Environment

Contributing to the SDGs through Environmental Activities

Contents

Environmental Activity Goals and Results

Goal achieved or steadily progressing: ○ Goal not achieved: △

Items		Boundary	Goals	Fiscal 2022 Results	Evaluation	Pages
Climate Change Mitigation and Adaptation	Greenhouse gas emissions Scope 1+2*1	Sumitomo Chemical Group Consolidated	Reduce 36% compared to fiscal 2020 levels by 2030	Reduced 11% relative to fiscal 2020	○	Pages 102–115
	Scope 3*2	Sumitomo Chemical Group Consolidated	Reduce 14% relative to fiscal 2020 for categories 1 and 3*3 by fiscal 2030	Reduced 4.1% relative to fiscal 2020	○	
	Unit energy consumption*4	Sumitomo Chemical Group Consolidated	Improve more than 3% over the three years of the Corporate Business Plan (set the base year at fiscal 2021 in tandem with the start of a new corporate business plan (fiscal 2022–2024))	Improved 14% relative to fiscal 2021	○	
	Unit energy consumption in the logistics division	Sumitomo Chemical and Group companies in Japan*5	Improve over 1% per year on average over five years	Worsened by an annual average of 0.2% over five years	△	

Note: Further details on goals based on the Act on the Rational Use of Energy and results are provided in the supplementary data (pages 132–133).

*1 Scope 1: Direct greenhouse gas emissions from operators themselves (fuel burning and industrial processes)
Scope 2: Indirect emissions from purchases of power and heat from outside the factory

*2 Scope 3: Emissions from the manufacturing and transportation of purchased raw materials

*3 Category 1: Purchased goods and services
Category 3: Fuel and energy activities not included in Scopes 1 or 2

*4 Energy consumption divided by consolidated net sales

*5 Within the scope of specified shippers according to the definition stipulated under the Act on the Rational Use of Energy

Goal achieved or steadily progressing: ○ Goal not achieved: △

Items		Boundary	Fiscal 2022 Goals	Fiscal 2022 Results	Evaluation	Fiscal 2023 Goals	Pages
Contribute to Recycling Resources	Promoting the effective use of plastic resources	Sumitomo Chemical and Group companies in Japan	Improve total amount of valuable resources and effective usage*6 by at least 1% on average per year relative to fiscal 2020	Improved 1.7% relative to fiscal 2020	○	Improve total amount of valuable resources and effective usage by at least 1% on average per year relative to fiscal 2020	Pages 116–121
		Group companies overseas	Improve total amount of valuable resources and effective usage*6 by at least 1% on average per year relative to fiscal 2020	Worsened 14.6% relative to fiscal 2020	△	Improve total amount of valuable resources and effective usage by at least 1% on average per year relative to fiscal 2020	
	Reduce the amount of industrial waste sent to landfills	Sumitomo Chemical	Maintain 80% reduction compared to fiscal 2000 levels	Reduced by 92.5% relative to fiscal 2000	○	Maintain 80% reduction compared to fiscal 2000 levels	
		Sumitomo Chemical and Group companies in Japan	Maintain waste volume at below fiscal 2015 levels to fiscal 2022	Reduced by 4.8% relative to fiscal 2015	○	Maintain waste volume at below fiscal 2015 levels to fiscal 2023	
	Promoting the effective use of industrial waste	Sumitomo Chemical and Group companies in Japan	Improve effective usage rate*7 by at least 1% on average per year relative to fiscal 2020	Improved 1.0% relative to fiscal 2020	○	Improve effective usage rate by at least 1% on average per year relative to fiscal 2020	
		Group companies overseas	Improve effective usage rate*7 by at least 1% on average per year relative to fiscal 2020	Improved 1.0% relative to fiscal 2020	○	Improve effective usage rate by at least 1% on average per year relative to fiscal 2020	
	Properly treated PCB waste	Sumitomo Chemical and Group companies in Japan	• High concentrations of PCB*8: Work toward appropriate storage and recovery of waste containing high concentrations of PCBs and complete PCB waste treatment at an early stage • Minute amounts of PCB*9: Work toward appropriate storage and recovery of waste containing minute amounts of PCBs and complete PCB waste treatment by March 2025	• High concentrations of PCBs: Sumitomo Chemical: Completed treatment Group companies in Japan: Completed treatment • Minute amounts of PCBs: Implemented the treatment of waste containing minute amounts of PCBs at certain factories; continued to promote the storage and recovery of untreated waste	○	• High concentrations of PCBs: Work toward appropriate storage and recovery of waste containing high concentrations of PCBs and complete PCB waste treatment at an early stage • Minute amounts of PCBs: Work toward appropriate storage and recovery of waste containing minute amounts of PCBs and complete PCB waste treatment by March 2025	

Note: Further details are provided in the supplementary data (pages 134–154).

*6 Effective usage amount = (amount internally recycled and reused + amount of internally recovered heat) + (amount externally recycled and reused + amount of externally recovered heat)

*7 Effective usage rate = {(amount internally recycled and reused + amount of internally recovered heat) + (amount externally recycled and reused + amount of externally recovered heat)}/amount of waste generated × 100

*8 High concentrations of PCBs: Polychlorinated biphenyls (PCBs) intentionally used as insulation oil in such items as electric appliances

*9 Minute amounts of PCBs: PCBs unintentionally mixed into insulation oil in such items as electric appliances (over 0.5 mg/kg)

Environmental Activity Goals and Results

Goal achieved or steadily progressing: ○ Goal not achieved: △

Items		Boundary	Fiscal 2022 Goals	Fiscal 2022 Results	Evaluation	Fiscal 2023 Goals	Pages
Sustainable Use of Natural Capital	Severe environmental accidents	Sumitomo Chemical and Group companies in Japan	0	0	○	0	
	Laws and regulations, etc.	Sumitomo Chemical	Properly respond to more stringent laws and regulations and proactively address trends in new environmental regulations	Offered industrial insights in collaboration with Japan Chemical Industry Association and other organizations at governmental committee meetings, including those held for the Air Pollution Control Act (related to photochemical oxidants)	○	Properly respond to more stringent laws and regulations and proactively address trends in new environmental regulations	
	Environmental protection management methods, etc.	Sumitomo Chemical	Provide individual support to Group companies for responding to environmental regulations	Provided individual support related to the Waste Management and Public Cleansing Law, the Soil Contamination Countermeasures Act, the Act on Rational Use and Proper Management of Fluorocarbons, the PRTR Act and Water Pollution Prevention Act.	○	Provide individual support to Group companies for responding to environmental regulations	
	Conservation of Biodiversity	Sumitomo Chemical	Ensure compliance with "Sumitomo Chemical's Commitment to the Conservation of Biodiversity" and strengthening effort	Participated in biodiversity conservation initiatives through the nature symbiosis website promoted by the Ministry of the Environment	○	Ensure compliance with "Sumitomo Chemical's Commitment to the Conservation of Biodiversity"	
	Prevention of air and water pollution	Sumitomo Chemical	Meet voluntary management criteria*1	The legal emission standard limit was exceeded, albeit slightly, at some worksites	△	Meet voluntary management criteria	Pages 122–131
	Prevention of ozone layer depletion	Sumitomo Chemical and Group companies in Japan	• Eliminate the use of refrigeration units that use CFCs as coolants by fiscal 2025 • Eliminate the use of refrigeration units that use HCFCs as coolants by fiscal 2045	Systematically replaced refrigeration units that use CFCs and HCFCs as coolants	○	• Eliminate the use of refrigeration units that use CFCs as coolants by fiscal 2025 • Eliminate the use of refrigeration units that use HCFCs as coolants by fiscal 2045	
	Response to PRTR	Sumitomo Chemical	Maintain 60% lower total emissions relative to fiscal 2008	Reduced emissions by 89.9% relative to fiscal 2008	○	Maintain 60% lower total emissions relative to fiscal 2008	
		Sumitomo Chemical and Group companies in Japan	Maintain total emissions of air and water pollutants at below fiscal 2015 levels to fiscal 2022	Reduced emissions by 13.7% relative to fiscal 2015	○	Maintain total emissions of air and water pollutants at below fiscal 2015 levels	
	Reduction of VOC emissions	Sumitomo Chemical	Maintain VOC emissions reductions at 30% relative to fiscal 2000	Reduced emissions by 62.5% relative to fiscal 2000	○	Maintain VOC emissions reductions at 30% relative to fiscal 2000	
	Effective use of water resources	Sumitomo Chemical	Promote effective and efficient use of water resources	Water usage worsened by 4.1% relative to fiscal 2021	△	Promote effective and efficient use of water resources	
		Group companies overseas	Improve unit water consumption by at least 1% on average per year	Worsened 4.3% relative to fiscal 2020	△	Improve unit water consumption by at least 1% on average per year	
	Prevention of soil and groundwater contamination	Sumitomo Chemical and Group companies in Japan	Keep hazardous materials strictly within Company premises*2	Leaks occurred, albeit minor, within the premises of some worksites	△	Keep hazardous materials strictly within Company premises	

Note: Further details are provided in the supplementary data (pages 134–154).

*1 Voluntary management targets that are stricter than the mandated levels and criteria of relevant laws and regulations, including agreements reached with local authorities.

*2 Keep hazardous materials strictly within Company premises: Controlled on the premises.

Climate Change Mitigation and Adaptation

Basic Stance

Sumitomo Chemical considers climate change a social issue on which chemical companies should take the lead. To swiftly address this problem, we are actively working to respond to risks and to seize opportunities by utilizing the technology we have cultivated to date. In addition, regarding disclosure related to climate change, we will continue gaining the trust of society by actively raising awareness of our initiatives using the framework of the TCFD recommendations.

Furthermore, with movements aimed at achieving carbon neutrality picking up steam in recent years, the chemical industry is being strongly called upon to create innovation and contribute to the achievement of carbon neutrality for society at large through its businesses. In December 2021, Sumitomo Chemical formulated and publicized its "grand design to achieve carbon neutrality," setting out a direction for its initiatives aimed at realizing carbon neutrality by 2050. In line with this, we will push ahead with initiatives that address both our obligation to bring our own greenhouse gas (GHG) emissions close to zero and the contribution we can make to promoting carbon neutrality for society as a whole through our technologies and products. To fulfill our obligation, we have committed ourselves to reducing our GHG emissions by 50% by 2030 (compared to the level of emissions in FY2013), and to achieving net zero GHG emissions by 2050. We will also contribute to the reduction of GHG emissions throughout society by engaging in external collaboration and otherwise facilitating innovation to develop products and technologies that serve this end, along with pursuing their social implementation, with the aim of helping communities around the world realize carbon neutrality.

■ Grand Design toward Achieving Carbon Neutrality

Obligations
Approach zero greenhouse gas emissions for the Sumitomo Chemical Group*1

Contributions
Reduce global greenhouse gas emissions through the Sumitomo Chemical Group's products and technologies

Both fulfill obligations related to and contribute toward the achievement of carbon neutrality

the Sumitomo Chemical Group way

Greenhouse gas emissions (Scope 1+2)*2 at the Sumitomo Chemical Group

50%*3 Reduction by 2030

Reach net zero by 2050

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	Drive the development of technologies that contribute to carbon neutrality and their rapid deployment into society	Take on long-term challenges, including the development of carbon negative technologies
● Provide proprietary manufacturing technologies and products that contribute to GHG reductions ● Build a structure to evaluate carbon footprints	● Build a carbon resources recycling system ● Develop low-GHG emitting process technologies in membrane-based separation and wastewater treatment	● Develop carbon negative technologies ● Develop CCUS*4 technology

*1 Referring to Sumitomo Chemical Co., Ltd. and its consolidated subsidiaries in and outside Japan

*2 Scope 1: Greenhouse gases directly emitted by plants, such as in the use of fuels and in manufacturing products
Scope 2: Greenhouse gases emitted indirectly, such as through the purchase of electric power or steam from outside the Company's plants

*3 Compared to FY2013

*4 CCUS: Carbon dioxide Capture, Utilization and Storage

Climate Change Mitigation and Adaptation

Disclosure in Line with TCFD Recommendations

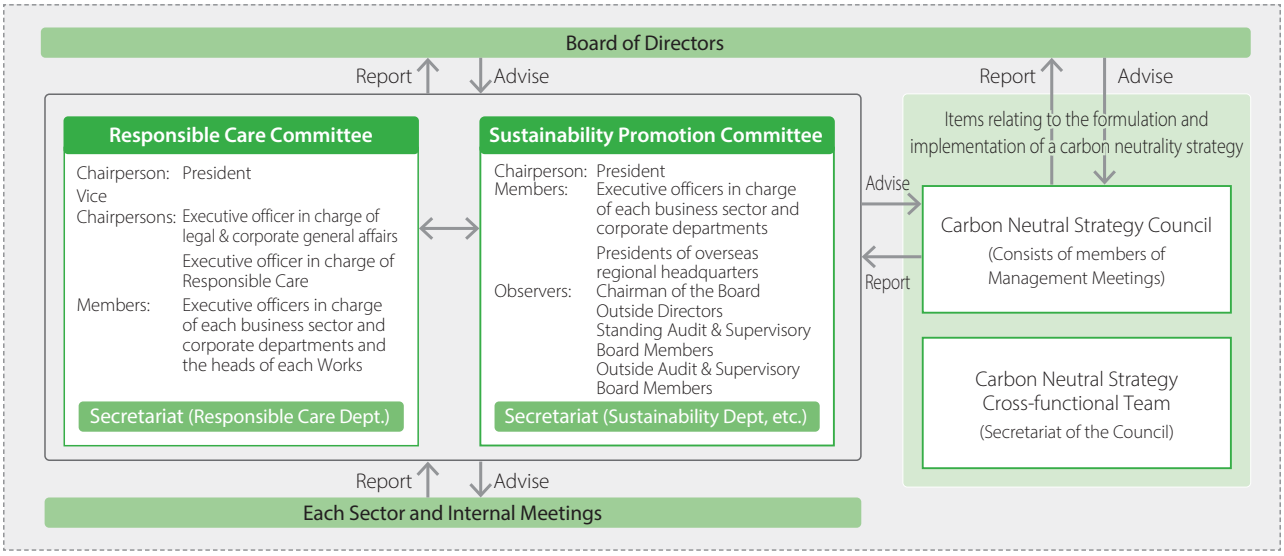
Sumitomo Chemical expressed its support for the TCFD recommendations when they were published in June 2017. In line with the four recommended disclosure items, "Governance," "Risk Management," "Strategy," and "Metrics and Targets," the Group's efforts to address climate change issues are introduced on pages 103-115.

Governance

Sumitomo Chemical has established meetings and committees to deliberate important matters related to the management of the Group from a broad and diverse perspective in order to enhance its business execution and supervisory functions. Through these meetings and committees, the Company reports to the Board of Directors on issues related to the promotion of sustainability, including climate change.

Management Meetings	Deliberation of important matters such as management strategies and capital investments, including agenda items and report items related to climate change response
Sustainability Promotion Committee	Deliberations on important matters related to sustainability promotion
Responsible Care Committee	Formulation of annual policies, mid-term plans, and specific measures to address climate change, as well as analysis and evaluation of performance
Carbon Neutral Strategy Council	Deliberation and promotion of the grand design for achieving carbon neutrality by 2050

■ Structures for Responding to Climate Change



A wide range of specific issues related to energy and greenhouse gases (GHGs) are taken up for detailed discussion at Company-wide Science Based Targets (SBTs) GM Meetings, SBT Promotion Working Groups, Company-wide Energy Manager Meetings, Department Liaison Meetings on Global Warming, Group Company Information Exchange Meetings, and other gatherings. Through the establishment of these various meetings, we have created a system capable of steadily and swiftly sharing important information in addition to managing energy and GHGs for Works, research laboratories, business sectors, and Group companies.

Meeting	Coordinator	Members	Content
Company-wide SBTs GM Meeting	Executive officer responsible for Responsible Care	General managers in charge of SBTs at individual worksites	Discussing various measures aimed at achieving SBTs
SBT Promotion Working Group	Process & Production Technology & Safety Planning Department general manager	Corporate Planning Office, Research Planning and Coordination Department, Process & Production Technology & Safety Planning Department, Responsible Care Department, and Environmental Burden Reduction Technology Development Group	Proposing various multi-faceted measures to achieve SBTs
Company-wide Energy Manager Meeting	Responsible Care general manager	Section managers in charge of Energy and GHGs at their worksites	Sharing and spreading information on initiatives at each worksite
Department Liaison Meeting on Global Warming	Responsible Care general manager	Section managers in charge of climate change action at the departmental and corporate levels	Sharing Company-wide policies and ESG issues
Group Company Information Exchange Meeting	Executive officer responsible for Responsible Care	Managers in charge of climate change action for Group companies	Sharing Group policies and issues and promoting best practices

Climate Change Mitigation and Adaptation

Risk Management

To achieve sustainable growth, Sumitomo Chemical makes an effort to detect, at an early stage, various risks that may hinder the achievement of its business objectives, and takes proper measures. We focus on building and expanding our system relating to risk management so that we can promptly and properly address risks when they emerge.

Climate change issues are positioned as one of the Group's major medium- to long-term risks through, for example, an assessment from the perspective of the likelihood of their occurrence and impact, and are integrated into the Group's overall risk management process.

Specific Procedures

Each organization, including Group companies in Japan and overseas, conducts risk evaluations from the perspectives of probability of emergence (frequency) and financial impact in the event of emergence. The Internal Control Committee, which is chaired by the President, deliberates and identifies Company-wide material risks that need Group-wide initiatives, which may later be approved. The seriousness of each risk is determined by multiplying the probability of the individual risk by the financial or strategic impact on the Group's businesses.

Based on these processes, we have identified climate change-related risks and opportunities as detailed in the following table.

■ Risks and Opportunities

Risks

Transition risks
- Increases in tax burden due to the introduction and increase of carbon prices
- Increases in manufacturing costs associated with the increase in energy taxes
- Higher logistics costs due to higher energy prices

Physical risks
- Damage to production facilities due to intensified climate disasters caused by temperature rise
- Decline in sales of related businesses due to changes in crop cultivation in various regions worldwide amid abnormal weather

Opportunities
- Increasing demand for products that contribute to reducing greenhouse gas (GHG) emissions
- Increasing demand for products that adapt to the impacts of climate change
- Growing market for low-carbon processes
- Development of new businesses in the area of climate change measures through research and development and digital innovation

Responding to Risk
- Initiatives Aimed at Achieving Carbon Neutrality
  - Adoption of the internal carbon price system to enhance energy saving and promote investment in reducing of GHG emissions
  - Switching to renewable energy
  - Switching fuel to LNG
  - Collaboration with partners to ensure a stable supply of clean ammonia
  - Calling on major suppliers to set GHG emission reduction targets
- Strengthening measures against wind and flood damage at production sites

Initiatives for Seizing Opportunities
- Expansion of sales of products that contribute to reducing GHG emissions
- Development of plastic recycling technologies
- Development of products that contribute to carbon-negative goals
- Promotion of licenses for GHG reduction technology
- Expansion of sales of products that contribute to adapting to the impacts of climate change
- Acquisition of investment capital through information disclosure

P.73 Risk Management

Climate Change Mitigation and Adaptation

Strategy

In December 2021, Sumitomo Chemical formulated a grand design for achieving carbon neutrality by 2050. We will promote efforts to mitigate climate change from the perspectives of both "Obligation" (to bring the Group's GHG emissions close to zero) and "Contribution" (to reduce global GHG emissions through the Group's products and technologies).

In addition, as part of our efforts to adapt to climate change, we are striving to provide solutions adapted to global environmental changes, in such areas as agriculture and infectious diseases, and to strengthen new product development.

Investments to Achieve Carbon Neutrality

Starting in FY2019, in order to contribute to the realization of carbon neutrality for society as a whole, we calculate economic indicators reflecting internal carbon pricing (10,000 yen per ton) when GHG emissions are expected to increase or decrease for individual investment projects, and make investment decisions.

Investment Scale

We expect to invest a total of approximately 200 billion yen between FY2013 and FY2030 in carbon neutral-related investments.

Scenario Analysis

Scenario analysis, with regard to climate change, is a method in which we consider multiple scenarios, predict the impact of climate change and changes in the business environment due to long-term policy trends, and study the potential impact of these changes on our business and management. Currently, Sumitomo Chemical analyzes risks and opportunities with respect to both a scenario in which a variety of measures are taken to limit average global temperature increase to 1.5°C above the pre-industrial revolution levels, and a scenario in which countermeasures are not taken and temperatures increase by 4°C, evaluating the impacts of the two scenarios on our businesses and future actions that need to be taken.

Climate Change Mitigation and Adaptation

Summary of the Scenario Analysis

● In blue: positive impact ● In red: negative impact

Scenario	Risks and Opportunities	Anticipated Situation (Example)	Impact Assessment	Action
Common for All Scenarios*1	Increasing Demands for Disclosure of Information	● Expansion of ESG investment ● Increased demands for disclosure of the results of life cycle assessment ● Legalization of disclosure of climate change-related information, and introduction of new environmental accounting standards	● Increased opportunity to get access to ESG investment capital by enhancing information disclosure ● Improved rating in stakeholder assessments with regard to the disclosure of the amount of GHG emissions reduction calculated by life cycle assessment ● Increased cost of compliance	● Formulate and release our Grand Design for achieving carbon neutrality ● Disclose the amount of avoided GHG emissions (Science-Based Contributions) ● Develop a carbon footprint calculation tool (CFP TOMO™) and provide it to other companies for free ● Respond to trends in regulations and movements by related institutions
1.5°C Scenario (Reduced GHG Emissions)	Increased Demand for Products and Technologies Contributing to the Mitigation of Climate Change	● Increasing investment and growing market for products and technologies contributing to the reduction of GHG emissions and for products and technologies related to recycling Examples • Growing markets for EVs and fuel cell vehicles (2020 to 2050) • Growing markets for components and materials for high-efficiency communication, due to change in consumer behavior (including expansion of the sharing economy and more efficient logistics with the use of IT) • Shift to low-carbon energy sources • Expansion of CCUS*2 (2030 onward) • Expansion of the circular economy, with the aim of reducing GHG emissions derived from fossil fuels (2020 to 2050) • Growing markets for energy-saving homes and building materials	● Increased demand for SSS*3-designated products ● Increasing need for technological development for future SSS-designated products Examples • Components and materials for EVs and fuel cell vehicles • Increased sophistication in IT devices, demand for electronic components necessary to reduce energy consumption, demand for related products and technologies necessary for distributed power systems and semiconductor control devices • Technology that contributes to reducing GHG emissions • Products and technologies for CO_2 recovery, on the back of the expansion of CCUS • Carbon negative technologies • Recycling-related products and technologies • Biologically derived products and technologies • Energy-saving construction materials, such as heat-storing materials	● Enhance development and production systems for products such as lightweight materials, battery materials, and materials for optical products and electronic components ● Develop a process for recycling lithium-ion batteries ● Enhance development and production systems for materials for next-generation power devices and high-efficiency communications ● Promote licensing of technologies that contribute to reducing GHG emissions (for example: the hydrochloric acid oxidation process and the propylene oxide-only process) ● Develop technologies relating to CO_2 recovery ● Develop products that contribute to negative carbon emissions (for example: agricultural materials utilizing fungi, resins produced from microbes) ● Develop plastic recycling technology and build a recycling chain in cooperation with waste management companies ● Develop technology for biologically derived products ● Develop technology for and expand sales of heat storage material products ● Promote the utilization of CO_2-free hydrogen and ammonia
	Increased Regulation on GHG Emissions	● Higher carbon prices (in developed countries, USD 140/ton for 2030, USD 250/ton for 2050)*4	● Increased operational costs due to higher energy taxes including carbon prices (Assuming volume of GHG emissions in fiscal 2050 is about 6.58 million tons/year (Scope 1+2), the same level as in fiscal 2022, and a carbon price between 19,000–34,000 yen per ton of CO_2, our expense burden will increase by about 130–220 billion yen per year.)	● Consider carbon-neutral petrochemical complexes and ports ● Switch to highly efficient equipment by actively utilizing government subsidies ● Switch to renewable energy ● Switch fuel to LNG ● Rationalization research for manufacturing processes ● Develop technologies to capture, separate, and utilize GHG, and deploy them in society ● Promote the deployment of GHG emission removal equipment ● Collaborate with other companies to secure a stable supply of clean ammonia
		● Stronger requirements for GHG emissions reductions and making energy-saving performance mandatory ● Phased abolishment of subsidies for fossil fuels (in India and Southeast Asia, etc.) ● Accelerating transition to a circular society and increased regulation ● Increase in calls to promote use of renewable energy from customers	● Lower utilization of high-energy consumption production facilities ● Increase in utility expenses due to an increased proportion of renewable energy	
	Increased Cost of Raw Materials	● More use of resources from circular systems and progress in the transition to lower environmental impact processes ● Increased costs due to more use of recycled materials ● Increase in calls for green procurement	● More difficult to procure raw materials ● Lower profitability of the existing businesses	● Diversify raw material sources ● Evaluate the use of recycled raw materials ● Evaluate self-manufacture of raw materials with unstable supply ● Shift to a local production, local consumption model (for products where raw material procurement costs make up a relatively high proportion of the price)
4°C Scenario (Business as Usual)	Increased Demand for Products and Technologies Adaptable to Climate Change	● Growing market for crops resistant to environmental changes such as temperature rise and drought ● Spread of infectious diseases due to the impact of climate change	● Increased demand for SSS-designated products ● Increased need for technological development for future SSS-designated products Examples • Biorationals and soil amendments • Agrochemical products adaptable to the change in crop growth • Agents for prevention and treatment of infectious diseases	● Develop products such as biorationals ● Provide solutions that respond to global changes in the environment for agriculture and infectious diseases ● Enhance sales and marketing structures and new product development structures with an eye on changes in demand in targeted markets
	Intensified Climate Disasters due to Temperature Rise	● More impact on plant operations ● Rising sea level, damage from storm surges and floods, and heat waves ● Damage to farmland due to droughts and soil degradation	● Facilities located on seashores and river banks cease operations ● Decreased cost competitiveness of plants due to increased costs for measures to be prepared for disasters ● Decreased demand due to lower agricultural productivity	● Manage and respond to risks from a business continuity planning perspective ● Expand and diversify the regions in which we do business

*1 Common for all scenarios: Situations that can be expected in both the 1.5°C scenario (reduced GHG emissions) and the 4°C scenario (business as usual)
*2 CCUS: Carbon dioxide Capture, Utilization and Storage *3 Sumika Sustainable Solutions *4 Assumptions based on World Energy Outlook 2022

Climate Change Mitigation and Adaptation

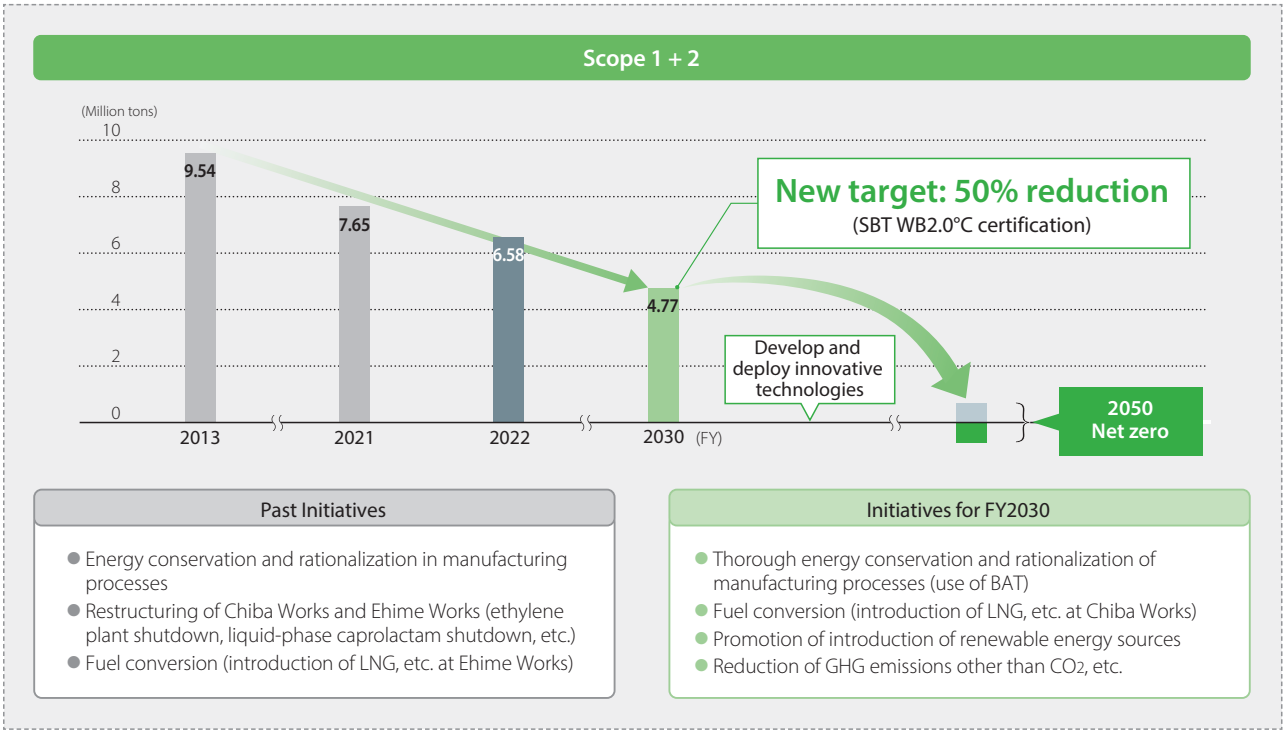
Metrics and Targets (Risk)

As a metric for climate-related risks, we are the first diversified chemical company in the world to utilize GHG emission reduction targets certified as Science Based Targets (SBT). Our Group's*1 GHG emissions (Scope 1 + 2) reduction target for 2030 is 50%*2, and has been certified under SBT's Well Below 2.0°C standard. Until 2030, we aim to achieve this goal by utilizing the best available technology (BAT) in the manufacturing process at existing plants and by making thorough energy conservation and fuel switching in the manufacturing process.

On the other hand, to reach net-zero emissions by 2050, it will be difficult to respond only with existing technologies, and innovative technologies such as carbon-negative emissions and CCUS*3 will be necessary. We will continue to study the development of them and their early implementation.

*1 Sumitomo Chemical + domestic and overseas consolidated subsidiaries
*2 Compared to FY2013
*3 Capture, effective utilization, and storage of CO_2 emitted from plants, etc.

GHG Emissions Trends and Reduction Targets (Scope 1+2)



P.21 KPIs for material issues for social value creation: Amount of Group's GHG emissions (Scope 1+2)

Climate Change Mitigation and Adaptation

★: Assured by an independent assurance provider

FY2022 Energy Consumption and Greenhouse Gas Emissions

The Group's greenhouse gas emissions for fiscal 2017 onward are calculated based on the GHG Protocol (refer to page 238 "Calculation Standards for Environmental and Social Data Indicators"). The boundary of calculation has been expanded to include principal consolidated Group companies, which account for up to 99.8% of consolidated net sales.

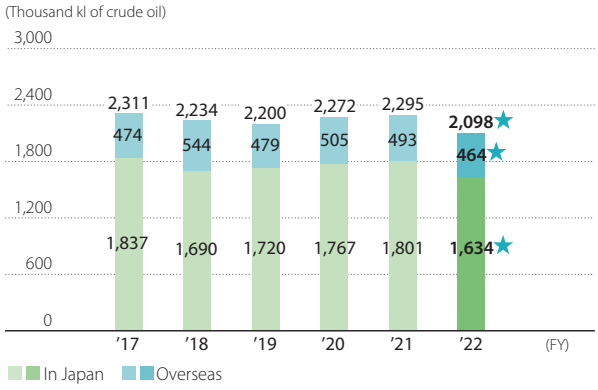
Greenhouse Gas Emissions ★

(Thousand tons of CO_2e)

	Sumitomo Chemical and Group Companies in Japan	Overseas Group Companies	Total
Scope 1	5,231	442	5,673
Scope 2	187	718	905
Total	5,418	1,161	6,578

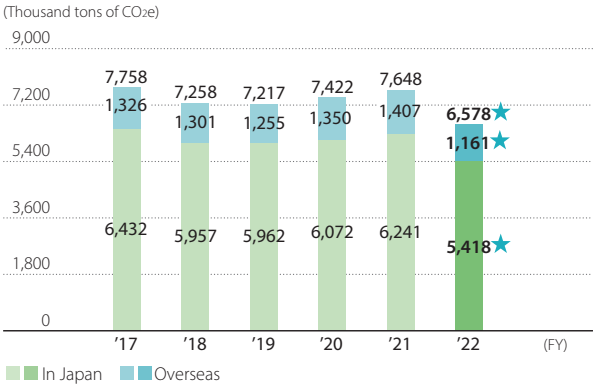
Note: Biomass-derived emissions were 50 thousand tons of CO_2e

Energy Consumption (GHG Protocol standards)



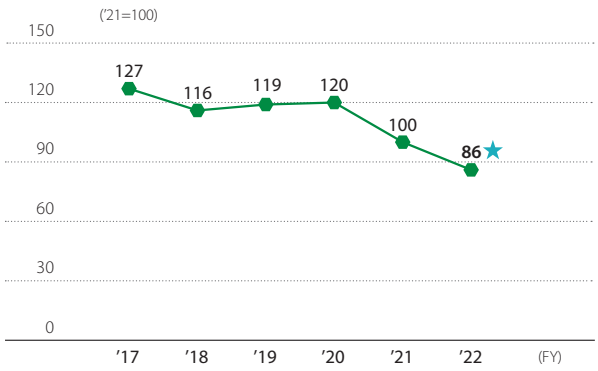
Notes: • Having adopted the GHG Protocol standards for our GHG emission disclosures, we now include the following data previously excluded from calculations: amount of energy consumed in the production of power and steam sold to external parties by Sumitomo Chemical Group. The amount of energy consumed by Sumitomo Chemical's non-production sites and the Group's non-production sites is included from fiscal 2017 and fiscal 2018, respectively.

Greenhouse Gas Emissions (GHG Protocol standards)



Notes: • Having adopted the GHG Protocol standards for our GHG emission disclosures, we now include the following data that was not included in previous calculations: CO_2 emissions from energy sold to external parties by the Group; CO_2 emissions from energy use attributable to Sumitomo Chemical's non-production sites; CO_2 emissions from non-energy sources not included in the scope of the Act on Promotion of Global Warming Countermeasures. CO_2 emissions from energy use attributable to Sumitomo Chemical's non-production sites and the Group's non-production sites is included from fiscal 2017 and fiscal 2018, respectively.

Unit Energy Consumption Index (GHG Protocol standards)



Notes: • The figures are indexed to energy consumption (GJ) per unit of sales
• The figures are indexed to fiscal 2021 at 100 because we aim to improve at least 3% over the three years of our Corporate Business Plan (FY2022–2024)

Climate Change Mitigation and Adaptation

★: Assured by an independent assurance provider

GHG Emission Reduction Targets (Scope 3)

Scope 3

Reduce GHG emissions (Scope 3: Categories 1 and 3) of major Group companies **by 14% from the FY2020 level** by FY2030 (SBT WB2.0°C certification)

Supplier Engagement Initiatives

As part of our efforts to encourage our major suppliers to reduce GHG emissions, we hold an annual supplier information exchange meeting. In 2023, we held a hybrid face-to-face and web-based meeting with 43 major suppliers in Japan to explain our efforts to reduce Scope 3 emissions and to request their cooperation in reducing GHG emissions and sharing information on reductions. In recognition of these efforts, the company has been selected as a "Supplier Engagement Leader," the highest rating in the Supplier Engagement Rating conducted by CDP, an international NGO, for four consecutive years.

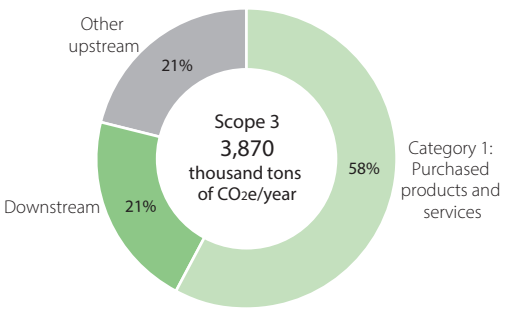
CDP SUPPLIER ENGAGEMENT LEADER 2022

Status of Scope 3 GHG Emissions

(Thousand tons of CO_2e/year)

Category	Emissions			
	FY2019	FY2020	FY2021	FY2022
1. Purchased goods and services	2,276	2,346	2,441	2,261★
2. Capital goods	151	164	141	146
3. Fuel- and energy-related activities not included in Scopes 1 and 2	581	585	559	550★
4. Upstream transportation and distribution	60	53	55	53★
5. Waste generated in operations	35	41	58	37★
6. Business travel	10	2	3	7
7. Employee commuting	11	11	9	9
8. Upstream leased assets	<1	<1	<1	<1
9. Downstream transportation and distribution	<1	<1	<1	<1
10. Processing of sold products	—	—	—	—
11. Use of sold products	40	42	45	34★
12. End-of-life treatment of sold products	879	806	788	772
13. Downstream leased assets	—	—	—	—
14. Franchises	—	—	—	—
15. Investments	—	—	—	—

Notes:
- For Scope 3 data, indirect greenhouse gas emissions from business activities throughout the supply chain are calculated separately by category and then added together.
- Calculated for Sumitomo Chemical and Group companies listed on stock indices in Japan (Sumitomo Pharma Co., Ltd.; Koei Chemical Co., Ltd.; Taoka Chemical Co., Ltd.; and Tanaka Chemical Corporation).
- Category 4 does not include Taoka Chemical Co., Ltd., but includes Nippon A&L Inc.
- Category 11 figures are N_2O converted into CO_2

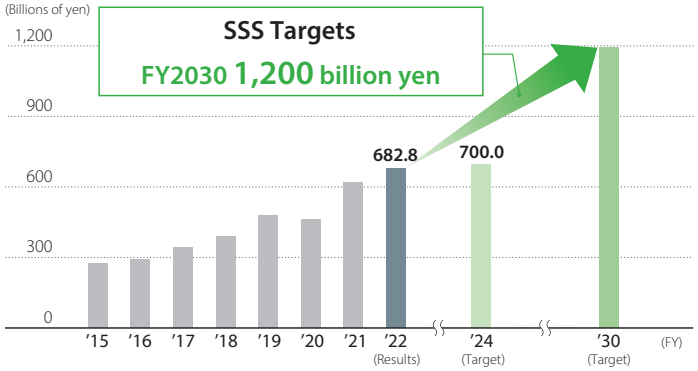


Climate Change Mitigation and Adaptation

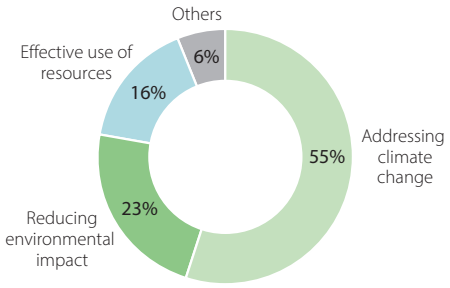
Metrics and Targets (Opportunities)

Sumika Sustainable Solutions (SSS) is used as a metric for climate-related opportunities. SSS is an initiative in which we designate those of our Group's products and technologies that contribute to the fields of addressing climate change, reducing environmental impact, and effective use of resources in order to promote their development and spread. In FY2022, sales revenue from SSS-certified products totaled 682.8 billion yen, making steady progress toward the FY2030 goal of 1.2 trillion yen.

Sumika Sustainable Solutions' Sales Revenue Targets



Percentage of products and technologies in each certified field (FY2022)



Note: Number of SSS certified products and technologies (total): 71

Quantifying avoided GHG emissions through SSS-Certified Products and Technologies

Science Based Contributions (SBC)

Avoided GHG emissions through products and technologies

In order to more clearly demonstrate the contribution of our products and technologies to carbon neutrality (CN), we have established a new indicator, Science Based Contributions. By calculating and visualizing the contribution to avoided greenhouse gas (GHG) emissions, we will accelerate our efforts to achieve CN for society as a whole through our products and technologies. The SBC quantitatively and scientifically calculates the amount of GHG reductions achieved in society through the use of SSS certified products and technologies that we have sold and provided. The figures are calculated based on the product CFP and sales volume of the subject products and the production capacity of the licensed plants, etc. The calculation method is validated by external experts. We will strive to promote understanding of the contribution of our products and technologies to society through active disclosure of information to our stakeholders using the SBC, and promote efforts to realize CN around the world.

FY2022 SBC results: 8.3 million tons

SSS Technology	Propylene oxide (PO)-only process Hydrochloric acid oxidation process	Licensees	2.7 million tons
SSS End Products	Methionine Flumioxazin, etc.	Users	5.6 million tons
SSS Materials & Components	Components for Secondary Batteries and aircraft, etc.	Users	Not applicable (under consideration)

Calculation Method

SSS are classified into the three categories of technology, end products, and materials/components, and CFP is calculated from the difference by comparing the CFP of SSS with that of technologies and products in widespread use as of 2013. (Based on single-year sales volume)

SSS Technology
- PO-only process is compared to the average of other PO manufacturing processes, such as the chlorine process, and hydrochloric acid oxidation process is compared to the salt electrolysis process.
- Calculation of reduction contribution by licensees.

SSS Products
- Methionine is compared to feed without additives. The contribution to the reduction of N_2O in poultry waste was calculated.
- Regarding the Flumioxazin, contributions to emissions reduction achieved by no-till farming in the U.S. were calculated by comparing no-till farming for soybean cultivation with the conventional farming method.

Sumika Sustainable Solutions

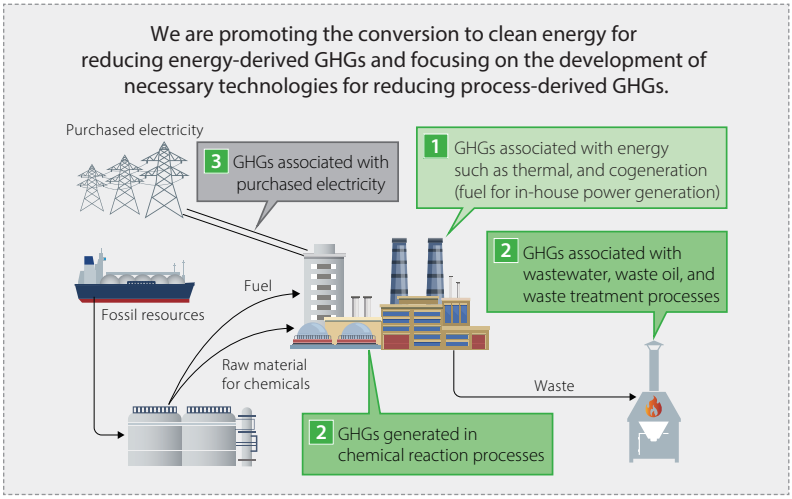
https://www.sumitomo-chem.co.jp/english/sustainability/management/promotion/sss/

Climate Change Mitigation and Adaptation

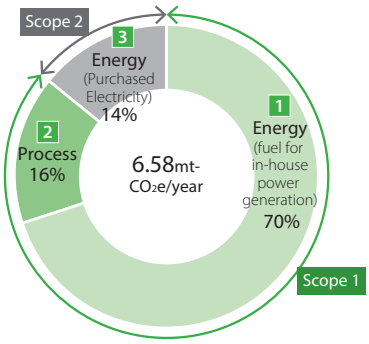
Specific Initiatives for "Obligation"

Major Sources of GHG Emissions from Chemical Plants

The chemical industry is an industry in which raw materials are converted into products through chemical reactions that are driven by electricity, heat from steam, and other forms of energy. Of our GHG emissions in FY2022, 70% came from energy sources such as in-house power generation 1, 16% came from processes resulting from chemical reactions and waste treatment 2, and 14% came from energy sources associated with purchased electricity 3. We aim to reduce GHG emissions by focusing on the conversion to clean energy for energy-derived GHGs and on the development of necessary technologies for process-derived GHGs.



■ GHG Emissions in FY2022



1 Reduction of GHG from Energy (fuel for in-house power generation): Fuel Conversion

Sumitomo Chemical is working to reduce the Group's GHG emissions as an SBT-certified company. At plants in Japan, we are introducing highly efficient gas turbine generators and decommissioning a number of existing boilers. Aiming to reduce carbon emissions, we are switching from using conventional high CO_2-emission fuels like coal, petroleum coke, and heavy oil to using low CO_2 emission intensity fuels like liquefied natural gas (LNG).

In March 2022, at Ehime Works, Niihama LNG Co., Ltd.* began operating the Niihama LNG Station, which supplies LNG instead of conventional coal or heavy oil. In November 2022, Sumitomo Joint Electric Power Co., Ltd. started operations of the Niihama North Gas-Fired Power Plant, a facility it constructed that uses LNG. The switchover to this power source is expected to result in a 650,000-ton annual reduction in CO_2 emissions in the near future. In addition, we plan to construct highly efficient gas turbine power generation equipment at Chiba Works that uses LNG instead of the existing petroleum coke, looking to complete construction in autumn 2023. With the construction of this equipment, we expect to reduce annual CO_2 emissions by over 240,000 tons (equivalent to around 20% of the CO_2 emitted by Chiba Works). It will also enable the supply of power to neighboring Group companies as we work hard to reduce GHG emissions across the entire Group.

* Funded by Tokyo Gas Engineering Solutions Corporation, Shikoku Electric Power Co., Inc., Shikoku Gas Co., Ltd., Sumitomo Joint Electric Power Co., Ltd., and Sumitomo Chemical

	Ehime region	Chiba region
Fuel	Coals and heavy oil ▶ LNG	Petroleum coke ▶ LNG
Amount of CO_2 reduction	650,000 tons/year	240,000 tons/year


Niihama North Gas-Fired Power Plant

Climate Change Mitigation and Adaptation

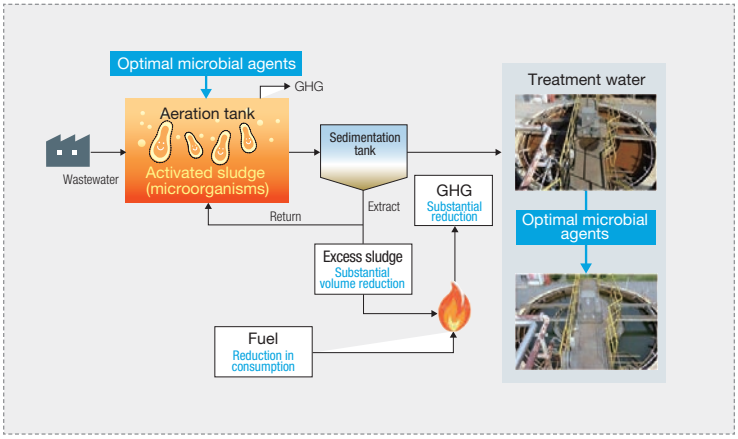
In addition, the following initiatives are being implemented with respect to the conversion from LNG to cleaner fuels.

- Focused on hydrogen and clean ammonia (blue and green), and initiated discussions with Yara, a major foreign ammonia manufacturer, regarding the possibility of its stable procurement.
- In addition, four domestic ammonia suppliers, UBE Corporation, Mitsui Chemicals, Inc., Mitsubishi Gas Chemical Company, Inc., and SUMITOMO CHEMICAL COMPANY, LIMITED have agreed to jointly start discussions to secure a stable supply of clean ammonia, and discussions are ongoing.

We will continue to study the possibility of making each power generation facility cleaner (zero GHG emissions) based on the development status of ammonia and hydrogen combustion technologies, biomass fuel market trends, and regional collaboration efforts.

2 Reduction of Process-derived GHG: Innovations in Wastewater Treatment Technology

Sumitomo Chemical is promoting biotechnological wastewater treatment. Wastewater treatment is an essential initiative to prevent water pollution and promote the recycling and reuse of water resources, but it requires a lot of energy for treatment and generates GHG when excess sludge is incinerated. To address this issue, we have improved wastewater treatment capacity while reducing the amount of sludge generated, GHG emissions associated with wastewater treatment, and fuel consumption through the use of optimal microbial agents.



3 Reduction of GHGs from Energy (purchased electricity): Use of renewable energy

From November 2021, Sumitomo Chemical's Oita Works switched its purchased electric power to 100% renewable energy-derived power, reducing GHG emissions from the Works by around 20%. In addition, at the same Works, we switched the fuel used on site from heavy oil to the low CO_2 emission intensity city gas and are working to optimize the plant operation conditions, achieving a GHG reduction of around 10%. Through these efforts, we realized a total reduction in GHG emissions of around 30% at the Works. (All percentages are in comparison with fiscal 2013.)

Initiatives Aimed at Reducing GHG Emissions at Each Worksite

Each Sumitomo Chemical worksite helps reduce GHG emissions, including in the following ways: installing the latest highly efficient equipment; introducing rationalization and energy-saving measures in production processes; switching to lower-carbon fuels and other forms of energy; installing LED lighting; and soliciting employee suggestions on how to further improve our energy-saving efforts. Furthermore, regarding cleanrooms and other facilities that are highly specialized and difficult to manage, we have launched initiatives in cooperation with experts. Information on the state of these activities is exchanged at Company-wide Energy Manager Meetings, at which representatives from each worksite gather in one location to work on reducing the GHG emissions of the Company as a whole.

Climate Change Mitigation and Adaptation

★: Assured by an independent assurance provider

State of Installing LED Lighting

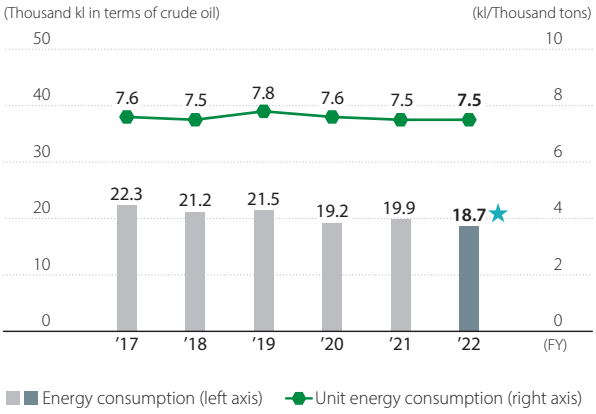
Over 50% of the lighting at all Sumitomo Chemical worksites has already been converted to LEDs, and we achieved the Japan Lighting Manufacturers Association's target of an SSL rate of 50% in 2020. Going forward, we will continue installing LEDs with the aim of achieving a 100% SSL rate in 2030 as a Company-wide initiative.

Logistics Initiatives

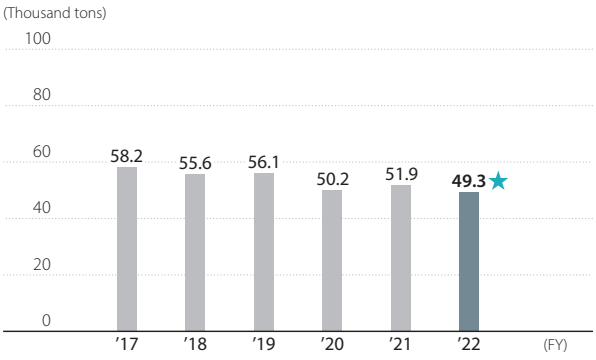
Sumitomo Chemical continues to promote modal shift, or transportation by more efficient and environmentally friendly modes, such as rail and ship instead of trucks. In fiscal 2022, the overall volume of cargo transported fell significantly compared with fiscal 2021. The rate of decrease in intercoastal transport was especially large, and the ratio of truck transport relatively higher. As a result, energy consumption (crude oil equivalent) and carbon dioxide emissions decreased, but unit energy consumption increased 1.3% overall. This was an average 0.2% deterioration over the past five years. We will continue aiming to improve unit energy consumption by our target of 1% or more.

■ Reduction of Environmental Impact in Logistics Operations (Sumitomo Chemical and a Group company in Japan)

Energy Consumption and Unit Energy Consumption



CO_2 Emissions



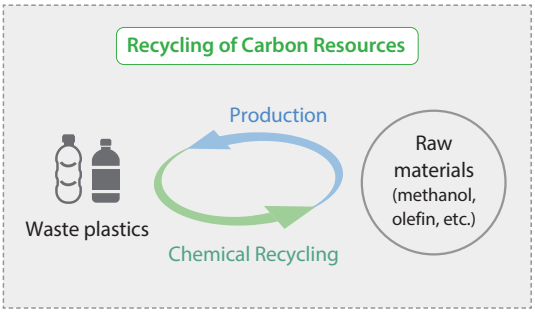
Note: Calculated for Sumitomo Chemical and a Group company in Japan (specified consigner Nippon A&L Inc.)

Specific Initiatives for "Contribution"

Establishment of Carbon Resource Recycling System

We are developing chemical recycling technologies to convert garbage and waste plastics into basic raw materials for chemicals, such as methanol, ethanol, and olefins, and to use them as raw materials for new plastics.

P.116 Contribute to Recycling Resources

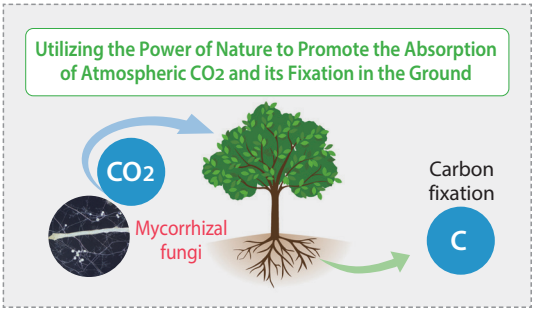


Climate Change Mitigation and Adaptation

Challenges to Carbon Negative Emissions

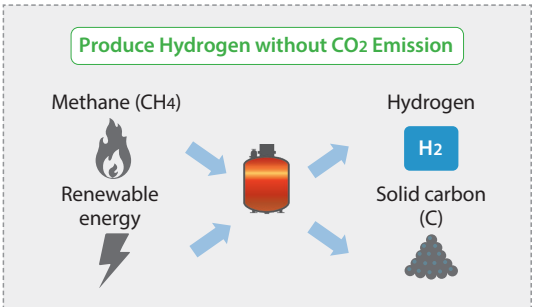
We are developing a technology whereby attaching useful microorganisms existing in soil to the roots of plants and allowing them to coexist, we not only promote the absorption of CO_2 by plants through photosynthesis, we also fix CO_2 in the ground in the form of carbon compounds. This will enable ordinary fields, forests, and other natural spaces to absorb and fix even greater amounts of CO_2, contributing a net negative amount of carbon to the atmosphere.

P.122 Sustainable Use of Natural Capital



Response to Methane Gas

The future shift to clean energy will require the availability of CO_2-free hydrogen. To address this issue, we are developing a technology to produce hydrogen from methane without CO_2 emissions. This technology will help reduce methane, a GHG, and contribute to the realization of carbon neutrality.



External Cooperation Initiatives

Dissemination efforts of Carbon Footprint of Products (CFP)* calculation tool

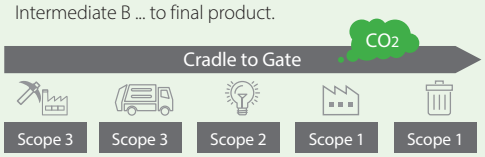
Although the evaluation of product CFP is essential to reduce GHG emissions in society, it is not easy to analyze the CFP of chemical products due to the complexity of their manufacturing processes. In response, we have developed our own automated calculation tool and calculated the CFP of approximately 20,000 products. Currently, we are expanding the scope of evaluation to Group company products. We also provide the tool free of charge to other companies, and at present, more than 70 companies are using the tool, and we have also started collaboration with the Japan Chemical Industry Association.

* Greenhouse gas emissions from each stage of the product lifecycle, from procurement of raw materials to manufacturing, use, and disposal, expressed in terms of CO_2 emissions.

Our original calculation tool speeds up the calculation of CFP for our products

Created the original automatic CFP calculation tool

- 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.



Initiatives through Regional Collaboration

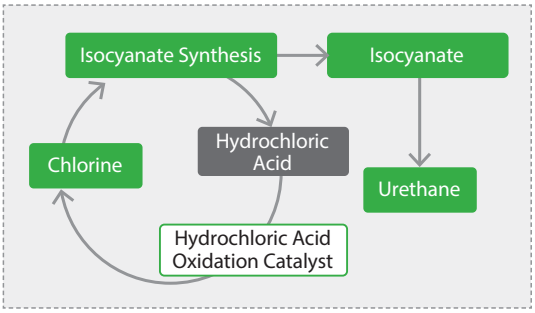
Since there are limits to what individual companies can do to achieve carbon neutrality, it is necessary to accelerate regional collaboration with external parties such as companies outside our group and government agencies. In addition to participating in the Keiyo Coastal Industrial Complex Council on Carbon Neutrality, which was established in November 2022 mainly in Chiba Prefecture, we are also studying ways to achieve carbon neutrality, such as securing biomass feedstock and recovering waste, in cooperation with Maruzen Petrochemical Co. Ltd. And Mitsui Chemicals, Inc. We are proceeding with the study about the port decarbonization plan which is currently promoted by government agencies in cooperation with the local community.

Climate Change Mitigation and Adaptation

Development of Hydrochloric Acid Oxidation Process Technology

Sumitomo Chemical has achieved a major reduction in environmental impact by recycling hydrochloric acid—a manufacturing byproduct—into a raw material through the development of technology that efficiently produces chlorine from hydrogen chloride. This technology allowed us to switch from energy-hungry conventional chlorine manufacturing to a process that uses less than one-fifteenth the energy and, over the next few years, will reduce our GHG emissions by two million tons per year (compared with electrolysis and other processes). We received the Grand Prize at the 54th JCIA Technology Awards (May 2022) for this technology from the Japan Chemical Industry Association (JCIA) for enabling the development and commercialization of a low-environmental impact process for manufacturing chlorine using hydrogen chloride (HCl).

■ Hydrochloric Acid Oxidation Process



JCIA Responsible Care Award

Sumitomo Chemical received the Grand Award at the 17th JCIA Responsible Care Awards from the Japan Chemical Industry Association. This year's theme at the awards was contributing to carbon neutrality for society as a whole. The Company was lauded for its efforts to assess and reduce greenhouse gas (GHG) emissions with business partners and industry groups with the aim of realizing carbon neutrality for society as a whole. Examples include quickly working to calculate Scope 3 emissions, which is important for reducing supply chain emissions,*1 and providing a proprietary system for calculating Carbon Footprint of Product*2 to the public for free.

*1 The volume of emissions totaling all emissions related to business activities, not just the operator's own emissions. (Scope 1 emissions + Scope 2 emissions + Scope 3 emissions)
Scope 1: Direct emissions of GHGs from operators themselves (fuel combustion, industrial processes)
Scope 2: Indirect emissions arising from the purchase of electric power and heat from outside the plant
Scope 3: Indirect emissions other than Scope 1 and Scope 2 (emissions from other companies related to business activities)
*2 CFP: The CO_2 equivalent of GHG emissions from each stage of the product lifecycle, from the procurement of raw materials to manufacture, use, and disposal

Looking Ahead

In line with the Grand Design aimed at achieving carbon neutrality by 2050, which was released in December 2021, Sumitomo Chemical will leverage the technological capabilities and insights it has cultivated as a diversified chemical company to continue promoting initiatives to "fulfill its obligation" to realize zero Group GHG emissions and to "contribute" to the promotion of carbon neutrality throughout society via Group products and technologies.

Going forward, under Sumitomo Chemical's Business Philosophy of "working to contribute to society through our business activities," we will continue actively working to solve climate change problems and achieve carbon neutrality.

Contribute to Recycling Resources

Resource Saving and Waste Reduction

Basic Stance

Our lives are based on limited resources. For the sustainable use of resources, we need to reduce the consumption of natural resources while at the same time circulating those we already have. Sumitomo Chemical is working on waste management and the effective use of resources at our offices and works.

Management System

The President serves as the chief coordinator and the executive officer in charge of Responsible Care serves as the coordinator of the Environment and Climate Change Action Group of the Responsible Care Department. This group is responsible for matters related to environmental protection for the Company as a whole and supports the environmental protection activities of Group companies.

Our worksites (head offices, Works, research laboratories, etc.) have established sections in charge of environmental protection operations, appointed coordinators and managers, and execute specific duties. Regarding the execution of duties, the corporate department (Responsible Care Department) formulates Company-wide annual policies and Company-wide medium-term (three-year) policies. Then each worksite, in light of these policies and in consideration of its own characteristics and regional situation, formulates an action policy and undertakes specific activities from the new fiscal year.

Regarding amendments to laws and regulations, the Responsible Care Department vigilantly pays attention to trends related to the enactment and amendment of environmental laws and, as appropriate, provides feedback through national specialized committees and other organizations. All people addressing the problems also establish targets (details of the amendments, possible impacts, visualization of countermeasures, etc.) and commit the Company to addressing the issue being targeted.

Furthermore, with regard to amendments that have a large impact on business, we access the necessary information in advance and notify worksites to prepare for meeting compliance requirements.

P.89 Organization of Responsible Care

Examples of Initiatives

We are systematically working to reduce the amount of exhaustible raw materials used, quickly and properly dispose of PCB waste, and reduce the amount of industrial waste sent to landfills. Furthermore, we are setting targets related to recycling industrial and plastic waste and are promoting resource recycling initiatives.

Promoting Resource Saving

We are striving to enhance the economic benefits gained from resource saving activities, such as improving the throughput yield of exhaustible raw materials and product yield.

■ Exhaustible Raw Material Use (Sumitomo Chemical and Group Companies in Japan)

(Thousand tons)

	FY2020		FY2021		FY2022	
	Sumitomo Chemical and Group Companies in Japan	Sumitomo Chemical	Sumitomo Chemical and Group Companies in Japan	Sumitomo Chemical	Sumitomo Chemical and Group Companies in Japan	Sumitomo Chemical
Hydrocarbon compounds	1,704	1,449	1,713	1,429	1,684	1,421
Metals (excluding minor metals)	90.2	86.3	115	111	104	100
Minor metals	12.5	0.1	17.4	0.03	16.2	0.07

Note: Economic effects are detailed in the supplementary data (page 138)

Contribute to Recycling Resources

Thoroughly Managing Waste and Promoting Increased Recycling Internally and Externally

We have achieved a major reduction in industrial landfill waste by reducing the amount of industrial waste generated and promoting recycling. In addition, as a specified resource industry identified by the Act on Promotion of Effective Use of Resources, we are also working to reduce the generation of industrial byproducts (sludge). Furthermore, we are setting new targets related to recycling industrial and plastic waste from fiscal 2021 and are promoting resource recycling initiatives at each worksite and Group company.

Moving up the Schedule for the Treatment of Waste with Minute Amounts of PCBs before Legal Disposal Deadline Set by the PCB Special Measures Law

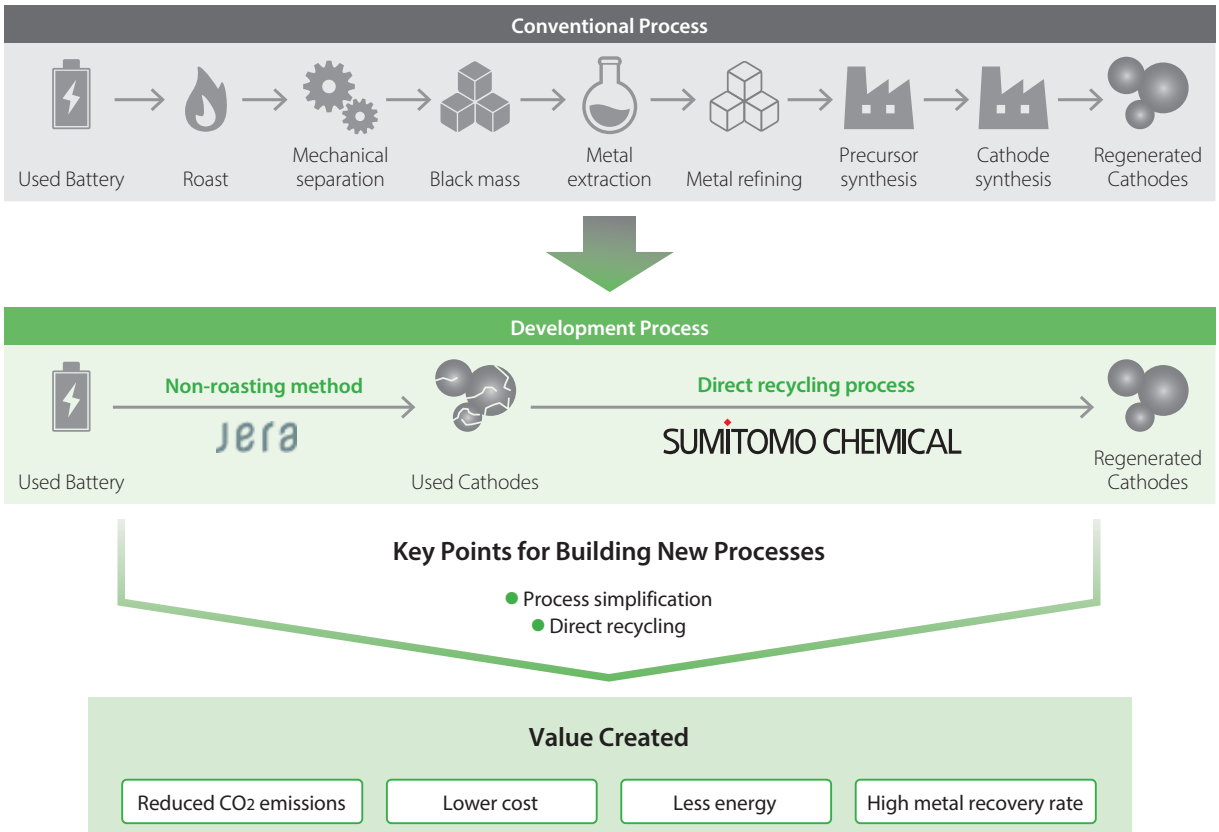
We winnowed the external operators jointly contracted to dispose of waste by Group companies in Japan down to just one. Regarding the waste with minute amounts of PCBs (transformers, condensers, etc.) being stored or used by each company, we formulated and are carrying out a plan to treat the waste over multiple years. We plan to treat all applicable equipment by March 2025.

Direct Recycling Initiatives for Battery Cathode Materials

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, CO_2 emissions are reduced and recycled cathode materials can be produced at low energy and cost. JERA Co., Inc. and we were selected for NEDO's* "Green Innovation Fund Project: Development of Next-Generation Storage Batteries and Next-Generation Motors". Both companies will promote development of the recycling technology and social implementation.

* New Energy and Industrial Technology Development Organization (NEDO)

■ Key Points of New Process Construction and Value Creation



Contribute to Recycling Resources

Circular System for Plastics

Basic Stance

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.

Sumitomo Chemical Group Basic Policy Towards a Circular System for Plastics

Recognizing that plastic is a useful material supporting a sustainable society, the Sumitomo Chemical Group is committed to work towards building a circular system for plastics and resolving plastic waste problems in accordance with its Basic Principles for Promoting Sustainability and the following policy:

1. The Group contributes to resolving plastic waste problems through its business, particularly by providing technologies, products and services that leverage the power of chemistry.
2. The Group focuses on innovation regarding 3Rs—reduction, reuse and recycling—of plastics and works to accelerate the adoption of new solutions by society, while also considering an impact on actions against climate change issues.
3. The Group takes on challenges difficult to resolve alone, such as marine plastic problems, by working with various stakeholders through alliances and open innovation partnerships.
4. The Group provides its employees with education and awareness-raising programs based on sound science, while also engaging in social actions, such as initiatives for promoting waste sorting and collection and riverside and beach cleaning campaigns, to ensure that every one of its employees has a sense of ownership and can change their actions as needed to address plastic waste problems.
5. The Group constantly reviews progress and works to enhance and improve its efforts by the Plan-Do-Check-Act (PDCA) cycle method.

(Formulated June 2020)

Management System

To promote R&D related to chemical recycling, in 2020 we established research groups that deal with technologies to reduce environmental impact at the Petrochemicals Research Laboratory (currently the Essential Chemicals Research Laboratory).

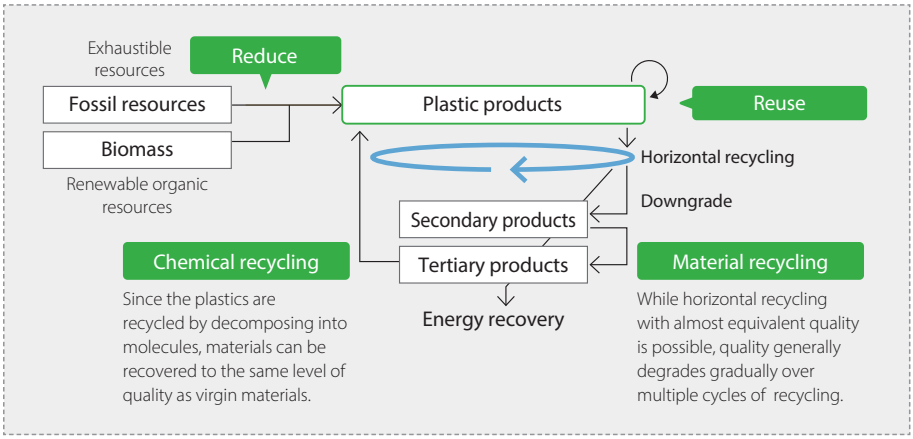
In pursuit of more practical, socially beneficial applications of this research, we are working to cultivate the market for plastic products made possible by securing and recycling plastic waste, especially through the Business Development Office for a Circular System for Plastics, which was established in 2021.

Contribute to Recycling Resources

Examples of Initiatives

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

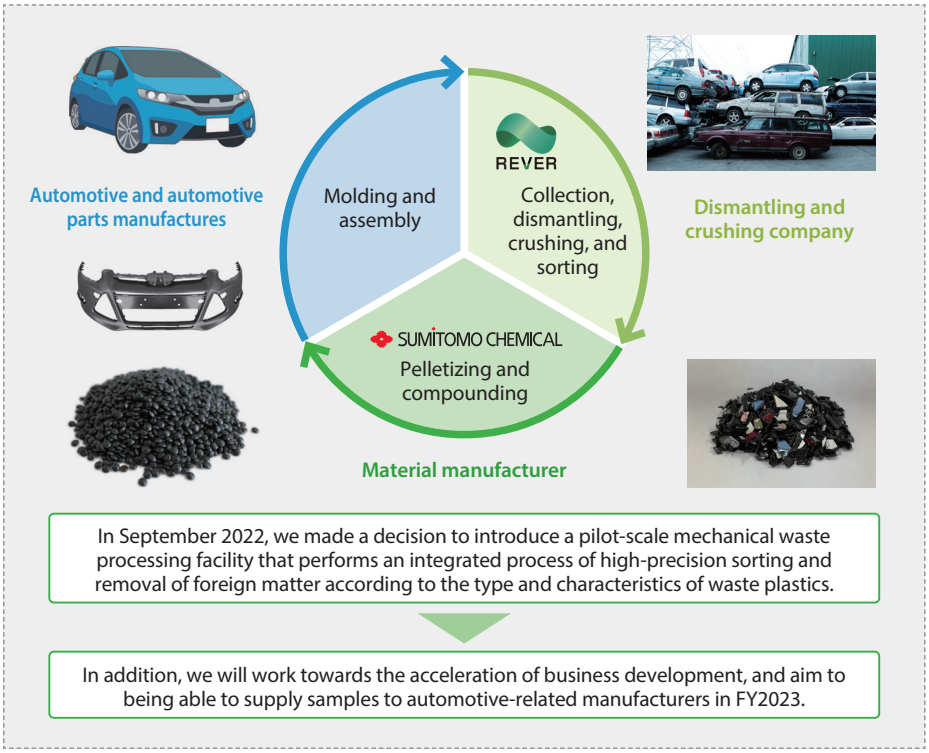
Overall Picture of Circular System for Plastics



Material Recycling

As one of our material recycling initiatives, Sumitomo Chemical and REVER CORPORARION have concluded a business alliance agreement for material 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.

Circular System



Contribute to Recycling Resources

Chemical Recycling

Sumitomo Chemical promotes 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.

Chemical Recycling System for Acrylic Resin

Sumitomo Chemical has jointly developed with The Japan Steel Works, Ltd. a technology for pyrolyzing acrylic resin and recycling it, with high efficiency, into MMA monomer, which is a raw material for acrylic resin (polymethyl methacrylate or PMMA). We have built the new pilot facility at Ehime Works and aim to supply samples in the fall of FY2023.

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

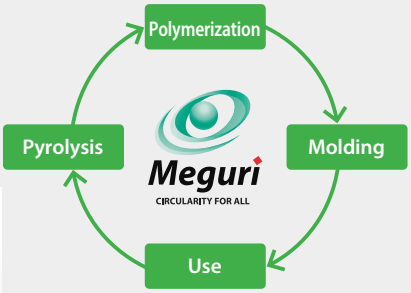
■ System for PMMA Chemical Recycling


MMA monomer


Acrylic resin


PMMA Waste


Molded article




PMMA Chemical Recycling Pilot Facility

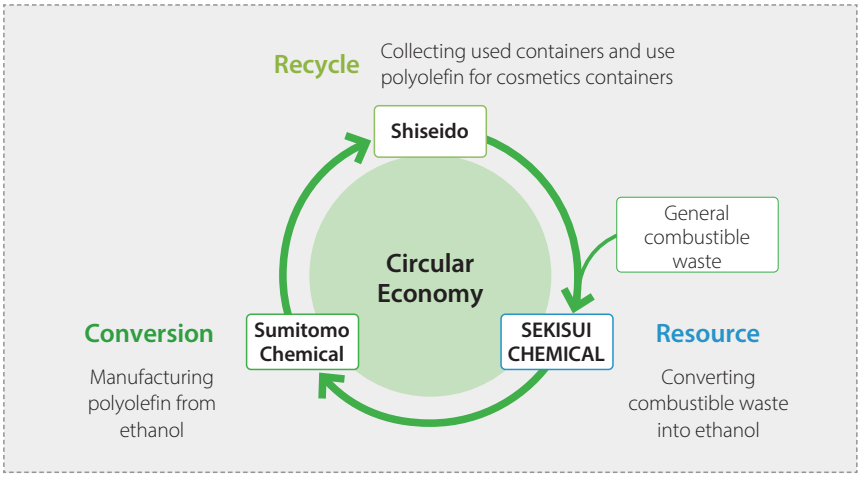

Molded product samples made from chemically recycled MMA monomer

Started Sample Production of Ethanol-Based Ethylene for Environmentally-Sustainable Polyolefin

Sumitomo Chemical completed the construction at its Chiba Works of a pilot facility to manufacture ethylene using renewable ethanol as a raw material, ethanol produced from waste by SEKISUI CHEMICAL CO., LTD. (SEKISUI CHEMICAL), and bio-ethanol derived from biomass, such as sugarcane and corn, and started manufacturing samples to develop the market, with the aim of contributing to creating a circular economy. We aim to commercialize ethanol-based polyolefin in FY2025 as an example of our efforts to build a new recycling model for plastic cosmetic containers through collaboration among the three companies, SHISEIDO CO., LTD. (SHISEIDO) and SEKISUI CHEMICAL.


Pilot facility to produce ethylene from renewable ethanol

■ Circular Economy Image of Initiatives



Contribute to Recycling Resources

Reduction of Plastic Used in Product Packaging and Use of Recycled Materials

With regard to feasible cases, including products, raw materials, production sites and other materials, Sumitomo Chemical Garden Products Inc. is working as swiftly as possible to adopt materials that reduce environmental burden and aims to switch over to 100% environmentally friendly products by 2030.

Soft packaging

The company is contributing to the reduction of the use of plastic.

Recyclable materials

The company is using recyclable PET.

The company is acting as a registered member of Plastics Smart (use and reduce plastic containers).

Plastics Smart

Initiatives of Sumitomo Chemical Garden Products for sustainability (Japanese only)

https://www.sc-engei.co.jp/sustainability/initiatives.html

Looking Ahead

Sumitomo Chemical identified contributing to recycling resources as a material issue to be addressed as management priorities. Going forward, to achieve greater progress, we will continue to further promote initiatives aimed at developing resource recycling technology and promoting practical, socially beneficial applications by leveraging the technological capabilities and insights we have cultivated as a diversified chemical company.

Sustainable Use of Natural Capital

Basic Stance

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 by 2030, we recognize that biodiversity conservation and sustainable use of natural capital are again material issues and we will make further initiatives.

We are 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.

Management System

Regarding the management system for the sustainable use of natural capital, please refer to Management System for Resource Saving and Waste Reduction (p.116).

P.116 **Contribute to Recycling Resources:** Management System

Sustainable Use of Natural Capital

★: Assured by an independent assurance provider

Goals and Results

The Sumitomo Chemical Group has established key environmental protection items as Common Targets. By following up on the results of each Group company, we are working to reduce our environmental impact in a systematic way.

P.101 Sustainable Use of Natural Capital

Environmental Performance

Sumitomo Chemical collects and totals environmental data for the Company and Group companies in Japan, including data on energy and resource consumption, production quantities, and environmental impact (e.g., release of pollutants into the air and water).

PP.134–136 FY2020–2022 Environmental Performance

■ FY2022 Primary Environmental Performance (Sumitomo Chemical and Group companies in Japan)

Figures in black: Sumitomo Chemical and Group companies in Japan
Figures in green: Sumitomo Chemical

INPUT Energy and Resources

Water ★

(Million tons)

Industrial water	69.5	66.5
Drinking water, etc.	0.8	0.5
Seawater	763	187
Groundwater	26.3	23.8
Other water	2.5	2.5

Energy ★
Calculated as kl of crude oil

(Thousand kl)

Fuel, heat, and electricity*1	1,634	1,014

Exhaustible Resources

(Thousand tons)

Hydrocarbon compounds	1,684	1,421
Metals (excluding minor metals)*2	104	100
Minor metals*3	16.2	0.07

PCB/CFCs under Secure Storage

No. of electrical devices containing high concentrations of PCBs*4	0 units	0 units
PCB volume*4	0 kl	0 kl
No. of refrigeration units using specified CFCs as a coolant	20 units	8 units
No. of refrigeration units using HCFCs as a coolant	277 units	84 units

OUTPUT Product Manufacturing and Environmental Impact

Products ★

(Thousand tons)

(Calculated on the basis of ethylene production)*5	2,413	1,353

Water Pollutant Emissions ★

(Tons)

COD	Coastal waters/waterways	825	775
	Sewer systems	175	101
Phosphorus	Coastal waters/waterways	32.0	30.2
	Sewer systems	6.1	5.3
Nitrogen	Coastal waters/waterways	1,236	1,170
	Sewer systems	47.8	25.1
Substances subject to the PRTR Act		13.3	10.9

Waste Materials ★

(Thousand tons)

Waste emissions*6	232	55.4
Landfill*6	21.9	1.8
(Breakdown)		
On-site landfill	0	0
External landfill	21.9	1.8

Atmospheric Emissions ★

(Thousand tons of CO_2e)

Greenhouse gases (seven gases)*1	5,418	3,321
CO_2 emissions from energy use	4,639	2,702
CO_2 emissions from other than energy use	633	593
CH_4	6	1
N_2O	137	22
HFC, PFC SF_6, NF_3	3	3

(Tons)

Others		
NOx	3,783	1,743
SOx	3,098	553
Soot and dust	167	100
Substances subject to the PRTR Act	404	236

*1 The energy (calculated as kl of crude oil) and greenhouse gas (all seven gases) indices were calculated based on the GHG Protocol (refer to page 238 "Calculation Standards for Environmental and Social Data Indicators") for principal consolidated Group companies in Japan, which account for up to 99.8% of consolidated net sales.
- Having adopted the GHG Protocol standards for our GHG emission disclosures, we now include the following data that was not included in previous calculations: amount of energy used to produce electricity and steam sold to external parties by the Group and the resultant CO_2 emissions; amount of energy used by Sumitomo Chemical and Group companies in Japan non-production sites and the resultant CO_2 emissions; CO_2 emissions from non-energy sources not included in the scope of the Act on Promotion of Global Warming Countermeasures.

*2 Calculations include the following 12 metals: iron, gold, silver, copper, zinc, aluminum, lead, platinum, titanium, palladium, gallium, and lithium.

*3 Calculations include the following seven minor metals: nickel, chromium, tungsten, cobalt, molybdenum, manganese, and vanadium. The supply structure for each of these minor metals is extremely fragile. These minor metals are subject to national stockpiling.

*4 Fluorescent lamps and mercury lamp ballast as well as contaminated substances (wastepaper, etc.), including PCB waste, are not included in unit and volume data.

*5 Certain assumptions were made in calculations due to the difficulty of obtaining weight-based figures for some products.

*6 The amount of coal ash generated at Sumitomo Joint Electric Power, which is included in "Waste emissions" and "Landfill" (Sumitomo Chemical and Group companies in Japan) is calculated on a dry-weight basis.

Sustainable Use of Natural Capital

Examples of Initiatives for "Obligation"

Each Group company and worksite sets targets in such fields as biodiversity preservation, atmospheric environment protection, effective water resource usage, sustainable soil usage, and appropriate chemical substance management. They are striving to enhance measures aimed at achieving the targets.

Biodiversity Preservation Initiatives

Working to preserve biodiversity is one of Sumitomo Chemical's most important pillars as it strives toward building a sustainable society. Since formulating Sumitomo Chemical's Commitment to the Conservation of Biodiversity, Sumitomo Chemical has strengthened its initiatives, including setting ISO 14001 activity goals for biodiversity preservation aligned with the Commitment at All worksites. The Company has been actively participating in a private-sector biodiversity partnership and promoting initiatives through business while giving considerable thought to what we should be mindful of as a chemical company.

生物多様性民間参画パートナーシップ
(Japanese only)

Sumitomo Chemical's Commitment to the Conservation of Biodiversity

1. We position the conservation of biodiversity as one of our most important management issues and strive to help protect the global environment.
2. We work to continuously reduce environmental impact in our production operations and our development and supply of products and services and in cooperation with third parties in the supply chain and thereby contribute to the conservation of biodiversity.
3. By regularly implementing education programs, we ensure that employees fully recognize and understand the importance of biodiversity and promote our commitment to its conservation.
4. We continuously engage in corporate social responsibility activities that contribute to environmental protection and lead to greater trust and confidence from society.
5. We disclose the results of these efforts and maintain effective communication with the general public.

Sumitomo Chemical's Biodiversity Preservation Initiatives

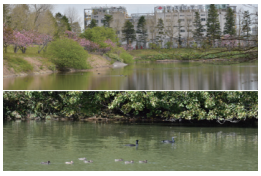
1. Reducing our environmental burden	2. Encouragement of conservation of environments where organisms live	3. Mainstreaming initiatives and alliances with stakeholders	4. Preventing climate change and effectively using resources
Considering the environment in business activities • Surveying benthic river organisms • Monitoring emitted water and gas, installing autonomous measuring equipment, and combatting odors through activated sludge treatment and activated carbon absorption • Undertaking environmental impact assessments at the planning stage for new plant construction and implementing countermeasures • Promoting the 3Rs and managing waste • Undertaking proper management of chemical substances • Complying with internal safety management regulations pertaining to the use of genetically modified organisms	**Improving the scenery and upgrading of environments where organisms live** • Conserving reservoirs and using them to promote biodiversity • Promoting the greening of each worksite's premises and neighboring areas • Taking countermeasures against white smoke (To render invisible the gas emitted (white smoke) after incineration to reduce, recycle, and detoxify waste and wastewater onsite, we have installed cooling equipment to condense the vapor.), we have installed cooling equipment to condense the vapor.)	**Alliances with stakeholders** • Participating in private partnerships for biodiversity • Incorporating marine plastic waste collection initiatives into management programs based on ISO 14001 • Supporting green curtain businesses • Supporting the Osaka plastic zero declaration • Participating in volunteer cleanup activities	**Saving energy, saving resources, and reducing greenhouse gases** • Conducting energy-saving activities based on ISO 50001 • Reducing CO_2 emissions (switching fuels, installing gas cogeneration systems, etc.)
Promoting "Sumika Sustainable Solutions" • Developing and promoting products with low environmental burden			
Relevant SDG targets: 7. a, 13.3	Relevant SDG targets: 6.3, 6.6, 14.1, 15.1, 9.4, 12.2, 12.4, 12.5, 11.6	Relevant SDG targets: 13.3, 15.1, 15.2	Relevant SDG targets: 11.6, 14.1, 14.2, 15.1, 15.2

Sustainable Use of Natural Capital

● Preserving the Environment of Sakuragaike (Misawa Works)

To prevent damage from heavy rains at Misawa Works, we created a retention pond that can store 50,000 tons of water. The pond (*ike*) was named Sakuragaike because of the cherry trees (*sakura*) planted in the surrounding area. Platanus, Sakhalin fir, double cherry, Sargent's cherry and other trees have been planted along its banks. Many different wild animals live around the pond, such as foxes, racoon dogs, and serows as well as a wide variety of birds, including ducks and cormorants.

To maintain Sakuragaike, we do not use synthetic chemical insecticides or germicides and instead regularly prune the trees of withered and diseased branches every three years.


Sakuragaike

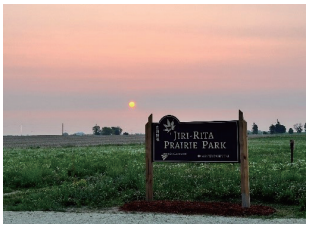

Double cherry


Left: Grey heron Right: Cormorants


Left: Rabbit Right: Bat

● Revitalizing Prairieland (Valent BioSciences LLC)

The Osage Plant of Valent BioSciences LLC, which is based in Iowa, U.S.A., is working to revitalize prairieland on its site, to this end replanting native vegetation on part of the farmland. The revitalized portion of prairie covers 1.4 hectares and supports ecosystems with native grasses, trees, and shrubs. It has become a habitat for endangered and other small creatures, including birds, butterflies and other insects, and reptiles. This initiative is being undertaken in partnership with Iowa State University, local municipalities, and local schools.



The revitalized prairieland on the Osage Plant

Protecting the Atmospheric Environment

By strengthening our measures for fixed emission sources, we are working on reducing our various environmental impacts, including emissions of soot and dust mainly from boilers and gas turbines, leaks of fluorocarbons from refrigeration equipment, emissions of mercury from industrial waste incinerators, emissions of chemicals and VOCs from manufacturing plants, and airborne asbestos from the demolition of buildings. In addition, we focus on realizing the following goals as an appropriate response to laws and regulations.

- Regarding refrigeration units using CFCs and HCFCs, we are systematically upgrading to equipment that uses low GWP HFCs or non-fluorocarbon refrigerants (Ozone Layer Protection Law). We are also steadily disposing of the fluorocarbons from refrigeration and air conditioning equipment to be thrown away. (Act for Rationalized Use and Proper Management of Fluorocarbons)
- We will remove all electronic equipment that uses PCBs (in storage or in operation) ahead of the deadline of March 2025. (Act on Special Measures against PCB Waste)

Reining in PM2.5* Emissions

We conduct detailed surveys of boilers, gas turbines, heating furnaces, dry furnaces, cracking furnaces, waste incinerators, and other such equipment, testing for emissions of VOCs and other gaseous atmospheric pollutants, soot, SOx, NOx, and hydrogen chloride, which are also the source of secondary particles and PM2.5. We strive to further reduce emissions for each source by taking measures to switch to alternative fuels.

* Particulate matter of up to 2.5 μm in diameter

P.139 Environmental Activities: Supplementary Data

Sustainable Use of Natural Capital

Responding to Fluorocarbon Emission Controls

① Initiatives to reduce leakage

We conduct twice annual fluorocarbon leakage surveys at all worksites to assess leakage amounts, identify equipment with significant leakage discovered during the assessment, and clarify the sources of leaks, then take measures to prevent recurrences. Specifically, in addition to the simple and regular inspections defined in the Act for Rationalized Use and Proper Management of Fluorocarbons, which we carry out as directed as a matter of course, we carry out more frequent inspections in order to quickly discover and minimize leakage.

HFO (R1233zd) refrigeration equipment

② Management for disposal

When disposing of equipment, to ensure fluorocarbon refrigeration equipment is properly treated, we diligently utilize disposal check sheets for Class I designated products so that there are no gaps in their management linked to fixed asset ledgers or in procedures for recovering fluorocarbons.

③ Systematic upgrades and use of green coolants

Regarding CFC and HCFC refrigeration equipment employed in production processes, we have set a target deadline for upgrading the equipment and conduct progress surveys once a year.

In addition, we are promoting a switch to green coolants at all Group companies in Japan, and Group companies in Japan and all worksites are promoting a switch to HFO refrigeration equipment.

● Upgrade Deadlines for Each Type of Equipment

- CFC equipment: Eliminate use of these units by fiscal 2025 (currently a total of 20 units held by the Group in Japan)
- HCFC equipment: Eliminate use of these units by fiscal 2045 (currently a total of 277 units held by the Group in Japan)

■ Calculated Leakage for Fluorocarbons

	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
Calculated leakage (tons-CO_2)	9,135	4,782	7,675	9,354	4,362	5,100	5,844

Emissions of Mercury into the Atmosphere from Waste Incinerators

We measured concentrations of mercury (both gas and particles) emitted into the atmosphere by our waste incinerators, which we own, and completed a study of the impact of these emissions. The results have confirmed that mercury is being effectively removed by emission gas removal equipment, including bag filters and scrapers installed at incinerators, and that the concentration of mercury released into the atmosphere from all of the incinerators we own is within the emission guideline value set under the Air Pollution Control Act.

Sustainable Use of Natural Capital

Effective Use of Water Resources

To maintain production at worksites and conserve nearby aquatic environments, we strive to appropriately manage wastewater, achieve more sophisticated activated sludge treatment, and promote effective water use based on water risk evaluations at each production base.

Protecting the Aquatic Environment

In addition to our initiatives aimed at reducing overall water use, we have realized thorough purification of wastewater from worksites by operating stable and sophisticated wastewater treatment facilities.

● Responding to Increasing Sophistication of Activated Sludge Treatment

At all Works, we are striving to develop management technologies for water treatment that will further reduce our environmental impact and apply these technologies to realize safe and secure wastewater treatment.

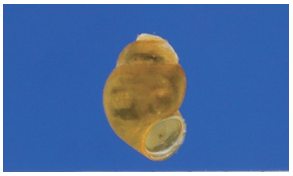
At Works, for process wastewater that is difficult to break down, which was conventionally incinerated for treatment, we have developed an activated sludge treatment utilizing microbial immobilization technology to stabilize the process water and reduce treatment costs. We are still considering applying this treatment to a wider scope of water.

P.112 Reduction of Process-derived GHG: Innovations in Wastewater Treatment Technology

● Water Area Surveys Conducted around Works (Misawa Works)

To confirm the impact of business activities on water areas, we conduct aquatic wildlife surveys of the Sabishiro River, into which process water from the Works flows.

In the Sabishiro River, we confirmed 10 species of precious aquatic benthic organisms, such as a vulnerable species of Stenothyra and the endangered species Cottus reinii. We determined that we were maintaining ecosystems with extremely good water quality.



Stenothyra

Cottus reinii

Dugesia japonica

A subspecies of *Tubifex tubifex*

● Responding to Water Quality Standards

We are strengthening our voluntary management to continually reduce the COD, nitrogen, and phosphorus in wastewater emitted into the ocean and waterways from wastewater treatment facilities. In addition, we have realized stable treated water quality by enhancing the management technologies used in our water treatment facilities. We are continually working to reduce the impact of water emissions from our plants on Tokyo Bay and other closed coastal waters where regulatory systems have been implemented to control the total water emissions of COD, nitrogen, and phosphorus.

● Promoting the Effective Use of Water

We investigate water risks related to intake, effluence and physical risk at each worksite and Group companies in Japan and overseas. We uncover various issues related to the use of fresh water on the worksite level and assess and manage the associated risks. In addition, we strive to reduce the amount of water we use by examining more effective ways to use water by application, while continuing to maintain and improve the quality of water released from our business sites into public water resources such as the ocean and waterways.

Sustainable Use of Natural Capital

★: Assured by an independent assurance provider

Water Usage (Sumitomo Chemical Group)

(Million tons)

	FY2020	FY2021	FY2022
Sumitomo Chemical Group	992	970	871
(Breakdown 1)			
Sumitomo Chemical	261	269	280★
Group companies in Japan	723	693	583★
Overseas Group companies	7.99	8.27	7.58
(Breakdown 2)			
Seawater	884	862	764
Fresh water	109	108	107

Note: Water usage volume includes seawater

Wastewater Detoxification Initiatives (Misawa Works)

Wastewater from the Misawa Works goes through general activated sludge treatment, then, after finishing tertiary treatment of activated carbon absorption and the removal of floating substances through coagulation and sedimentation, analysis equipment does quality checks and the water is released into public waterways.

Activated sludge treatment facility

Water risk assessment in areas where major production sites are located

Regarding maintaining production at production bases in the Sumitomo Chemical Group, we conduct water risk evaluations at each production base from the dual perspectives of physical water risks and water quality susceptibility risks.

● Evaluating Physical Water Risks

The Group evaluates the baseline water stress in communities where production bases are located as well as underground water stress, the severity of droughts caused by seasonal changes in the water supply, the water storage capacity of the drainage basin, projected changes in water stress, and the percentage of water resources in the drainage basin that are protected.

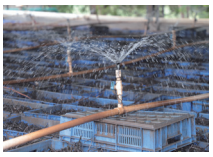
● Evaluating Water Quality Susceptibility Risks of Intake and Effluence

The Group evaluates susceptibility in terms of access to drinking water, water pollution, protected downstream areas, and the presence of endangered species in bodies of fresh water identified by the International Union for Conservation of Nature (IUCN).

● 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.



Water treatment at the Bhavnagar plant

Effective Use and Management of Yoshioka Springs (Ehime Works)

The name of Yoshioka Springs comes from the Yoshioka family's residence and pond. To provide water to the Kawahigashi district, which had been struggling with water shortages, the springs were created in 1917 by the local residents, and a canal was completed in 1921. After passing through the ownership of several companies, Sumitomo Chemical currently manages the springs.

The supply of water from Yoshioka Springs uses height difference and does not require an outside force. This important source of water for the Company is also used in districts throughout the city for irrigation. To preserve the aquatic environment, we remove weeds and clean the springs and grounds at Ehime Works around three times a week.

Present-day Yoshioka Springs

Sustainable Use of Natural Capital

Sustainable Use of Soil

We recognize that the conservation and restoration of soil is an important initiative to ensure the sustainable use of natural capital. In addition, as specific measures in line with the Soil Contamination Countermeasures Act, we maintain careful control of the execution and management of construction plans in order to ensure appropriate responses to notifications when modifying soil types at specified facilities that use hazardous substances and an expansion of opportunities for soil contamination surveys.

● Regularly Monitoring Groundwater

We analyze the groundwater at the boundaries of our worksites to confirm that levels of hazardous materials are below those stipulated by standards.

● Preventing Soil Contamination

We have established rules regarding the construction standards and the content of regular inspections for various equipment, including the gutters, floors, plumbing, and bund walls of facilities handling chemical substances. We are working to prevent soil contamination from leaks by thoroughly complying with these rules and to prevent the dispersal of hazardous substances outside of plant premises.

Appropriate Chemical Substance Management

Regarding Class I designated chemical substances (PRTR Act) and VOCs, we conduct environmental risk analyses regardless of the amount emitted into the environment. We are also taking measures to reduce use and emissions. In addition, as a specific response to the PRTR Act, for chemical substances expected to be newly designated under the PRTR Act, we have enhanced the evaluation and management of related environmental risks.

Meeting Voluntary Environmental Targets

At the boundaries of plant premises and at final drainage exits, we have set voluntary environmental targets for the concentration of pollutants in air and water and work to meet those targets. Utilizing METI-LIS provided by the Ministry of Economy, Trade and Industry, we simulate the atmospheric dispersion concentration of Class I designated chemical substances (PRTR Act) of plant premises and identify fixed emission sources that would effectively reduce concentrations.

Reducing Atmospheric Emissions (FY2022 results: atmospheric emissions accounted for around 97% of total air and water emissions)

We are, of course, taking measures to reduce emissions mainly by sealing facilities and improving operation methods. But we are also working to intently and systematically reduce atmospheric emissions primarily by additionally taking such disposal measures as recovering emissions through absorption, purification, and stronger cooling; incinerating emissions; and suppressing emissions through internal floating roofs for tanks.

Operating Company-wide PRTR Calculation Systems

Using the Company's proprietary calculation system, Sumitomo Chemical is striving to increase the accuracy and level of detail of the data on emission amounts and transfer amounts for each substance.

Sustainable Use of Natural Capital

Examples of Initiatives for "Contribution"

Focusing on responses at production sites, in fields concerning atmospheric, water and soil quality as well as waste disposal we will continue striving to achieve independent medium- to long-term targets going forward and promote unique initiatives at each worksite in line with the local characteristics.

Nature Preservation Initiatives

● Promoting 30by30

30by30 is a worldwide goal to effectively conserve at least 30% of Earth's land and sea areas as healthy ecosystems by 2030 with the aim of stopping the loss of biodiversity and reversing the trend. Sumitomo Chemical participates as an initial member in the 30by30 Alliance for Biodiversity, which comprises volunteer companies, municipalities, and organizations. We aim to certify the green spaces we manage as nature coexistence sites that contribute to the 30by30 goal and will continue further promoting the conservation of biodiversity.

● Participating in the "Conservation Site for Human-Nature Symbiosis" Certification Trial Program (Ehime Works)

The Miyoshima Area, which is on the site of Ehime Works, was originally an island in the Seto Inland Sea. In the Showa era, the expansion of the Works through land reclamation connected it to the mainland and it is now an onsite green area. Such rare species as peregrine falcons have been confirmed to be inhabiting the Miyoshima Area, and the area is therefore considered to have value in terms of biodiversity conservation. For this reason, in fiscal 2022 we participated in a pilot project under the Conservation Site for Human-Nature Symbiosis certification system, which Japan's Ministry of the Environment is promoting as a measure to achieve 30by30 in Japan. We earned an evaluation that is equivalent to certification. We will continue preserving the area as a green area and aim to achieve certification as a Conservation Site for Human-Nature Symbiosis.

The Miyoshima Area

Improvement of Soil Environment

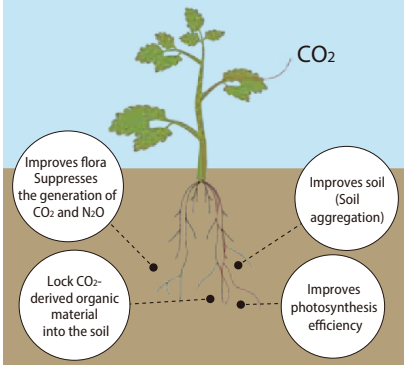
● Contributed to the Spread of No-till Farming

No-till farming is an agricultural method of growing crops without tilling, and is attracting attention from the perspective of reducing greenhouse gas (GHG) emissions by contributing to the reduction of CO_2 emissions from the ground, in addition to its significant environmental benefits such as soil protection and organic matter conservation. We have several herbicides suitable for use before sowing crops, and we will contribute to the spread of this farming method by ensuring the convenience of no-till cultivation through the promotion of these herbicides.

● Soil Fertility by Mycorrhizal Fungi

Mycorrhizal fungi, a type of soil-dwelling microorganism that lives in symbiosis with plant roots, stimulates plant growth by accepting carbon compounds produced by plants through photosynthesis. This property increases the amount of carbon compounds in the soil and promotes carbon fixation, thereby reducing atmospheric CO_2 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)



Sustainable Use of Natural Capital

Looking Ahead

The focus of Sumitomo Chemical Group's basic policy on protecting the environment has shifted since the early 2000s from responding to laws and regulations toward strengthening voluntary management. As pressure increases to protect the environment on a global scale and to improve the efficacy of the measures taken at each worksite, we think it is necessary to understand trends such as international environmental protection and resource recycling, biodiversity preservation, action on water risks and soil contamination better than ever and take forward-looking action.

From the perspective of continued risk management, we are focusing our efforts on issues that are assessed as being high risk over the medium to long term and take appropriate action that enhances voluntary management while continuing to contribute to the sustainable use of natural capital.