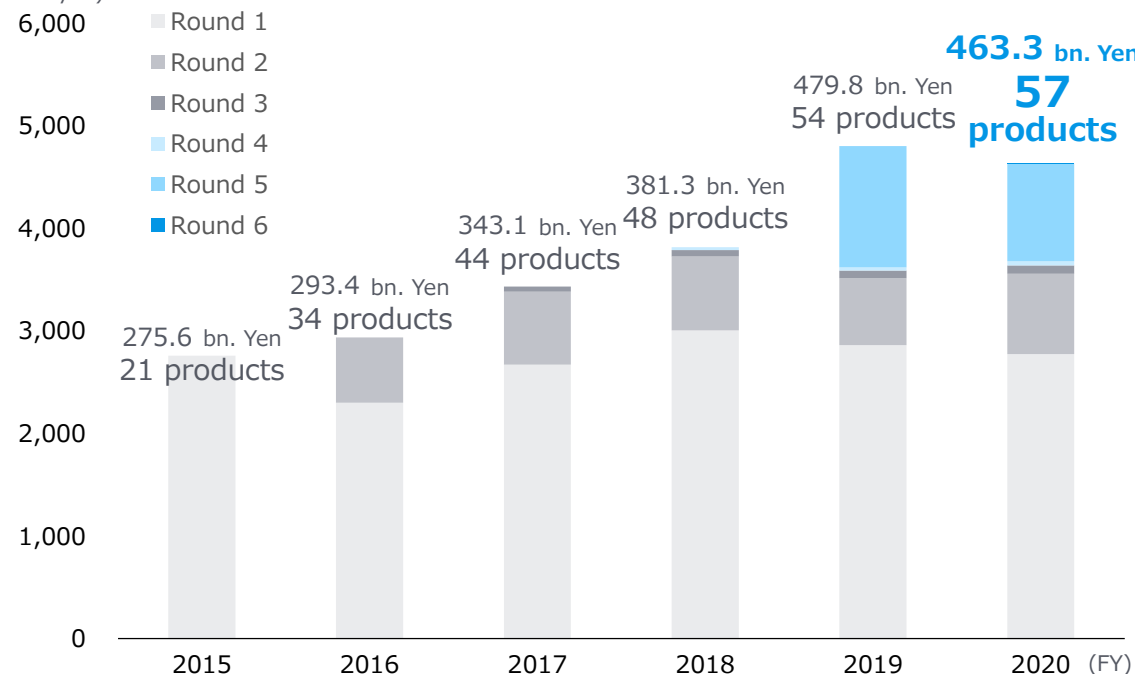


Sumika
Sustainable
Solutions

Targets

560.0 bn. yen by 2021

(Billions of yen)



Manufacturing
technologies

10 technologies

- On-purpose propylene oxide process
- Hydrochloric acid oxidation process
- UV adhesion process (polarizing film)

Materials
products

47 products

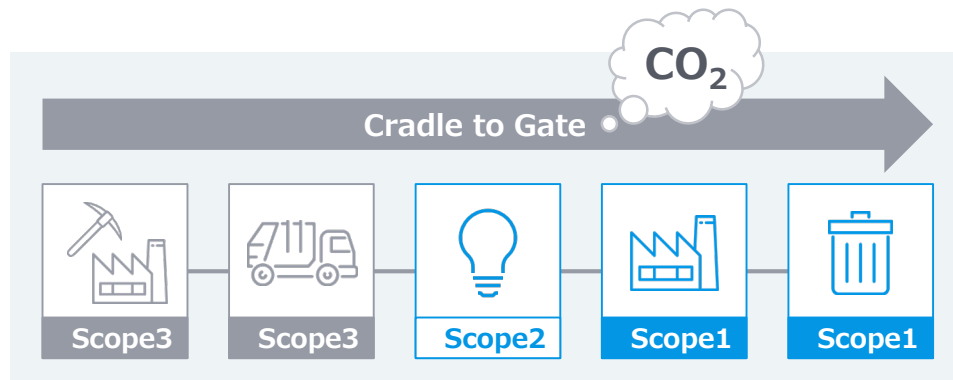
- Li ion battery materials
Separators, cathodes
- Resin products
Heatorage / Conformer
Temperature-sensitive agricultural film
TPE for non-coated air bag covers, etc.
- Feed additives
Methionine etc.

Speed up the calculation of the carbon footprint of our products leveraging a proprietary calculation tool

Developed a proprietary automatic calculation tool for our products' carbon footprint

Features

- Built based on commercially available software (Microsoft Access/Excel)
- Prepared multiple calculation models accounting for the characteristics of chemical manufacturing processes (co-products, by-product fuels, steam generation, etc.) (Choose from the pull-down menu of models and execute calculation)
- Can easily calculate carbon footprint for each stage (intermediates or final product). E.g., raw material to Intermediate A to Intermediate B ... to final product.



Plan to complete evaluating the carbon footprint of all our products (about 20,000) by the end of December 2021

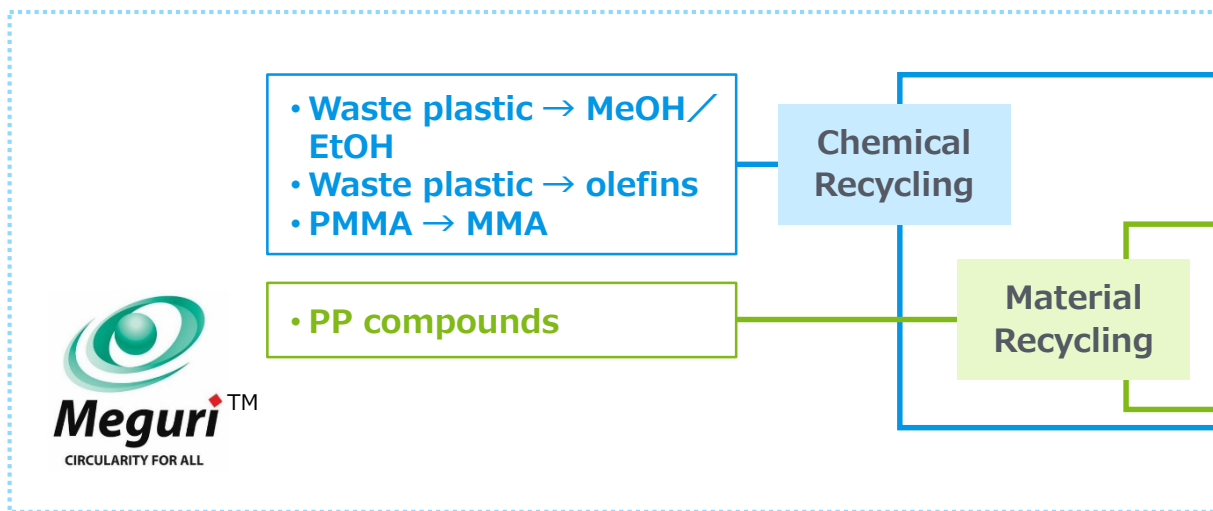
(Perform evaluation from Cradle to Gate on products where carbon footprint data is available for raw materials and Gate to Gate where such data is not readily available)

Began carbon footprint evaluation of group company products. Plan to complete evaluation by the end of FY 22.

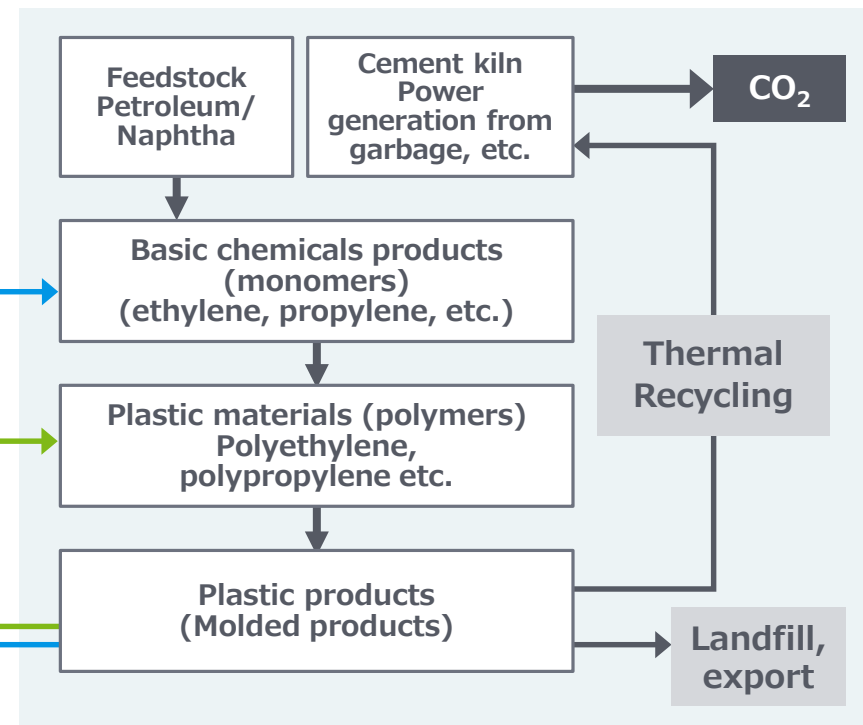
Plan to provide this automated calculation tool to other companies outside the group free of charge

Build a circular system for plastics by developing and deploying into society recycling technologies

Consider plastics to be carbon resources and build a recycling system as our brand



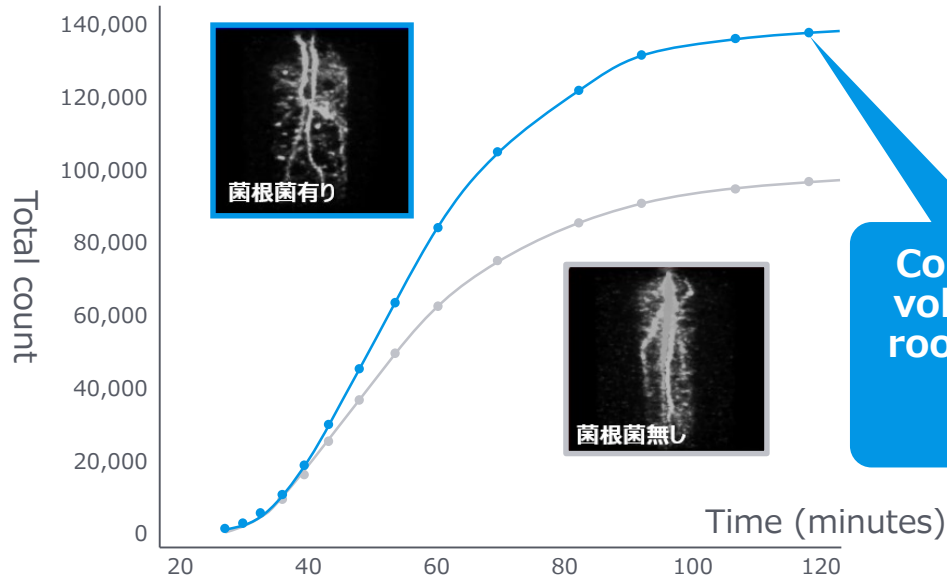
Life cycle of plastic materials



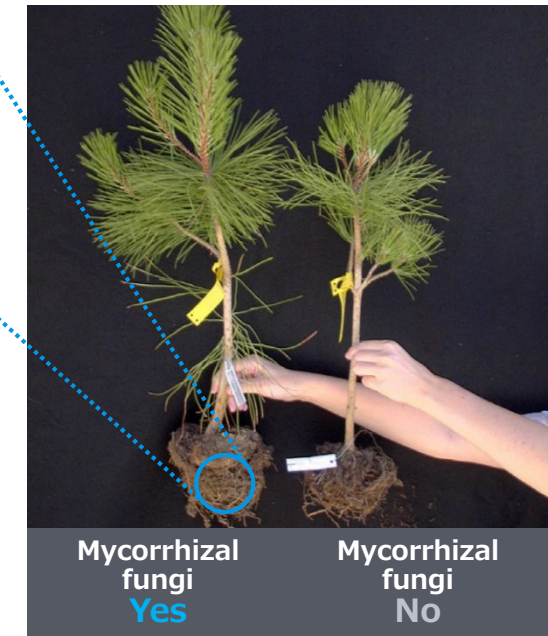
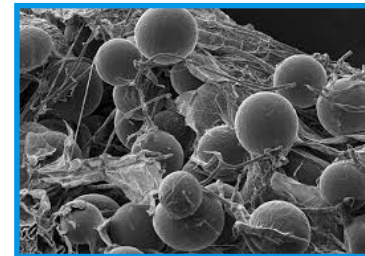
Direct Air Capture & Storage of CO₂ leveraging the power of organisms

- Mycorrhizal fungi: A type of useful microorganism that inhabits the soil. **They penetrate the roots of plants and coexist with their hosts (plants)**
- They coexist by giving their host plants nutrients such as phosphoric acid and nitrogen and from their hosts **receive carbon compounds produced through photosynthesis. The growth of many plants is boosted by coexistence with mycorrhizal fungi.**

Image of the transfer to roots of carbon (C¹¹) absorbed from leaves
(XRT-Positron Emission Tomography)



Confirmed an increase in the volume of solid carbon in the root system (in soil) of plants due to coexistence with mycorrhizal fungi



(Joint research with The Donald Danforth Plant Science Center, Washington Univ.)

Leveraging mycorrhizal fungi to lock in carbon solids into the soil and thus fertilize the soil to achieve carbon neutrality and resolve food shortages

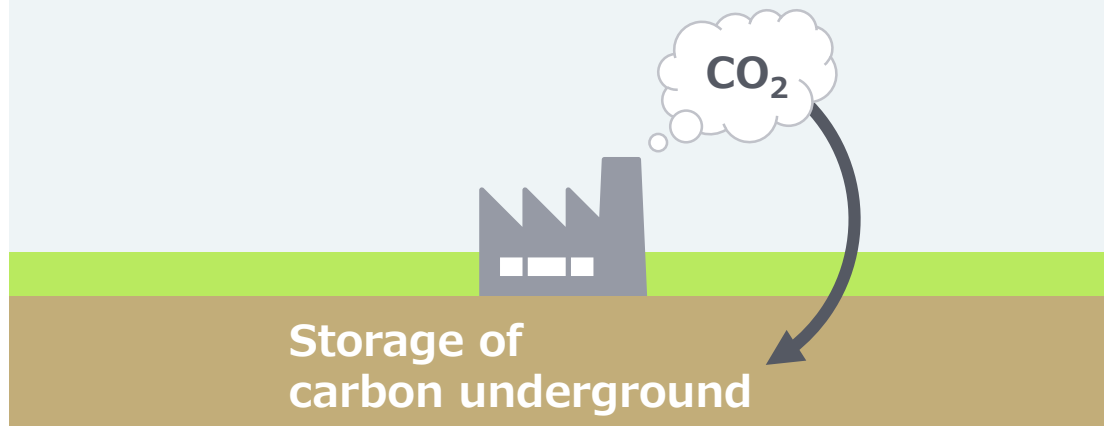
Mycorrhizal fungi

Coexistence with plants:

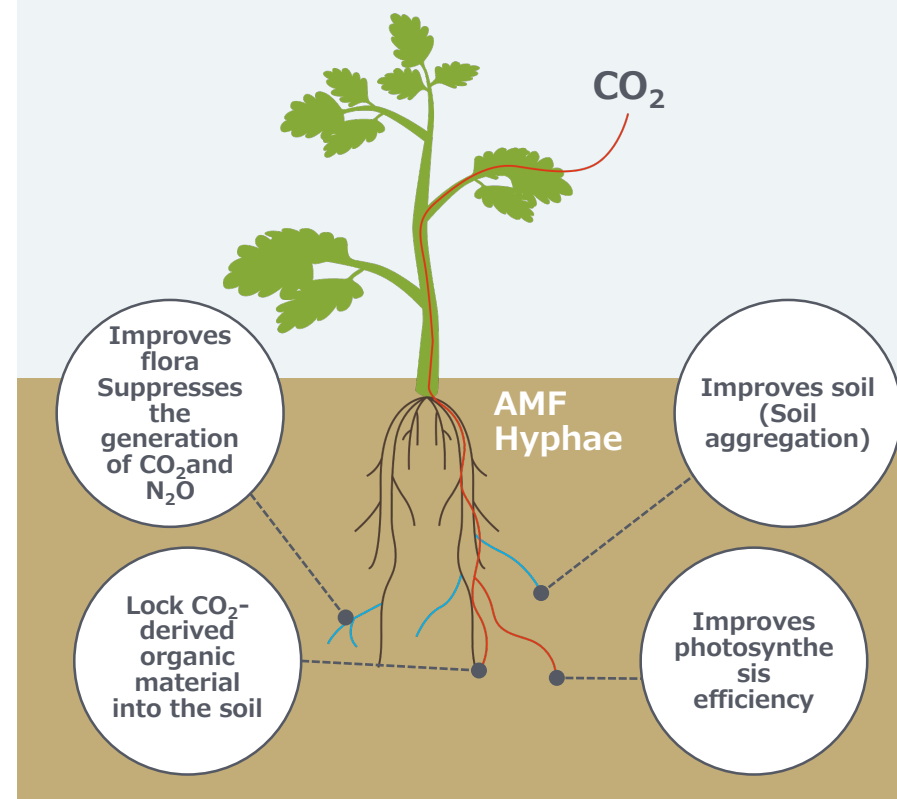
- Promotes the locking in of carbon through photosynthesis
- Locks carbon into the soil and by doing so fertilizes the soil

Direct Air Capture & Storage of CO₂ leveraging the power of organisms

"EcoDAC™"

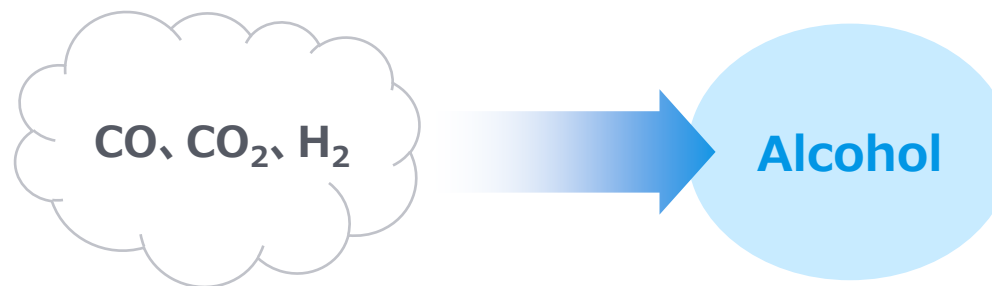


Benefits of mycorrhizal fungi (including some hypotheses undergoing validation)



Sosa-Hernández et al. (2019) modified

Development of innovative manufacturing technology to synthesize from CO₂ the alcohol used to make basic chemical products



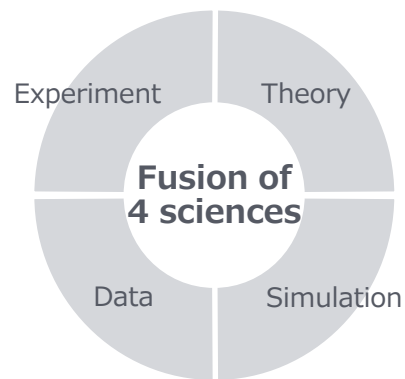
Catalyst development



京都大学
KYOTO UNIVERSITY



住友化学
SUMITOMO CHEMICAL



Catalyst Informatics

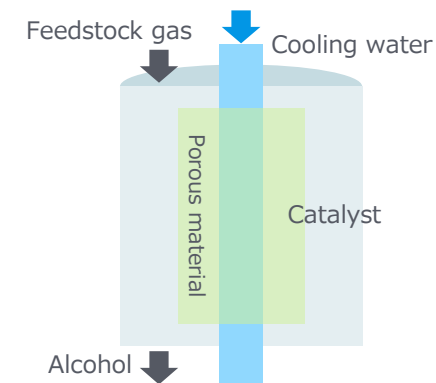
Process development



国立大学法人
島根大学



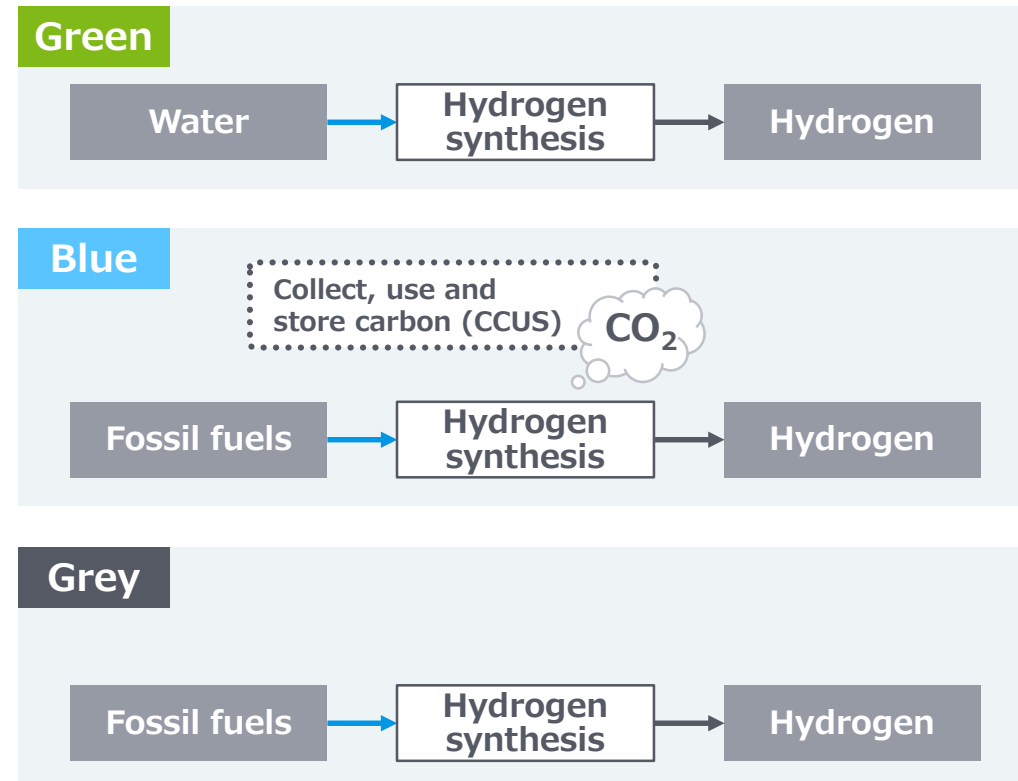
住友化学
SUMITOMO CHEMICAL



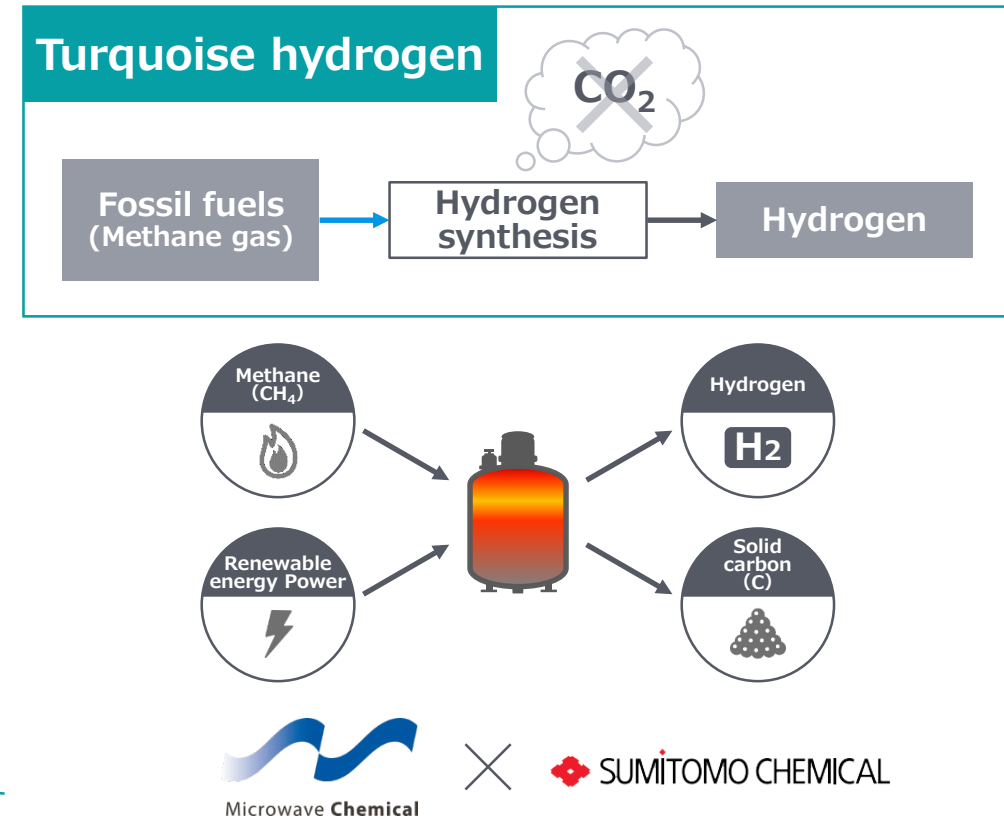
Internal Condensation Reactor

Manufacture clean hydrogen using the greenhouse gas methane as a feedstock

Feedstock and method of mainstream hydrogen synthesis



Feedstock and method of our hydrogen synthesis (under development)



Work with a variety of partners to lead the deployment into society of products and technologies that contribute to GHG reductions and achieve carbon neutrality globally

Provide products and solutions that contribute to carbon neutrality

License out manufacturing technologies and provide innovative products

- Customer

Spread use of SSS-certified products

- Customer

Carbon footprint evaluation of products

- Customer
- Trade groups

Drive the development of technologies that contribute to carbon neutrality and their rapid deployment into society

Carbon Neutral

Take on long-term challenges including the development of carbon negative technologies

Build a resources recycling society

- Customer
- Upstream and downstream industries
- National and local governments

Develop and deploy manufacturing process technologies

- Customer
- Academia
- Startups

Carbon negative, CCU

- Academia
- Startups

Section.

3

Initiatives toward a circular system for plastic resources

- KPIs for a Circular System for Plastics 1
- Overview of plastics recycling 2
- Efforts for 3Rs-Reducing, Reusing and Recycling 3
- Commercialization of materials recycling 4
- Commercialization of chemical recycling 5
- Share value through the Meguri brand 7

Advance efforts to contribute to circular systems for resources, the development of recycling technologies and their deployment into society

KPI: The amount of recycled plastics used in manufacturing processes

Drive adoption of technologies for reducing environmental impact and advance circular systems for carbon resources



Materials recycling initiatives

Pretreatment, melting and kneading, forming of pellets and reuse of used products

- Study technological alliances with companies on the return end of the cycle
- Commercialization of recycling for automotive components, etc.

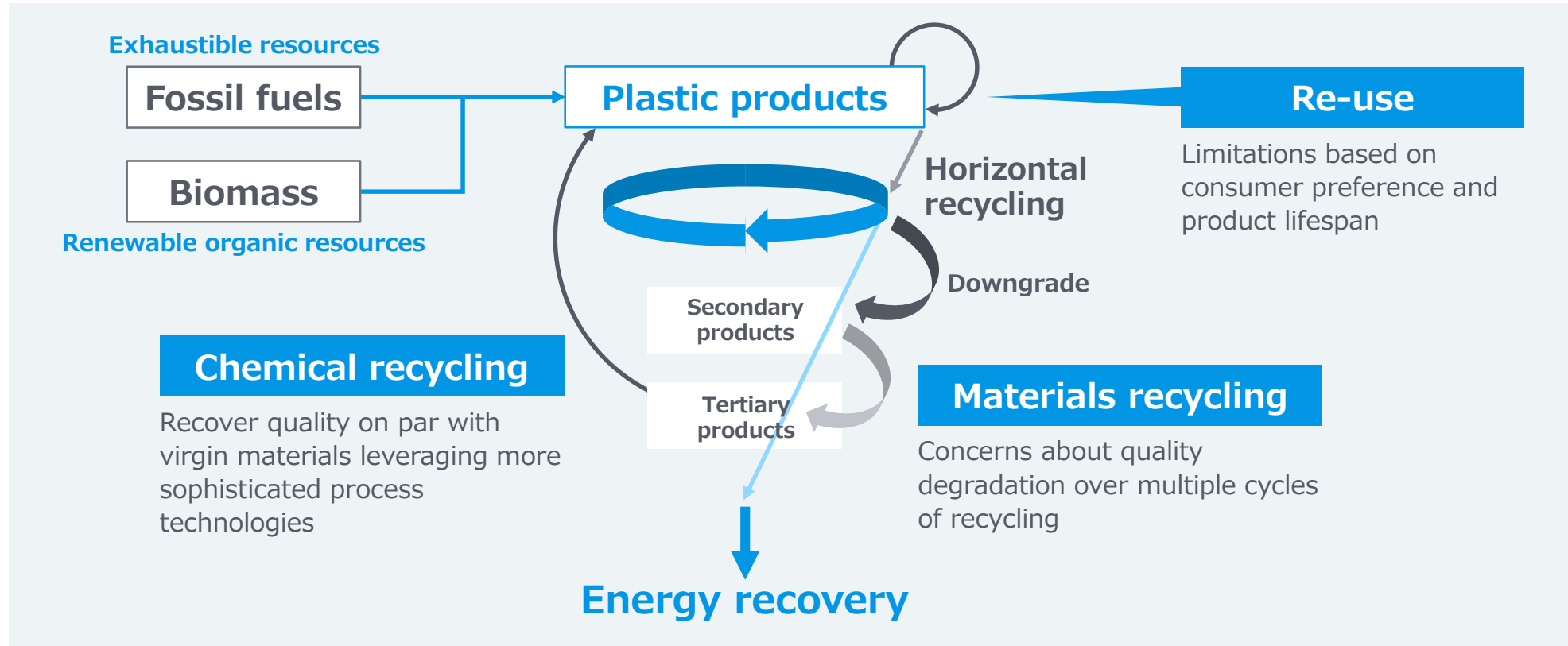
Chemical recycling initiatives

Chemically react and break down waste, convert it to feedstock or monomers and reuse

- Reuse resources derived from waste
- Develop technologies to synthesize alcohols from CO₂

Need to leverage the optimal recycling methods to reuse resources in a circular society

➔ Plastics recycling methods



Strive to deliver lighter weight and higher performance with plastic products while designing environmentally friendly products

	Examples		Features/Performance														
Reduce	<p>Refill Pouch</p> <p>Lighter and stronger than bottles</p> <p>offers higher transportation efficiency</p>		<table border="1"> <tr> <td rowspan="2">Environmental friendliness</td> <td>Weight of packaging materials (g) per 100g of contents</td> <td>Bottle: 19</td> <td>Large Refill Pouch: 1.8</td> </tr> <tr> <td>Transportation efficiency</td> <td>△</td> <td>○</td> </tr> <tr> <td>Utility value</td> <td>Bag drop strength</td> <td>△</td> <td>○</td> </tr> </table>	Environmental friendliness	Weight of packaging materials (g) per 100g of contents	Bottle: 19	Large Refill Pouch: 1.8	Transportation efficiency	△	○	Utility value	Bag drop strength	△	○			
	Environmental friendliness	Weight of packaging materials (g) per 100g of contents	Bottle: 19		Large Refill Pouch: 1.8												
Transportation efficiency		△	○														
Utility value	Bag drop strength	△	○														
Reuse	<p>Returnable Box</p> <p>Made of foamed polypropylene sheets and can be used repeatedly</p> <p>offers higher environmental-friendliness, and is superior in water resistance, load capacity and cleanliness.</p>		<table border="1"> <tr> <td rowspan="3">Environmental friendliness</td> <td>Number of times one unit of the product can be used</td> <td>Cardboard Paper Box: 1</td> <td>Returnable Box Expanded PP Sheet: 50</td> </tr> <tr> <td>Consumption of packaging materials (kg/year)</td> <td>24.9 (equivalent to 50 sheets)</td> <td>1.4</td> </tr> <tr> <td>Reusability</td> <td>×</td> <td>○</td> </tr> <tr> <td>Utility value</td> <td>Water resistance, load bearing, cleanliness</td> <td>×</td> <td>○</td> </tr> </table>	Environmental friendliness	Number of times one unit of the product can be used	Cardboard Paper Box: 1	Returnable Box Expanded PP Sheet: 50	Consumption of packaging materials (kg/year)	24.9 (equivalent to 50 sheets)	1.4	Reusability	×	○	Utility value	Water resistance, load bearing, cleanliness	×	○
	Environmental friendliness	Number of times one unit of the product can be used	Cardboard Paper Box: 1		Returnable Box Expanded PP Sheet: 50												
Consumption of packaging materials (kg/year)		24.9 (equivalent to 50 sheets)	1.4														
Reusability		×	○														
Utility value	Water resistance, load bearing, cleanliness	×	○														
Recycle	<p>Glass Fiber Reinforced Polypropylene Material</p> <p>Boasts properties high enough to replace virgin polypropylene, even though it contains as much as 60% by weight recycled polypropylene.</p> <p>Highly rated by users as a technology meeting circular economy policies</p>		<table border="1"> <tr> <th colspan="2">Environmental Contribution (FY2020)</th> </tr> <tr> <td>Reduction of virgin polypropylene use</td> <td>approx. 6,000tons/year</td> </tr> <tr> <td>Reduction of GHG emissions, as compared with the case of using virgin polypropylene</td> <td>approx. 15,800tons/year (CO2 equivalent)</td> </tr> </table>	Environmental Contribution (FY2020)		Reduction of virgin polypropylene use	approx. 6,000tons/year	Reduction of GHG emissions, as compared with the case of using virgin polypropylene	approx. 15,800tons/year (CO2 equivalent)								
Environmental Contribution (FY2020)																	
Reduction of virgin polypropylene use	approx. 6,000tons/year																
Reduction of GHG emissions, as compared with the case of using virgin polypropylene	approx. 15,800tons/year (CO2 equivalent)																

Commercialization of materials recycling

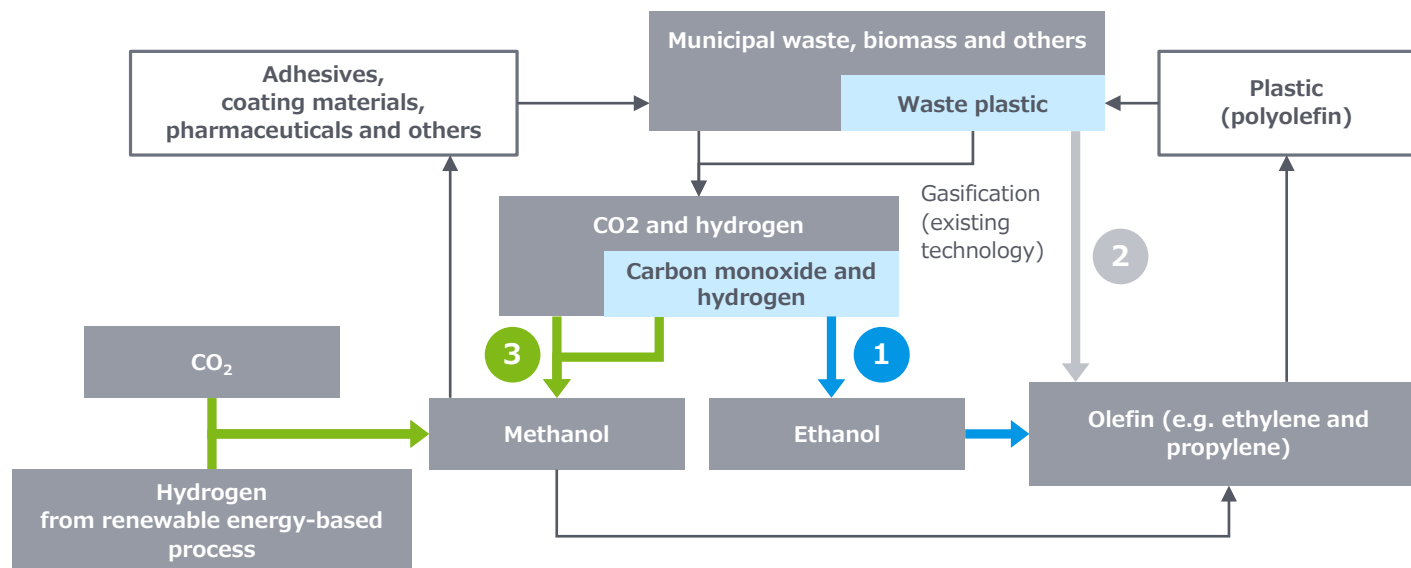
Deploy technologies to perform crushing, melting or other treatments on waste plastic resources to reuse the resources as a material input in a variety of applications

Working with Rever Group



Commercialization of chemical recycling

Deploy technologies to chemically treat recycled resources and waste plastic resources and convert them to other chemical substances for reuse



Our technical competence

1. Catalyst design technology
2. Chemical process design technology

Use plastic waste and other waste, instead of fossil fuel feedstock, to manufacture plastics

1 Initiative with Sekisui Chemical Co., Ltd.

Raw material Municipal waste, waste plastic and biomass

Product Polyethylene

2 Joint research with the Muroran Institute of Technology

Raw material Waste plastic

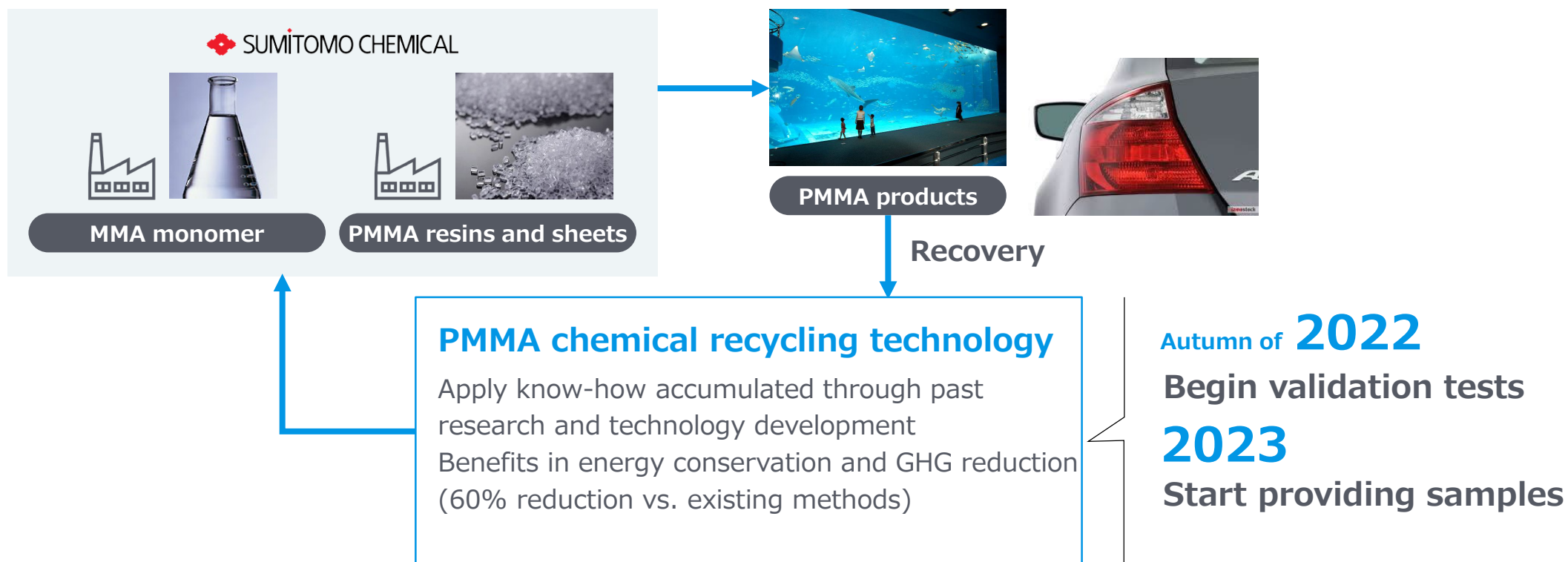
Product Ethylene, propylene and others

3 Joint research with Shimane University

Raw material Municipal waste, waste plastic and biomass

Product Methanol

⇒ Build a supply chain for PMMA chemical recycling



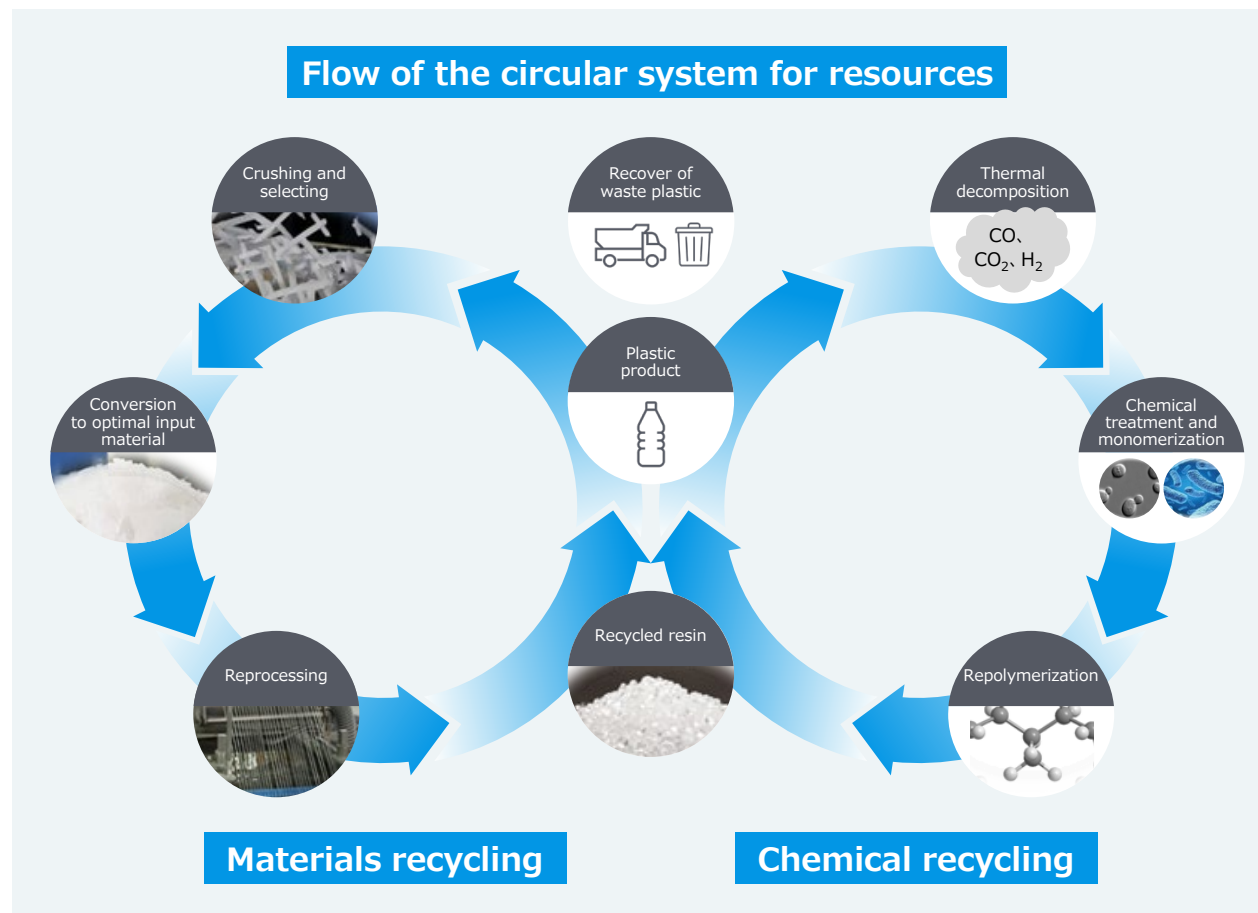
Efficiently recover and reuse waste plastic resources

Share value through the Meguri brand

The Meguri™ brand—a variety of recycled plastic products made using technologies for reducing environmental impact



Build a network for collaboration among customers, industry peers and municipalities while deploying the Meguri™ lineup of recycled plastic products. Drive broader adoption to contribute to reducing environmental impact (e.g., GHG emissions)



Cautionary Statement

Statements made in this document with respect to Sumitomo Chemical's current plans, estimates, strategies and beliefs that are not historical facts are forward-looking statements about the future performance of Sumitomo Chemical. These statements are based on management's assumptions and beliefs in light of the information currently available to it, and involve risks and uncertainties.

The important factors that could cause actual results to differ materially from those discussed in the forward-looking statements include, but are not limited to, general economic conditions in Sumitomo Chemical's markets; demand for, and competitive pricing pressure on, Sumitomo Chemical's products in the marketplace; Sumitomo Chemical's ability to continue to win acceptance for its products in these highly competitive markets; and movements of currency exchange rates.