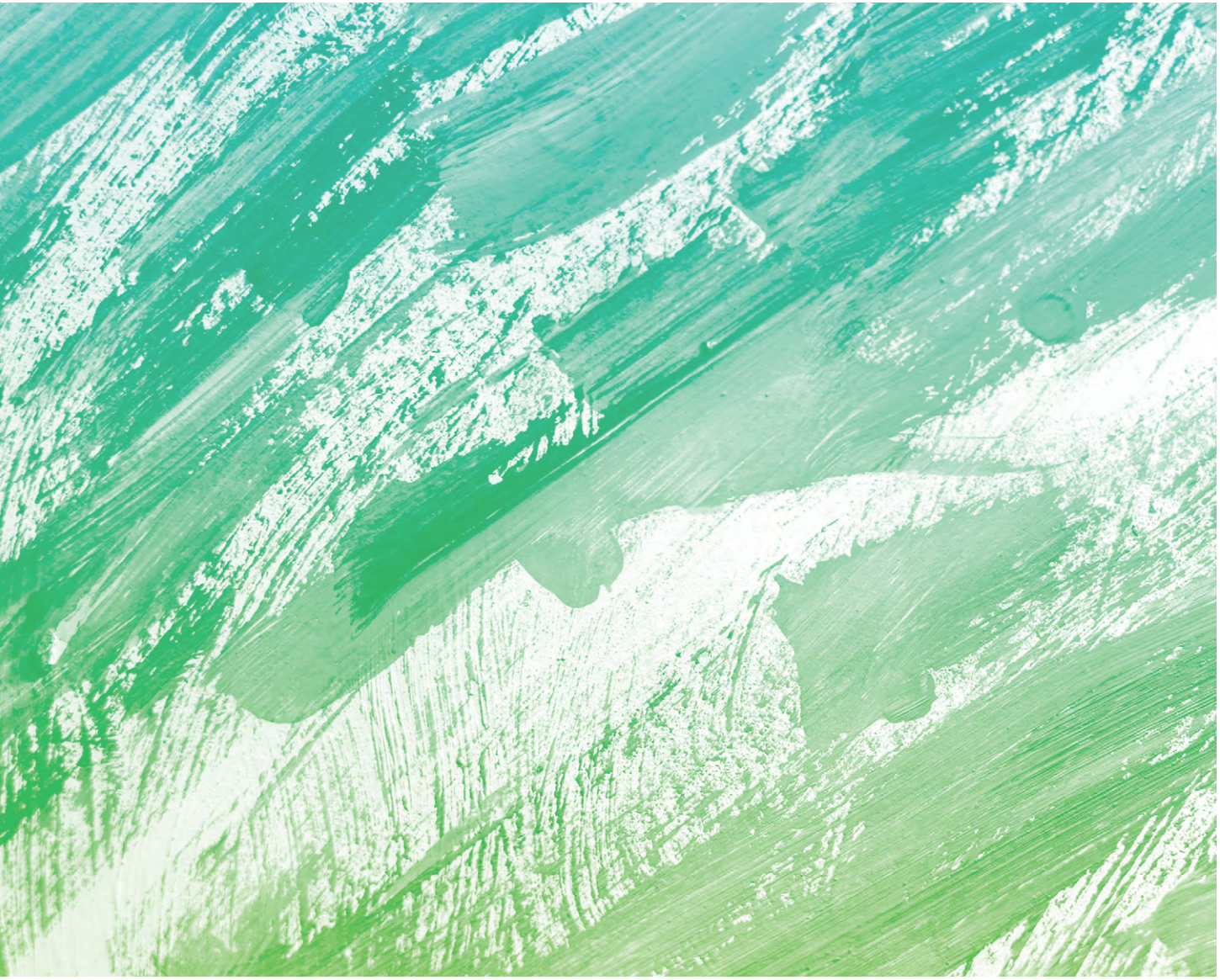
# Environment



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Contributing to the SDGs through Environmental Activities

# Environmental Activity Goals and Results

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

| Items | | Boundary | Goals | Fiscal 2023 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 32% relative to fiscal 2020 | ○ | Pages 082–094 |
| | Scope 3*2 | Sumitomo Chemical Group Consolidated | Reduce 14% relative to fiscal 2020 for categories 1 and 3*3 by fiscal 2030 | Reduced 19% 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 (using fiscal 2021 as the base year for fiscal 2022–2024). | Improved 13% 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 0.4% 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 108–109).
*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 2023 Goals | Fiscal 2023 Results | Evaluation | Fiscal 2024 Goals | Pages |
|---|---|---|---|---|---|---|---|
| Contribute to Recycling Resources | Promoting the effective use of plastic resources | Sumitomo Chemical and Group companies in Japan | Improve the amount of valuable resources and effective utilization*6 by 5% or more relative to fiscal 2020 by fiscal 2025. | Improved 15.2% relative to fiscal 2020 | ○ | Improve the amount of valuable resources and effective utilization by 5% or more relative to fiscal 2020 by fiscal 2025. | Pages 095–099 |
| | | Group companies overseas | Improve the amount of valuable resources and effective utilization*6 by 5% or more relative to fiscal 2020 by fiscal 2025. | Worsened 8.1% relative to fiscal 2020 | △ | Improve the amount of valuable resources and effective utilization by 5% or more relative to fiscal 2020 by fiscal 2025. | |
| | Reduce the amount of waste sent to landfills | Sumitomo Chemical and Group companies in Japan | Maintain waste volume at below fiscal 2020 levels to fiscal 2023 | Reduced by 40.2% relative to fiscal 2020 | ○ | Maintain waste volume at below fiscal 2020 levels to fiscal 2024 | |
| | Promoting the waste recycling and reuse | Sumitomo Chemical and Group companies in Japan | Improve the waste recycling and reuse rate*7 by 5% or more relative to fiscal 2020 by fiscal 2025. | Worsened 13.8% relative to fiscal 2020 | △ | Improve the waste recycling and reuse rate by 5% or more relative to fiscal 2020 by fiscal 2025. | |
| | | Group companies overseas | Improve the waste recycling and reuse rate*7 by 5% or more relative to fiscal 2020 by fiscal 2025. | Worsened 12.2% relative to fiscal 2020 | △ | Improve the waste recycling and reuse rate by 5% or more relative to fiscal 2020 by fiscal 2025. | |
| | 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<br>• 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<br>• 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: —<br>• 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 110–129).
*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 Waste recycling and reuse rate: (amount internally and externally reused + Amount of internally and externally recovered heat) / Waste emissions × 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)

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

| Items | | Boundary | Fiscal 2023 Goals | Fiscal 2023 Results | Evaluation | Fiscal 2024 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 | 0 | ○ | Meet voluntary management criteria | Pages 100–107 |
| | Addressing fluorocarbons | Sumitomo Chemical and Group companies in Japan | • Eliminate the use of refrigeration units that use CFCs as coolants by fiscal 2025<br>• 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<br>• Eliminate the use of refrigeration units that use HCFCs as coolants by fiscal 2045 | |
| | Addressing PRTR | Sumitomo Chemical | Due to changes in target substances following legal amendments, FY2023 is set as the base year | | — | Maintain emissions at or below the fiscal 2023 level | |
| | | Sumitomo Chemical and Group companies in Japan | | | — | Maintain total emissions of air and water pollutants at below fiscal 2023 levels | |
| | Reduction of VOC emissions | Sumitomo Chemical | Maintain VOC emissions reductions at 30% relative to fiscal 2000 | Reduced emissions by 61.8% 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 | Reduced usage 10.4% relative to fiscal 2022 | ○ | Promote effective and efficient use of water resources | |
| | | Group companies overseas | Improve unit water consumption by at least 1% on average per year | Improved 5.8% 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 | 0 | ○ | Keep hazardous materials strictly within Company premises | |

Note: Further details are provided in the supplementary data (pages 110–129).

*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.

**▶ Environmental Data (pages 080–129)**
Sumitomo Chemical's manufacturing sites and the production plants of major consolidated subsidiaries (23 companies in Japan and 33 companies overseas)
Principal consolidated Group companies, which account for up to 99.8% of Sumitomo Chemical's consolidated net sales for "Energy consumption and greenhouse gas emissions" (page 087).

**Sumitomo Chemical**
**Sumitomo Chemical:** All production sites of Sumitomo Chemical Co., Ltd.
**Sumitomo Chemical (all worksites):** All production and non-production sites of Sumitomo Chemical Co., Ltd.

**Group Companies in Japan**
**The production plants of 17 companies sharing the Common Targets** (Sumika-Kakoushi Co., Ltd.; Sumika Color Co., Ltd.; Sumika Plastech Co., Ltd.; Nippon A&L Inc.; Asahi Chemical Co., Ltd.; Ceratec Co., Ltd.; Sumika Assembly Techno Co., Ltd.; SanTerra Co., Ltd.; Sumika Agro Manufacturing Co., Ltd.; SC Environmental Science Co., Ltd.; Sumika Agrotech Co., Ltd.; Nihon Medi-Physics Co., Ltd.; Sumitomo Joint Electric Power Co., Ltd.; SN Kasei Co., Ltd.; Sumika Polycarbonate Ltd.; Sanritz Corporation; Sumika Kowa Tech Co., Ltd.). In addition to the 17 companies listed above, data not related to the Common Targets (as shown on page 126) include **the production plants of 5 other companies** (Koei Chemical Co., Ltd.; Taoka Chemical Co., Ltd.; Tanaka Chemical Corporation; Sumitomo Pharma Co., Ltd.) and Sumika High-Purity Gas Co., Ltd. for a total of 22 companies.

**Overseas Group Companies**
**29 companies sharing the Common Targets** (**Singapore:** The Polyolefin Company (Singapore) Pte.Ltd., Sumitomo Chemical Asia Pte Ltd (MMA&S-SBR) / **Thailand:** Bara Chemical Co., Ltd., Sumika Polymer Compounds (Thailand) Co., Ltd. / **Vietnam:** Sumika Electronic Materials Vietnam Co., Ltd. / **China:** Dalian Sumika Chemphy Chemical Co., Ltd., Sumika Electronic Materials (Wuxi) Co., Ltd., Sumika Electronic Materials (Hefei) Co., Ltd., Sumika Huabei Electronic Materials (Beijing) Co., Ltd., Sumika Electronic Materials (Xi'an) Co., Ltd., Zhuhai Sumika Polymer Compounds Co., Ltd., Dalian Sumika Jingang Chemicals Co., Ltd., Sumika Electronic Materials (Changzhou) Co., Ltd., Xuyou Electronic Materials (Wuxi) Co., Ltd., Sumika Electronic Materials (Chongqing) Co., Ltd. / **Taiwan:** Sumika Technology Co., Ltd., Sumipex Techsheet Co., Ltd. / **India:** Sumika Polymer Compounds India Co., Ltd. / **South Korea:** Dongwoo Fine-Chem Co., Ltd., SSLM Co., Ltd. / **Australia:** Botanical Resources Australia Manufacturing Services Pty Ltd., Botanical Resources Australia Agricultural Services Pty Ltd. / **United States:** Sumitomo Chemical Advanced Technologies LLC, McLaughlin Gormley King Company, Valent BioSciences LLC, Sumika Polymer North America LLC / **United Kingdom:** Sumika Polymer Compounds UK Co., Ltd. / **Turkey:** Sumika Polymer Compounds Turkey Co., Ltd. / **France:** Sumika Polymer Compounds France Co., Ltd.) In addition to the 29 companies listed above, data not related to the Common Targets (as shown on page 127) exclude Dalian Sumika Chemphy Chemical Co., Ltd. and include **5 other companies** (Sumitomo Chemical India Limited, Sumitomo Chemical Chile S.A., Sumitomo Chemical Brasil Indústria Química S.A., Sumika Polymer Compounds Poland Co., Ltd., Mycorrhizal Applications) for a total of 33 companies

Notes: • More detailed information about the boundary of data is listed on each page.
• Regarding affiliated companies and plants newly included in the boundary of environmental data reporting, results data are tabulated from the fiscal year when the survey was conducted as the Sumitomo Chemical Group

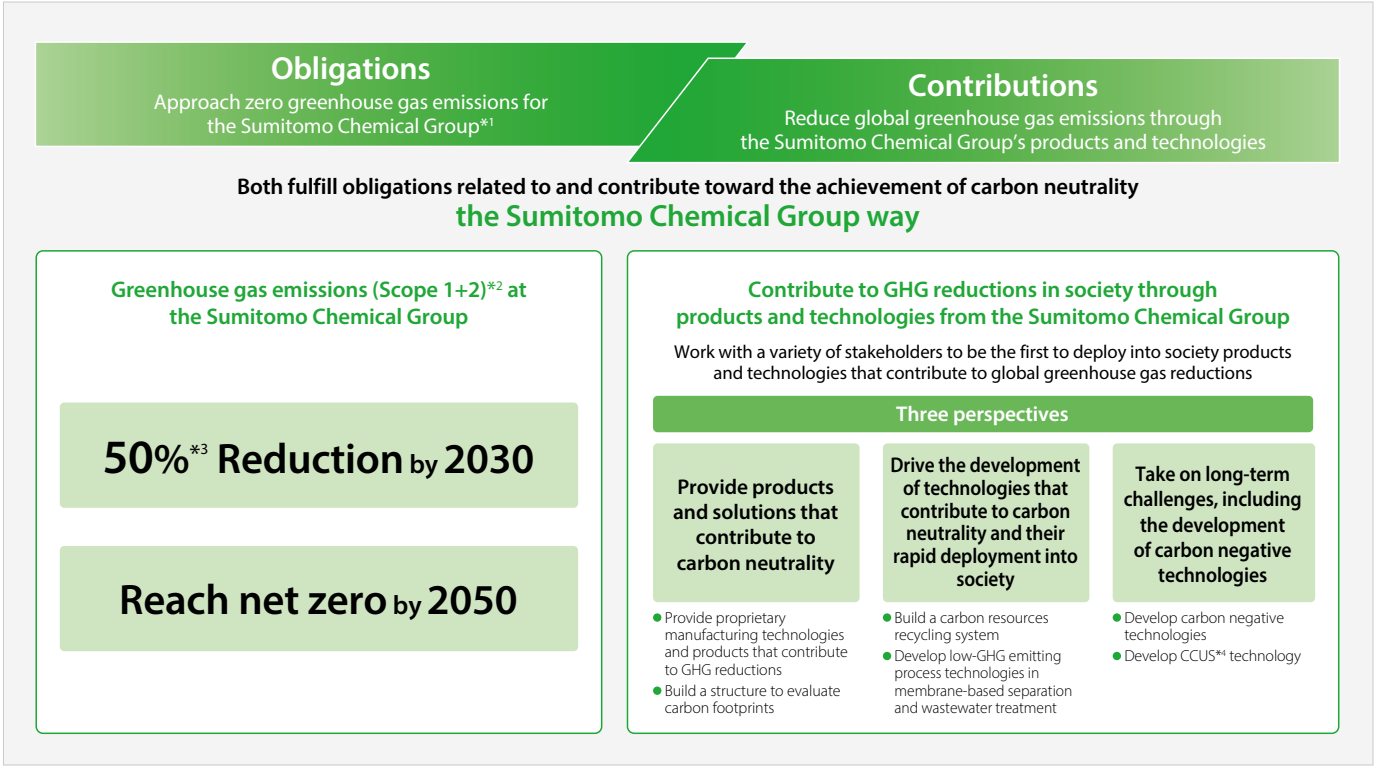
# Climate Change Mitigation and Adaptation

## 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




*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

## 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 83-94.

## 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

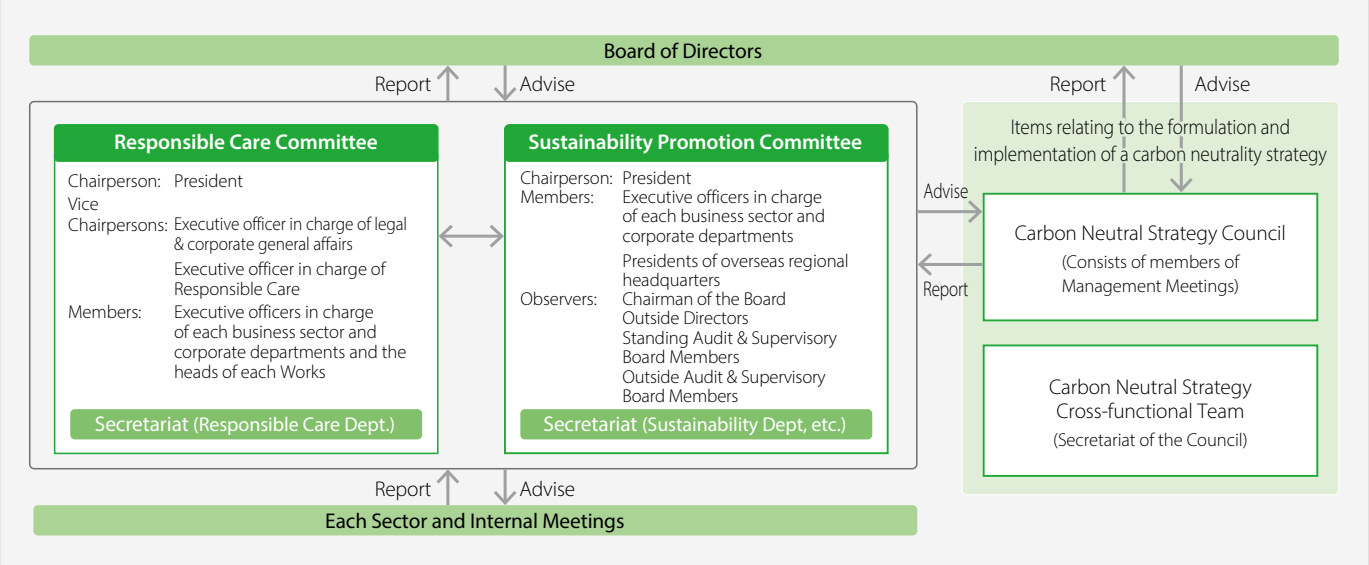
**Sustainability Promotion Committee:**
Deliberations on important matters related to sustainability promotion

**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

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.

### Structures for Responding to Climate Change




| 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 |

## 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.

P.060 Risk Management

■ 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

## 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.

## 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<br>● Increased demands for disclosure of the results of life cycle assessment<br>● 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<br>● Improved rating in stakeholder assessments with regard to the disclosure of the amount of GHG emissions reduction calculated by life cycle assessment<br>● Increased cost of compliance | ● Formulate and release our Grand Design for achieving carbon neutrality<br>● Disclose the amount of avoided GHG emissions (Science-Based Contributions)<br>● Develop a carbon footprint calculation tool (CFP TOMO®) and provide it to other companies for free<br>● 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<br>Examples<br>• Growing markets for EVs and fuel cell vehicles (2020 to 2050)<br>• 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)<br>• Shift to low-carbon energy sources<br>• Expansion of CCUS*2 (2030 onward)<br>• Expansion of the circular economy, with the aim of reducing GHG emissions derived from fossil fuels (2020 to 2050)<br>• Growing markets for energy-saving homes and building materials | ● Increased demand for SSS*3-designated products<br>● Increasing need for technological development for future SSS-designated products<br>Examples<br>• Components and materials for EVs and fuel cell vehicles<br>• 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<br>• Technology that contributes to reducing GHG emissions<br>• Products and technologies for $CO_2$ recovery, on the back of the expansion of CCUS<br>• Carbon negative technologies<br>• Recycling-related products and technologies<br>• Biologically derived products and technologies<br>• 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<br>● Develop a process for recycling lithium-ion batteries<br>● Enhance development and production systems for materials for next-generation power devices and high-efficiency communications<br>● Promote licensing of technologies that contribute to reducing GHG emissions (for example: the hydrochloric acid oxidation process and the propylene oxide-only process)<br>● Develop technologies relating to $CO_2$ recovery<br>● Develop products that contribute to negative carbon emissions (for example: agricultural materials utilizing fungi, resins produced from microbes)<br>● Develop plastic recycling technology and build a recycling chain in cooperation with waste management companies<br>● Develop technology for biologically derived products<br>● Develop technology for and expand sales of heat storage material products<br>● 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 5.03 million tons/year (Scope 1+2), the same level as in fiscal 2023, and a carbon price between 21,000–37,000 yen per ton of $CO_2$, our expense burden will increase by about 110-190 billion yen per year.) | ● Consider carbon-neutral petrochemical complexes and ports<br>● Switch to highly efficient equipment by actively utilizing government subsidies<br>● Switch to renewable energy<br>● Switch fuel to LNG<br>● Rationalization research for manufacturing processes |
| | | ● Stronger requirements for GHG emissions reductions and making energy-saving performance mandatory<br>● Phased abolishment of subsidies for fossil fuels (in India and Southeast Asia, etc.)<br>● Accelerating transition to a circular society and increased regulation<br>● Increase in calls to promote use of renewable energy from customers | ● Lower utilization of high-energy consumption production facilities<br>● Increase in utility expenses due to an increased proportion of renewable energy | ● Develop technologies to capture, separate, and utilize GHG, and deploy them in society<br>● Promote the deployment of GHG emission removal equipment<br>● Collaborate with other companies to secure a stable supply of clean ammonia |
| | **Increased Cost of Raw Materials** | ● More use of resources from circular systems and progress in the transition to lower environmental impact processes<br>● Increased costs due to more use of recycled materials<br>● Increase in calls for green procurement | ● More difficult to procure raw materials<br>● Lower profitability of the existing businesses | ● Diversify raw material sources<br>● Evaluate the use of recycled raw materials<br>● Evaluate self-manufacture of raw materials with unstable supply<br>● Shift to a local production, local consumption model (for products where raw material procurement costs make up a relatively high proportion of the price) |

*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 2023

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

| Scenario | Risks and Opportunities | Anticipated Situation (Example) | Impact Assessment | Action |
|---|---|---|---|---|
| 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<br>● Spread of infectious diseases due to the impact of climate change | ● Increased demand for SSS-designated products<br>● Increased need for technological development for future SSS-designated products<br>Examples<br>• Biorationals and soil amendments<br>• Agrochemical products adaptable to the change in crop growth<br>• Agents for prevention and treatment of infectious diseases | ● Develop products such as biorationals<br>● Provide solutions that respond to global changes in the environment for agriculture and infectious diseases<br>● 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<br>● Rising sea level, damage from storm surges and floods, and heat waves<br>● Damage to farmland due to droughts and soil degradation | ● Facilities located on seashores and river banks cease operations<br>● Decreased cost competitiveness of plants due to increased costs for measures to be prepared for disasters<br>● Decreased demand due to lower agricultural productivity | ● Manage and respond to risks from a business continuity planning perspective<br>● Expand and diversify the regions in which we do business |

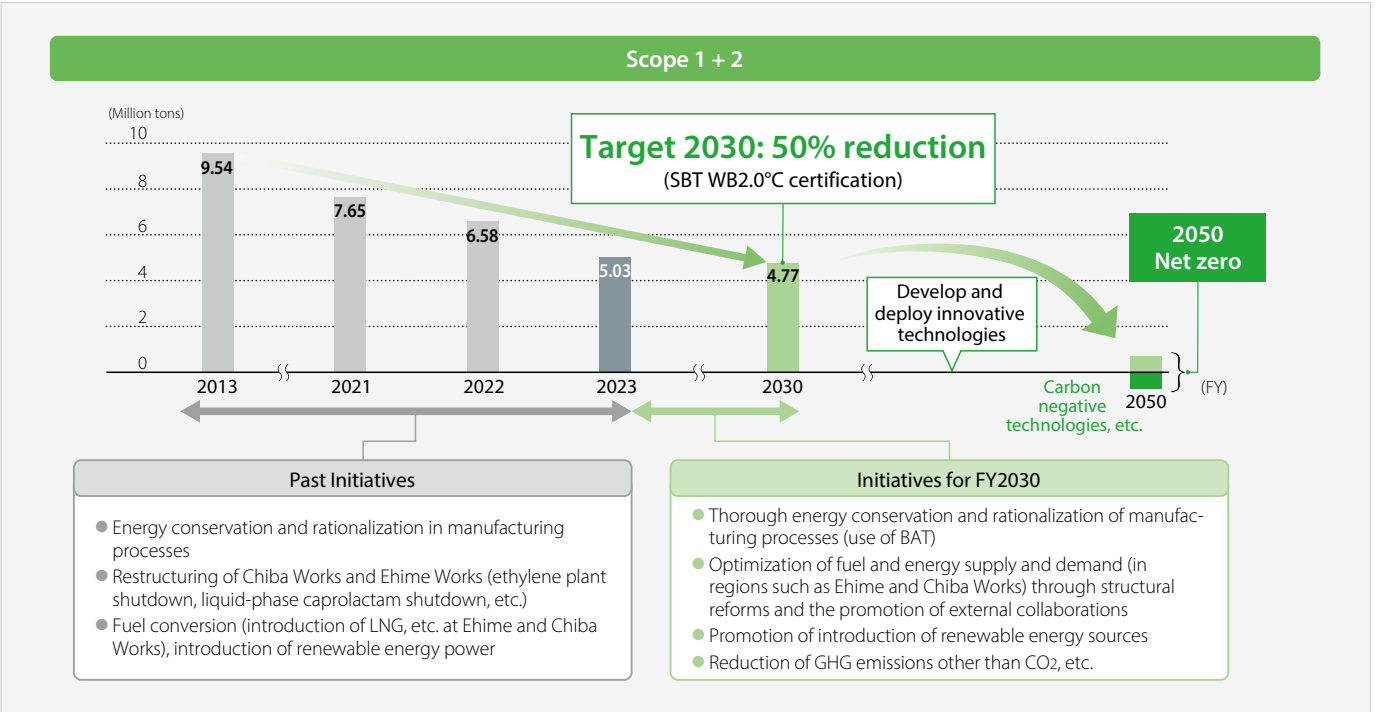
## Metrics and Targets (Risk)

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

★: Assured by an independent assurance provider

## FY2023 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 197 "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.

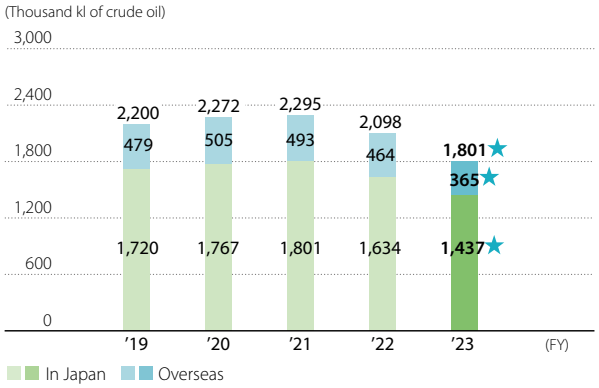
### Greenhouse Gas Emissions ★

(Thousand tons of $CO_2e$)

| | Sumitomo Chemical and Group Companies in Japan | Overseas Group Companies | Total |
|---|---|---|---|
| Scope 1 | 3,995 | 267 | 4,262 |
| Scope 2 | 124 | 642 | 767 |
| Total | 4,119 | 910 | 5,029 |

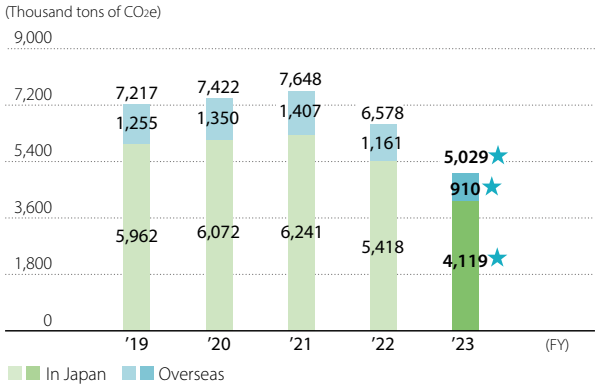
Note: Biomass-derived emissions were 0.6 thousand tons of $CO_2e$

### Energy Consumption (GHG Protocol standards)



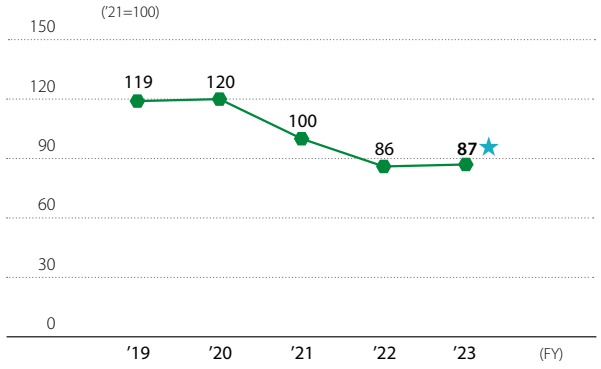

Note: • In line with the GHG Protocol standards, we now include the amount of energy consumed in the production of power and steam sold to external parties by Sumitomo Chemical Group.

### Greenhouse Gas Emissions (GHG Protocol standards)




Note: • Having adopted the GHG Protocol standards for our GHG emission disclosures, we now include the following data: $CO_2$ 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.

### 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)

★: 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 2024, we held a hybrid face-to-face and web-based meeting with 53 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 five consecutive years.

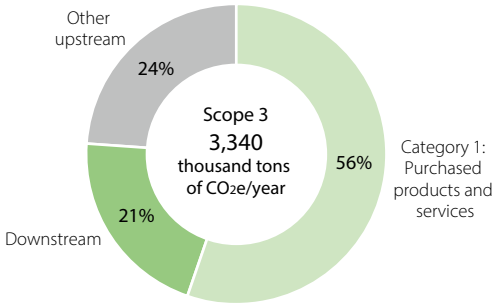
CDP SUPPLIER ENGAGEMENT LEADER 2023

### Status of Scope 3 GHG Emissions

(Thousand tons of $CO_2e$/year)

| Category | Emissions | | | |
|---|---|---|---|---|
| | FY2020 | FY2021 | FY2022 | FY2023 |
| 1. Purchased goods and services | 2,346 | 2,441 | 2,261 | 1,858★ |
| 2. Capital goods | 164 | 141 | 146 | 186 |
| 3. Fuel- and energyrelated activities (not included in scope 1 or scope 2) | 585 | 559 | 550 | 512★ |
| 4. Upstream transportation and distribution | 53 | 55 | 53 | 50★ |
| 5. Waste generated in operations | 41 | 58 | 37 | 33★ |
| 6. Business travel | 2 | 3 | 7 | 6 |
| 7. Employee commuting | 11 | 9 | 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 | 42 | 45 | 34 | 24★ |
| 12. End-of-life treatment of sold products | 806 | 788 | 772 | 662 |
| 13. Downstream leased assets | — | — | — | — |
| 14. Franchises | — | — | — | — |
| 15. Investments | — | — | — | — |

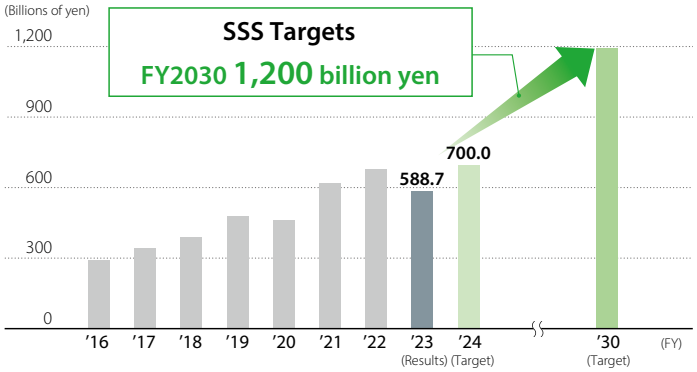
Notes:
- For Scope 3 data, indirect greenhouse gas emissions from business activities throughout the supply chain are calculated separately by category and then added together.
- Calculated for Sumitomo Chemical and Group companies listed on stock indices in Japan (Sumitomo Pharma Co., Ltd.; Koei Chemical 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 $CO_2$



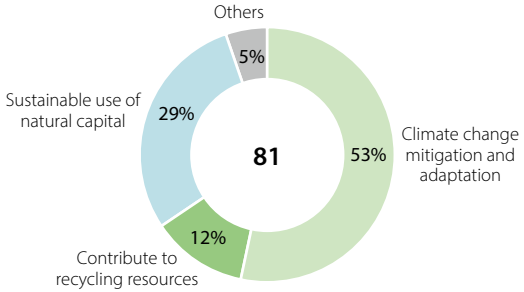
## Metrics and Targets (Opportunities)

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 climate change mitigation and adaptation, contribute to recycling resources, and sustainable use of natural capital in order to promote their development and spread. The sales revenue from certified products for FY2023 reached 588.7 billion yen. We will continue to advance our efforts towards achieving the FY2030 target of 1.2 trillion yen.

### Sumika Sustainable Solutions' Sales Revenue Targets




### Percentage of products and technologies in each certified field (FY2023)




Note: Number of SSS certified products and technologies 81

## 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.

**SBC results** FY2022 **8.3 million tons** FY2023 **7.1 million tons**

| Item | | Beneficiaries | FY2022 (million tons) | FY2023 (million tons) |
|---|---|---|---|---|
| SSS Technology | Propylene oxide (PO)-only process, Hydrochloric acid oxidation process | Licensees | 2.7 | 2.7 |
| SSS End Products | Methionine, Flumioxazin, etc. | Users | 5.6 | 4.4 |
| 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.

* In addition to the SBC, we conduct assessments of some products using the Life-cycle Impact assessment Method based on Endpoint modeling (LIME).

Sumika Sustainable Solutions

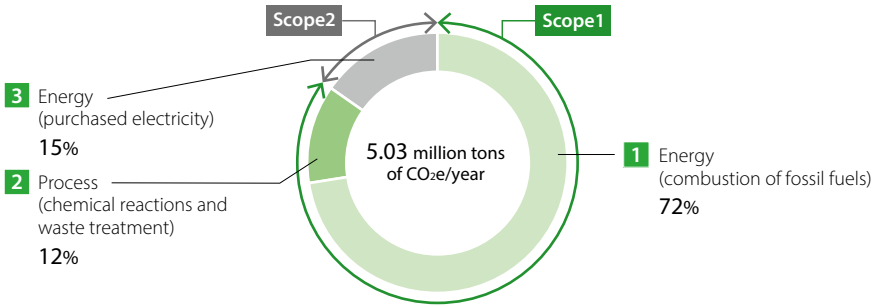
https://www.sumitomo-chem.co.jp/english/sustainability/management/promotion/sss/

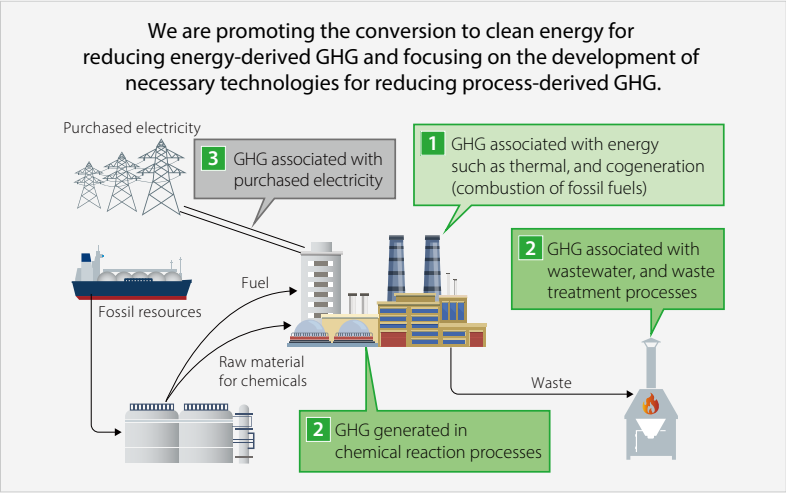
## Specific Initiatives for "Obligation"

### 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. In FY2023, 72% of our GHG emissions came from 1 Energy (combustion of fossil fuels), 12% from 2 Process (chemical reactions and waste treatment), and 15% from 3 Energy (purchased electricity). We aim to reduce GHG emissions by focusing on the conversion to clean energy for energy-derived GHG and on the development of necessary technologies for process-derived GHG.

■ GHG Emissions in FY2023




### 1 Reduction of GHG Emissions from Energy (combustion of fossil fuels): 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. These efforts will result in a 650,000-ton annual reduction in $CO_2$ emissions. In January 2024, we began operating highly efficient gas turbine power generation equipment at Chiba Works that uses LNG instead of the existing petroleum coke. With the construction of this equipment, we will 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

■ Fuel Conversion and $CO_2$ Emissions Reduction

**Ehime region**

**Fuel conversion:** Coals and heavy oil ▶ **LNG**

**Amount of $CO_2$ reduction:** **650,000** tons/year

Niihama North Gas-Fired Power Plant

Niihama LNG Terminal and Ehime Works

**Chiba region**

**Fuel conversion:** Petroleum coke ▶ **LNG**

**Amount of $CO_2$ reduction:** **240,000** tons/year

Chiba Works' highly efficient gas turbine power generation equipment

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

### Transition to Clean Fuels

Hydrogen and ammonia are gaining attention as clean fuels that do not emit $CO_2$ during combustion, with ammonia also being recognized as a hydrogen carrier. Our company is undertaking the following initiatives in this regard.

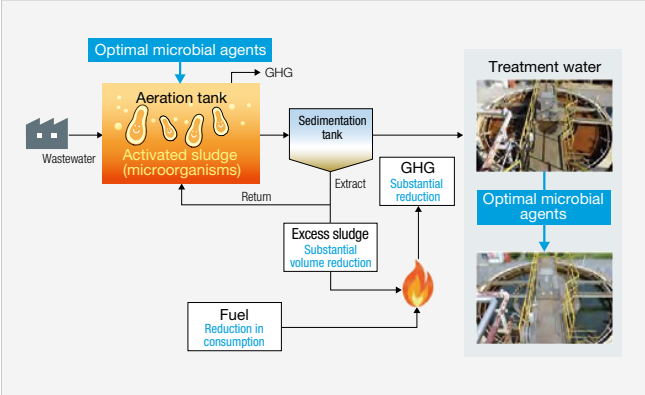
- Focused on clean ammonia (blue and green), we are continuing discussions with Yara, a major foreign ammonia manufacturer, regarding the possibility of its stable procurement.
- Four domestic ammonia suppliers, UBE Corporation, Mitsui Chemicals, Inc., Mitsubishi Gas Chemical Company, Inc., and Sumitomo Chemical are continuing joint discussions to secure a stable supply of clean ammonia.
- We are participating in regional collaboration initiatives aimed at building a supply chain for ammonia and hydrogen as fuels.

P.093 Climate Change Mitigation and Adaptation: Initiatives through Regional Collaboration

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 GHG Emissions from process (chemical reaction and waste treatment): Innovation 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, however there was the issue that it requires a lot of energy and causes GHG emission when incinerating excess sludge. 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 GHG Emissions 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% compared to fiscal 2013 at the Works.

### 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.

### 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.

### Chiba Works: Introduction of EV Bus

At Chiba Works, we introduced EV bus for commutes and for moving between plants. The purpose is to help reduce $CO_2$ emissions and raise awareness of carbon neutrality among employees. The body of the bus is wrapped in a design that was solicited from employees. In the near term, we plan to use renewable energy when charging the bus and, going forward, intend to use it for more than just transportation. For example, it can be used as emergency power source at times of natural disaster as well as for a wide range of other applications.

EV bus

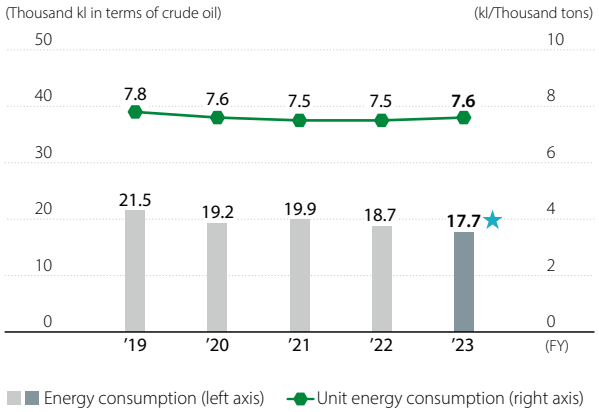
★: Assured by an independent assurance provider

### Logistics Initiatives

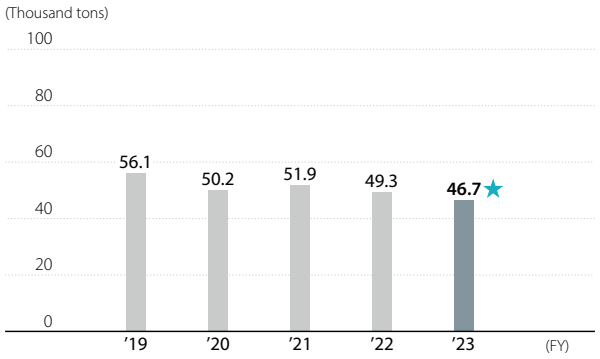
Sumitomo Chemical continues to promote modal shift, or transportation by more efficient and environmentally friendly modes, such as rail and ship instead of trucks. In fiscal 2023, the overall volume of cargo transported fell year on year, and, as a result, energy consumption (crude oil equivalent) and carbon dioxide emissions decreased. However, unit energy consumption increased 0.9% overall due to a rise in coastal transportation. This was an average 0.4% 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



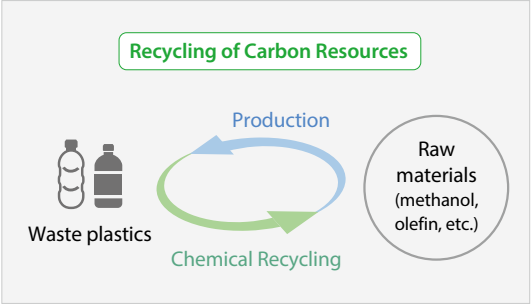

Note: Calculated for Sumitomo Chemical and a Group company in Japan (specified consigner Nippon A&L Inc.)

## 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.

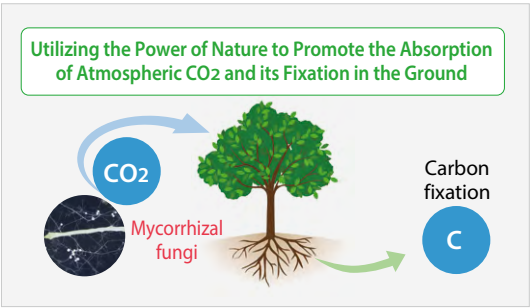
P.095 Contribute to Recycling Resources




### Challenges to Carbon Negative Emissions

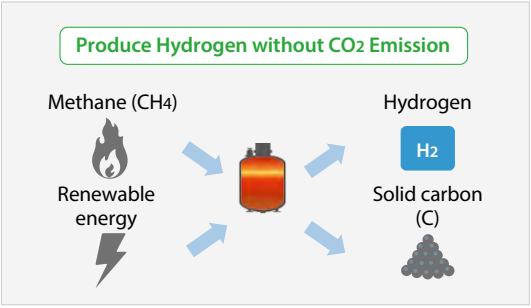
We are developing a technology whereby attaching useful micro-organisms existing in soil to the roots of plants and allowing them to coexist, we not only promote the absorption of $CO_2$ by plants through photosynthesis, we also fix $CO_2$ in the ground in the form of carbon compounds. This will enable 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.100 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

### 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. In the Shikoku and Setouchi region, we are collaborating on efforts to construct a clean ammonia supply chain by participating in "the Council for Utilizing Namikata Terminal as a Hub for Introducing Fuel Ammonia", which was launched primarily by Mitsubishi Corporation and Shikoku Electric Power Company.

The existing terminal operated by Namikata Terminal Co., Ltd.
(Imabari City, Ehime Prefecture)

We are proceeding with the study about the port decarbonization plan which is currently promoted by government agencies in cooperation with the local community.

## External Cooperation Initiatives

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

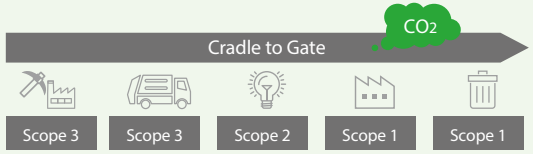
Although the evaluation of product CFP is essential to reduce GHG emissions in society, it is not easy to analyze the CFP of chemical products due to the complexity of their manufacturing processes. In response, we have developed our own automated calculation tool and calculated the CFP of approximately 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 110 companies are using the tool, and we have also started collaboration with the Japan Chemical Industry Association. Additionally, we are considering expanding the use of CFP-TOMO® for assessing environmental impacts other than GHG emissions, such as water.

* 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.




- **Received the Ministry of Economy, Trade and Industry's Industrial Science, Technology and Environment Policy Bureau Chief's Award**

The Japan Chemical Industry Association (JCIA) and Sumitomo Chemical were jointly awarded the Ministry of Economy, Trade and Industry's Industrial Science, Technology and Environment Policy Bureau Chief's Award, the highest award at the 20th Life Cycle Assessment Society of Japan (JLCA) Awards. JCIA formulated and published CFP calculation guidelines for the chemical industry while, for its part, the Company developed CFP-TOMO™, a tool for simply and efficiently calculating the CFP of chemical products that it provides free of charge, and over 100 companies are currently using the tool. JCIA and the Company were praised for their significant achievements in working together to further the efficacy of efforts to realize carbon neutrality throughout society.


Representatives receiving the award: Hideo Shindo, Director General of JCIA (left) and Hiroshi Ueda, Vice President of Sumitomo Chemical (back)

JCIA and Sumitomo Chemical jointly receive the highest award at the JLCA Awards (Japanese only)

https://www.sumitomo-chem.co.jp/news/detail/20240123.html

- **Simultaneously Received the Minister of Economy, Trade and Industry's Award and the Minister of the Environment's Award**

Sumitomo Chemical simultaneously received the Minister of Economy, Trade and Industry's Award and the Minister of the Environment's Award at the 23rd Green Sustainable Chemistry Awards hosted by the Japan Association for Chemical Innovation (JACI) for its development and promotion of a carbon footprint calculation tool for chemical products. These awards were given with high praise for the Company's development of CFP-TOMO™, a Carbon Footprint of Products (CFP) calculation tool suited to the chemical industry, as well as for how its efforts to provide the tool free of charge to other companies have contributed to the advancement of the chemical industry and the reduction of environmental impacts. By providing CFP-TOMO™, we have promoted the understanding of CFP calculation methods among chemical companies and significantly reduced the work needed to determine CFP. This has, in turn, encouraged CFP disclosures across the entire chemical industry.

Representatives receiving the award

23rd Green Sustainable Chemistry Awards
Received both the Minister of Economy, Trade and Industry's Award and the Minister of the Environment's Award
-Significantly contributed to the widespread adoption of CFP calculation for chemical products Prefecture- (Japanese only)

https://www.sumitomo-chem.co.jp/news/detail/20240618.html

# Contribute to Recycling Resources

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

## Circular System for Plastics

### Basic Stance

To realize a circular system for plastics, we are working to reduce, reuse, and recycle (mechanical recycling, chemical recycling) products at each stage of the plastic value chain.

In addition, the Group formulated the Sumitomo Chemical Group Basic Policy Towards a Circular System for Plastics in 2020 to work towards building a circular system for plastics and resolving plastic waste problems.

Sumitomo Chemical Group Basic Policy Towards a Circular System for Plastics

https://www.sumitomo-chem.co.jp/english/news/files/docs/20200601e_policy.pdf

### 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 and renamed the Business Development Office for Circular Carbon Economy in April 2024.

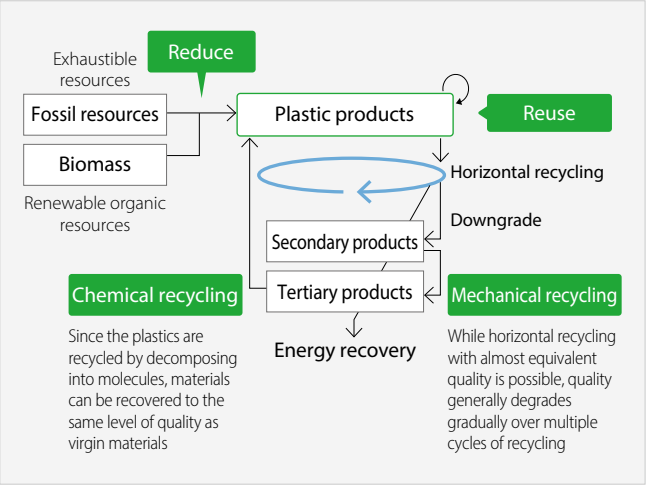
### Targets and Results

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

| KPI: The amount of recycled plastics utilized in manufacturing processes | |
|---|---|
| Target | **200k** tons/year by 2030 |
| Result | FY2023 Approximately **7,300** tons |

### Examples of Initiatives

■ Overall Picture of Circular System for Plastics




**Development of the Meguri® brand**

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

Meguri
CIRCULARITY FOR ALL

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

## Chemical Recycling

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

■ Examples of chemical recycling through collaboration with other parties

| | Technology | Cooperating Partners | Reference |
|---|---|---|---|
| ① | Polyolefin production from waste-derived ethanol | SEKISUI CHEMICAL CO., LTD. | Completion of test production facility in April 2022 |
| ② | Direct olefination of waste plastics | Maruzen Petrochemical Co., Ltd.<br>Muroran Institute of Technology | NEDO*1<br>GI Fund Projects*2<br>(Project scale: approx. 25.30 billion yen) |
| ③ | Ethanol production using synthesis gas derived from waste plastics | National Institute of Advanced Industrial Science and Technology (AIST) | |
| ④ | Efficient alcohol production from $CO_2$ | AIST<br>Shimane University | NEDO<br>GI Fund Projects<br>(Project scale: approx. 24.08 billion yen) |
| ⑤ | Olefin production from alcohols | AIST | |

Explanation of items ④ and ⑤ continues below.

### ④ CCU Technology for Producing Methanol from $CO_2$

NEDO | GI Fund Projects

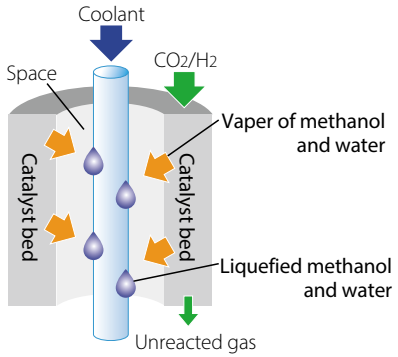
We have completed the construction of a pilot facility to establish a highly efficient process for producing methanol from $CO_2$ at our Ehime Works and have commenced operations at the facility. Carbon capture and utilization (CCU) technology is expected to serve as a game-changing solution to halt global warming and achieve a circular economy for carbon by recovering $CO_2$ and utilizing it in products, and we are accelerating the development and spread of various new CCU processes. We have resolved issues in development through joint development with Shimane University Interdisciplinary Faculty of Science and Engineering, leveraging the internal condensation reactor (ICR), a technology that the University has been developing. We aim to complete the demonstration of this technology by 2028, as well as start commercial production using the new process and license the technology to other companies in the 2030s.

**Features of this Technology**

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

Pilot Facility for Methanol Production from $CO_2$

■ Principle of the ICR (Conceptual drawing)



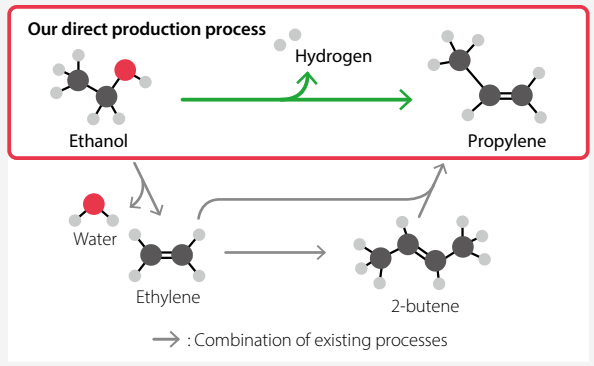

### ⑤ Environmentally Friendly Ethanol-Derived Polyolefin

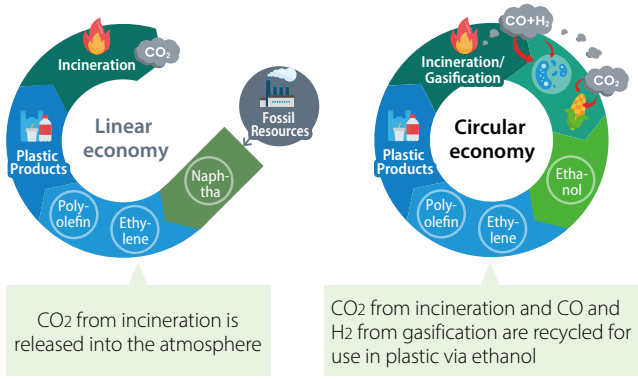
NEDO | GI Fund Projects

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

**Features of this Technology**

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




$CO_2$ from incineration is released into the atmosphere

$CO_2$ from incineration and CO and $H_2$ from gasification are recycled for use in plastic via ethanol

*1 National Research and Development Agency, New Energy and Industrial Technology Development Organization (NEDO)

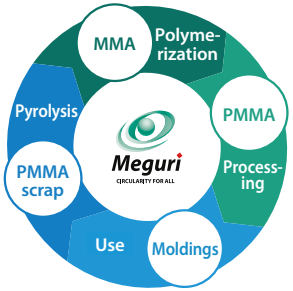
*2 Green Innovation Fund Project

### Chemical Recycling System for Acrylic Resin

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

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

■ Overview of PMMA Chemical Recycling




PMMA Chemical Recycling Pilot Facility

#### An Example of Collaboration

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

Acrylic jewelry made from recycled MMA through chemical recycling

Photographs provided by Star Jewelry Co., Ltd.

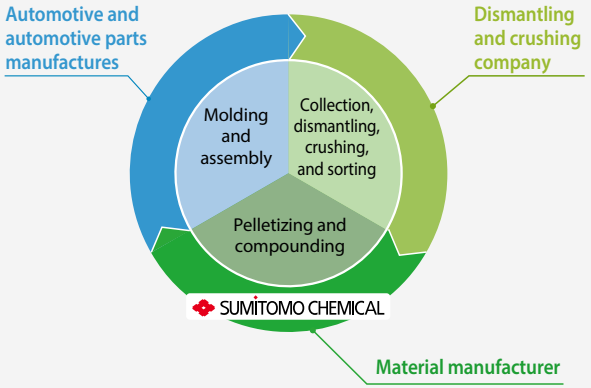
## Mechanical Recycling

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

### PP (Polypropylene) Mechanical Recycling

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

■ Overview of PP Mechanical Recycling




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

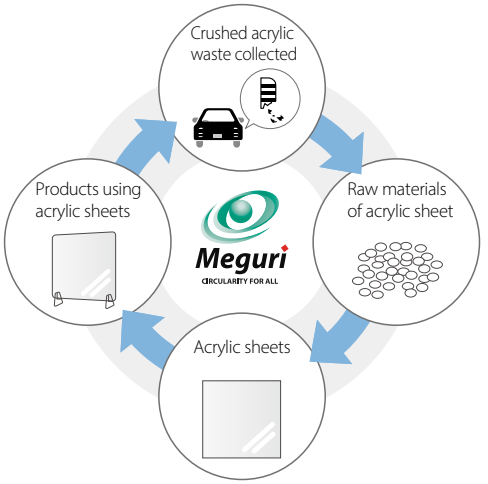
**In addition, we will work towards the acceleration of business development.**

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

### PMMA (Polymethyl Methacrylate) Mechanical Recycling

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

■ Overview of PMMA Mechanical Recycling




#### An Example of Collaboration

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

Lighting sample made using recycled MMA through mechanical recycling

Photograph provided by KOIZUMI LIGHTING TECHNOLOGY CORP.

### Opened Innovation Center MEGURU, a new research facility at our Chiba site

Sumitomo Chemical completed construction of its new research facility Innovation Center MEGURU at its Chiba site in June 2024 and began operations.

The purpose of this research facility is to transform the research area at the Chiba site into an R&D hub for environmental impact reduction technologies and new materials. By consolidating relevant research groups and personnel at the Chiba site and fully utilizing our research resources, we will further accelerate technological development, and this, in turn, will create new value.

Innovation Center MEGURU

Sumitomo Chemical Begins Operations of Newly Established Innovation Center, Consolidates Environmental Impact Reduction Technology Research Groups to Accelerate Creation of New Value

https://www.sumitomo-chem.co.jp/english/news/detail/20240627e.html

### 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.
(Some examples of applicable products.)

**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).

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

https://www.sc-engei.co.jp/company/sustainability/

## Resource Saving and Waste Reduction

### Basic Stance

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 waste sent to landfills. Furthermore, we are setting targets related to the recycling of waste and plastic waste, and are promoting resource recycling initiatives.

### 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.072 Organization of Responsible Care

## Examples of 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)

| | FY2021 | | FY2022 | | FY2023 | |
|---|---|---|---|---|---|---|
| | 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 | 1,713 | 1,429 | 1,684 | 1,421 | 1,451 | 1,196 |
| Metals (excluding minor metals) | 115 | 111 | 104 | 100 | 85 | 81 |
| Minor metals | 17.4 | 0.03 | 16.2 | 0.07 | 15.0 | 0.04 |

Note: Economic effects are detailed in the supplementary data (page 113)

### Promoting the Monetization of Generated Waste and Increasing Recycling Internally and Externally

We have achieved a major reduction in landfill waste by reducing the amount of waste generated and promoting recycling. In addition, as a specified resource identified by the Act on Promotion of Effective Use of Resources, we are also working to reduce the generation of industrial byproducts (sludge).

### 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.

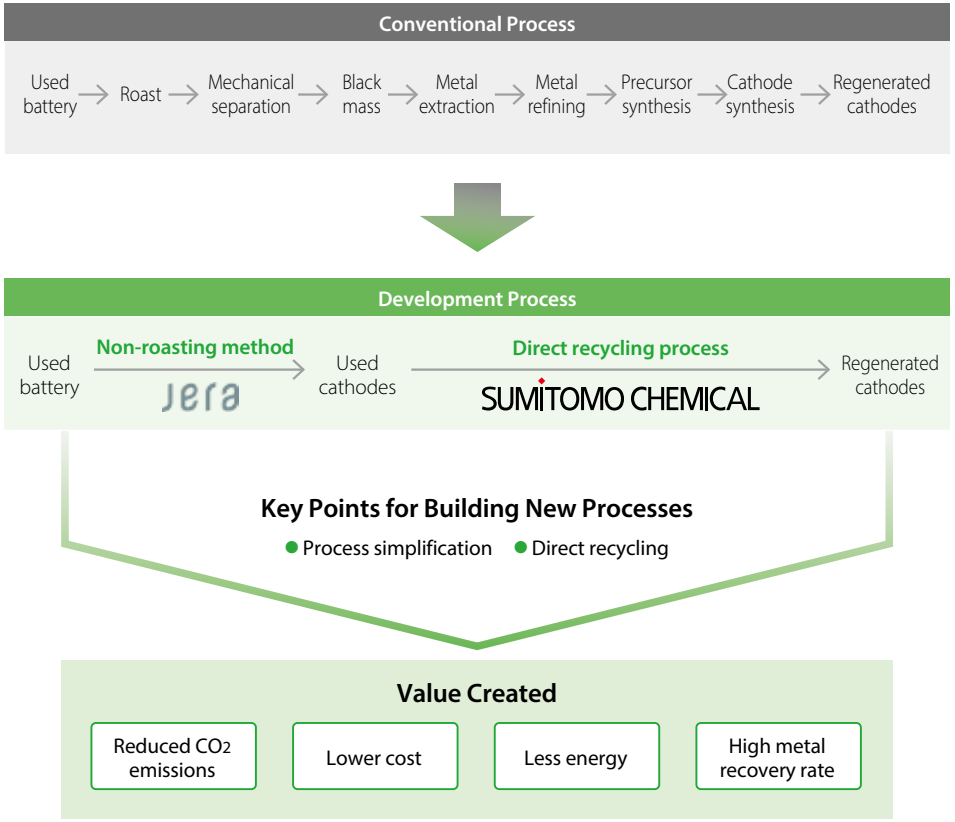
### Direct Recycling Initiatives for Battery Cathode Materials

NEDO | GI Fund Projects

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



# Sustainable Use of Natural Capital

## Basic Stance

Sumitomo Chemical conducts its business using various types of natural capital such as water and soil. Since the early 2000s, we shifted our basic stance in the environmental field to strengthening voluntary management in response to laws and regulations and beefed up our responses to international environmental problems, resource recycling, water risks, soil pollution and other issues. In line with the so-called Nature Positive direction outlined in the Kunming-Montreal Global Biodiversity Framework, which was adopted at COP15, we recognize that biodiversity conservation and sustainable use of natural capital are material issues and we will take further action.

In particular, we are considering and promoting specific actions to realize a Nature Positive stance from the perspectives of both obligation and contribution with the aim of achieving a sustainable future.

## 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.098).

P.098 **Resource Saving and Waste Reduction:** Management System

| Obligation | Contribution |
|---|---|
| ● Works to reduce GHG emissions to near zero<br>● Reduction of chemical substance emissions<br>● Reduction of waste<br>● Effective use of water resources<br>● Promotion of sustainable procurement initiatives, etc. | ● Through products and technologies<br>– Reduction of global GHG emissions<br>–Improvement of soil environment<br>–Improvement of water environment<br>● Nature conservation activities (30by30 initiatives), etc. |

★: 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.081 Environmental Activity Goals and Results: Sustainable Use of Natural Capital

### Environmental Performance

Sumitomo Chemical collects and totals environmental data for the Company's worksites 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).

P.110-111 Environmental Activities: Supplementary Data FY2021–2023 Environmental Performance

## FY2023 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 | 68.7 | 66 |
| Drinking water, etc. | 0.8 | 0.5 |
| Seawater | 606.6 | 162.2 |
| Groundwater | 22.2 | 19.9 |
| Other water | 2.3 | 2.3 |

**Energy ★**
Calculated as kl of crude oil

| | (Thousand kl) | |
|---|---|---|
| Fuel, heat, and electricity*1 | 1,437 | 974 |

**Exhaustible Resources**

| | (Thousand tons) | |
|---|---|---|
| Hydrocarbon compounds | 1,451 | 1,196 |
| Metals (excluding minor metals)*2 | 85 | 81 |
| Minor metals*3 | 15.0 | 0.04 |

### 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 | 24 units | 17 units |
| No. of refrigeration units using HCFCs as a coolant | 214 units | 49 units |

### OUTPUT Product Manufacturing and Environmental Impact

**Products ★**

| | (Thousand tons) | |
|---|---|---|
| (Calculated on the basis of ethylene production)*5 | 1,963 | 1,095 |

**Water Pollutant Emissions ★**

| | | (Tons) | |
|---|---|---|---|
| COD | Coastal waters/waterways | 641 | 594 |
| | Sewer systems | 137 | 66 |
| Phosphorus | Coastal waters/waterways | 24.9 | 23.3 |
| | Sewer systems | 5.0 | 2.9 |
| Nitrogen | Coastal waters/waterways | 1,057 | 1,004 |
| | Sewer systems | 27.2 | 17.9 |
| Substances subject to the PRTR Act | | 13.6 | 12.0 |

**Waste Materials ★**

| | (Thousand tons) | |
|---|---|---|
| Outsourced waste processing*6 | 157 | 49 |
| Landfill*6 | 14.9 | 1.6 |
| (Breakdown) | | |
| On-site landfill | 0 | 0 |
| External landfill | 14.9 | 1.6 |

**Atmospheric Emissions ★**

| | (Thousand tons of $CO_2e$) | |
|---|---|---|
| Greenhouse gases (seven gases)*1 | 4,119 | 2,853 |
| $CO_2$ emissions from energy use | 3,661 | 2,486 |
| $CO_2$ emissions from other than energy use | 382 | 350 |
| $CH_4$ | — | — |
| $N_2O$ | 75 | 16 |
| HFC, PFC $SF_6$, $NF_3$ | 1 | 1 |
| | (Tons) | |
| Others | | |
| NOx | 2,597 | 1,253 |
| SOx | 1,958 | 290 |
| Soot and dust | 127 | 73 |
| Substances subject to the PRTR Act | 635 | 533 |

*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 197 "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 "Outsourced waste processing" and "Landfill" (Sumitomo Chemical and Group companies in Japan) is calculated on a dry-weight basis.

## 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**<br>• Surveying benthic river organisms<br>• Monitoring emitted water and gas, installing autonomous measuring equipment, and combatting odors through activated sludge treatment and activated carbon absorption<br>• Undertaking environmental impact assessments at the planning stage for new plant construction and implementing countermeasures<br>• Promoting the 3Rs and managing waste<br>• Undertaking proper management of chemical substances<br>• Complying with internal safety management regulations pertaining to the use of genetically modified organisms<br>**Promoting "Sumika Sustainable Solutions"**<br>• Developing and promoting products with low environmental burden | **Improving the scenery and upgrading of environments where organisms live**<br>• Conserving reservoirs and using them to promote biodiversity<br>• Promoting the greening of each worksite's premises and neighboring areas<br>• Participation in 30by30<br>• 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.) | **Alliances with stakeholders**<br>• Participating in private partnerships for biodiversity<br>• Incorporating marine plastic waste collection initiatives into management programs based on ISO 14001<br>• Supporting green curtain businesses<br>• Supporting the Osaka plastic zero declaration<br>• Participating in volunteer cleanup activities | **Saving energy, saving resources, and reducing greenhouse gases**<br>• Reducing $CO_2$ emissions (switching fuels, installing gas cogeneration systems, etc.)<br>P.082 Climate Change Mitigation and Adaptation<br>P.095 Contribute to Recycling Resources |
| Relevant SDG targets<br>7.a, 13.3 | Relevant SDG targets<br>6.3, 6.6, 14.1, 15.1, 9.4, 12.2, 12.4, 12.5, 11.6 | Relevant SDG targets<br>13.3, 15.1, 15.2 | Relevant SDG targets<br>11.6, 14.1, 14.2, 15.1, 15.2 |

### 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, raccoon 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 14 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

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 waste incineration, emissions of chemicals and VOCs from manufacturing plants, and airborne asbestos from the demolition of buildings. In addition, we appropriately respond to laws and regulations.

### Targets for Protecting the Atmospheric Environment

- 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 constructed a cogeneration facility fueled by LNG and reined in PM2.5 emission volumes, achieving significant reductions in the emissions of atmospheric pollutants, including NOx and SOx.

* Particulate matter of up to 2.5 μm in diameter

Chiba Works' Highly Efficient Gas Turbine Power Generation Equipment

P.114 Environmental Activities: Supplementary Data: Preventing Pollution: Atmospheric Emissions of SOx, NOx, Soot, and Dust

### 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 a total of 17 units by fiscal 2025 (currently a total of 24 units held by Sumitomo Chemical and Group companies in Japan)
- HCFC equipment: Eliminate use of a total of 49 units by fiscal 2045 (currently a total of 214 units held by Sumitomo Chemical and Group companies in Japan)

**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.

■ Calculated Emissions for Fluorocarbons (Sumitomo Chemical: All Worksites)

(tons-$CO_2$)

| | FY2019 | FY2020 | FY2021 | FY2022 | FY2023 |
|---|---|---|---|---|---|
| Calculated Emissions | 9,354 | 4,362 | 5,100 | 5,844 | 4,051 |

## 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.091 Reduction of GHG Emissions from process (chemical reaction and waste treatment): Innovation in Wastewater Treatment Technology

★: Assured by an independent assurance provider

### 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.

### Water Usage (Sumitomo Chemical Group)

(Million tons)

| | FY2021 | FY2022 | FY2023 |
|---|---|---|---|
| Sumitomo Chemical Group | 970 | 871 | 703 |
| (Breakdown 1) | | | |
| Sumitomo Chemical | 269 | 280 | 251 ★ |
| Group companies in Japan | 693 | 583 | 450 ★ |
| Overseas Group companies | 8.27 | 7.58 | 5.74 |
| (Breakdown 2) | | | |
| Seawater | 862 | 764 | 604 |
| Fresh water | 108 | 107 | 99 |

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.

① 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.

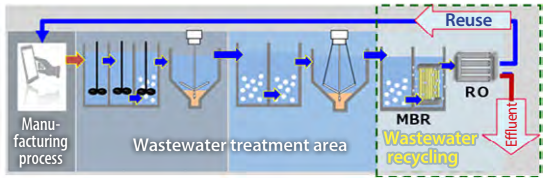
② Evaluating Water Quality Susceptibility Risks

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).

### Initiative to Effectively Utilize Wastewater (Dongwoo Fine-Chem)

Dongwoo Fine-Chem's Pyeongtaek Works recycles wastewater to reduce the amount of industrial water consumed as an initiative to mitigate water risks. The wastewater treatment facility at Pyeongtaek Works recycles treated water into industrial water, using a wastewater recycling system that combines membrane bioreactor (MBR) and reverse osmosis (RO) methods.

### Composition of Wastewater Recycling System (Pyeongtaek Works)



### Initiatives in regions with declining water resources (Sumitomo Chemical India)

| | |
|---|---|
| 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 household wastewater from municipalities, treats it in the factory using earthworm farming technology, and reuses it. This approach reduces the use of river water, which is usually purchased from municipalities, 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

## Conserving Soil Environments

We recognize that the conservation and restoration of soil environments 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 also take 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.

**Reducing Atmospheric Emissions (FY2023 results: atmospheric emissions accounted for around 98% 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, which complies with the Revised PRTR Act enforced from April 2024, Sumitomo Chemical is striving to increase the accuracy and level of detail of the data on emission amounts and transfer amounts for each substance.

## 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.

- **Obtaining certification in the "Conservation Site for Human-Nature Symbiosis" 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 2023 the area acquired certification as a Conservation Site for Human-Nature Symbiosis, which Japan's Ministry of the Environment is promoting as a measure to achieve 30by30 in Japan. We will continue preserving the area as a green area and contributing to the achievement of 30by30.

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. These fungi receive carbon compounds produced by plants through photosynthesis, which increases the amount of carbon compounds in the soil and promotes carbon fixation, thereby reducing atmospheric CO2 and contributing to soil fertility. We are working on the development of technology utilizing mycorrhizal fungi to achieve carbon neutrality and solve food problems.

■ **Benefits of Mycorrhizal Fungi (Including some hypotheses undergoing validation)**