Environment

Contributing to the SDGs through Environmental Activities

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Environmental Activity Goals and Results

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

Items		Boundary	Goals	Fiscal 2019 Results	Evaluation	Page
Addressing Climate Change	Greenhouse gas emissions Scope 1+2*1	Sumitomo Chemical Group Consolidated	Reduce 30% compared to fiscal 2013 levels by fiscal 2030 Reduce more than 57% compared to fiscal 2013 levels by fiscal 2050	Reduced 24% relative to fiscal 2013	○	Pages 99–109
	Scope 3*2	Sumitomo Chemical's major suppliers*3	Reduce overall GHG emissions by fiscal 2024 Conduct engagement to set goals	Held supplier briefings in Tokyo and Osaka	○	
	Unit energy consumption*4	Sumitomo Chemical Group Consolidated	Improve more than 3% over the three years of the Corporate Business Plan (fiscal 2019–2021)	Increased 3% relative to fiscal 2018	△	
	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	Improved by an annual average of 0.5% 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 119–120).

*1 Scope 1: Direct emissions from factory operations, such as fuel use in manufacturing 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 Covers suppliers accounting for 90% of procured raw materials and other items based on weight
*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

Environmental Activity Goals and Results

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

Items		Boundary	Fiscal 2019 Goals	Fiscal 2019 Results	Evaluation	Fiscal 2020 Goals	Page
Environmental Protection	Severe environmental accidents	Sumitomo Chemical and consolidated subsidiaries in Japan and overseas	0	0	○	Severe environmental accidents = 0	Pages 110–118
	Laws and regulations, etc.	Sumitomo Chemical	Properly respond to more stringent laws and regulations and proactively address trends in new environmental regulations	Studied and responded to amendments to the PRTR Act, the Act on Rational Use and Proper Management of Fluorocarbons, and the Air Pollution Control Act (asbestos). Thoroughly discussed legislation to ease or tighten regulations with the Diet.	○	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 and the Soil Contamination Countermeasures Act	○	Provide individual support to Group companies for responding to environmental regulations	
	Prevention of air and water pollution	Sumitomo Chemical	Meet voluntary management criteria*1	There was one instance of the legal standard limit being exceeded and another instance where a limit agreed upon with a municipality was exceeded. We have investigated the causes and taken countermeasures.	△	Meet voluntary management criteria	
	Effective use of water resources	Sumitomo Chemical	Promote effective and efficient use of water resources	Water usage rose by 5.5% relative to fiscal 2018	△	Promote effective and efficient use of water resources	
		Group companies overseas	Improve unit water consumption by at least 1% on average per year	Unit water consumption worsened by 0.5% relative to fiscal 2015		Improve unit water consumption by at least 1% on average per year	
	Response to PRTR	Sumitomo Chemical	Maintain 60% lower total emissions relative to fiscal 2008	Reduced emissions by 89.9% relative to fiscal 2008	○	Maintain 60% lower total emissions relative to fiscal 2008	
		Sumitomo Chemical and Group companies in Japan	Maintain total emissions of air and water pollutants at below fiscal 2015 levels to fiscal 2020	Reduced emissions by 20.2% relative to fiscal 2015		Maintain total emissions of air and water pollutants at below fiscal 2015 levels to fiscal 2020	
	Reduction of VOC emissions	Sumitomo Chemical	Maintain VOC emissions reductions at 30% relative to fiscal 2000	Reduced emissions by 55.0% relative to fiscal 2000	○	Maintain VOC emissions reductions at 30% relative to fiscal 2000	
	Prevention of soil and groundwater contamination	Sumitomo Chemical and Group companies in Japan	Keep hazardous materials strictly within Company premises*2	Continued to keep hazardous materials strictly within Company premises	○	Keep hazardous materials strictly within Company premises	
	Prevention of ozone layer depletion	Sumitomo Chemical and Group companies in Japan	• Eliminate the use of refrigeration units that use CFCs as coolants by fiscal 2025 • Eliminate the use of refrigeration units that use HCFCs as coolants by fiscal 2045	Systematically replaced refrigeration units that use CFCs and HCFCs as coolants	○	• Eliminate the use of refrigeration units that use CFCs as coolants by fiscal 2025 • Eliminate the use of refrigeration units that use HCFCs as coolants by fiscal 2045	
	Conservation of Biodiversity	Sumitomo Chemical	Ensure compliance with "Sumitomo Chemical's Commitment to the Conservation of Biodiversity"	Ensured compliance with "Sumitomo Chemical's Commitment to the Conservation of Biodiversity" and promoted detailed initiatives	○	Ensure compliance with "Sumitomo Chemical's Commitment to the Conservation of Biodiversity"	
	Reduce the amount of industrial waste sent to landfills	Sumitomo Chemical	Maintain 80% reduction compared to fiscal 2000 levels	Reduced by 94.0% relative to fiscal 2000	○	Maintain 80% reduction compared to fiscal 2000 levels	
		Sumitomo Chemical and Group companies in Japan	Maintain waste volume at below fiscal 2015 levels to fiscal 2020	Reduced by 4.3% relative to fiscal 2015	○	Maintain waste volume at below fiscal 2015 levels to fiscal 2020	
	Properly treated PCB waste	Sumitomo Chemical and Group companies in Japan	• (High concentrations of PCB*3) Work toward appropriate storage and recovery of waste containing high concentrations of PCBs and complete PCB waste treatment at an early stage • (Minute amounts of PCB*4) Work toward appropriate storage and recovery of waste containing minute amounts of PCBs and complete PCB waste treatment by March 2025	• (High concentrations of PCB) Sumitomo Chemical: Continuing treatment Group companies in Japan: Continuing treatment; continued to promote the storage and recovery of untreated waste • (Minute amounts of PCB) Implemented the treatment of waste containing minute amounts of PCBs at certain factories; continuing to promote the storage and recovery of untreated waste	○	• (High concentrations of PCB) Work toward appropriate storage and recovery of waste containing high concentrations of PCBs and complete PCB waste treatment at an early stage • (Minute amounts of PCB) 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 121–139).

*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.
*3 High concentrations of PCB: Polychlorinated biphenyl (PCB) intentionally used as insulation oil in such items as electric appliances
*4 Minute amounts of PCB: PCB unintentionally mixed in as insulation oil in such items as electric appliances (over 0.5 mg/kg)

Addressing Climate Change

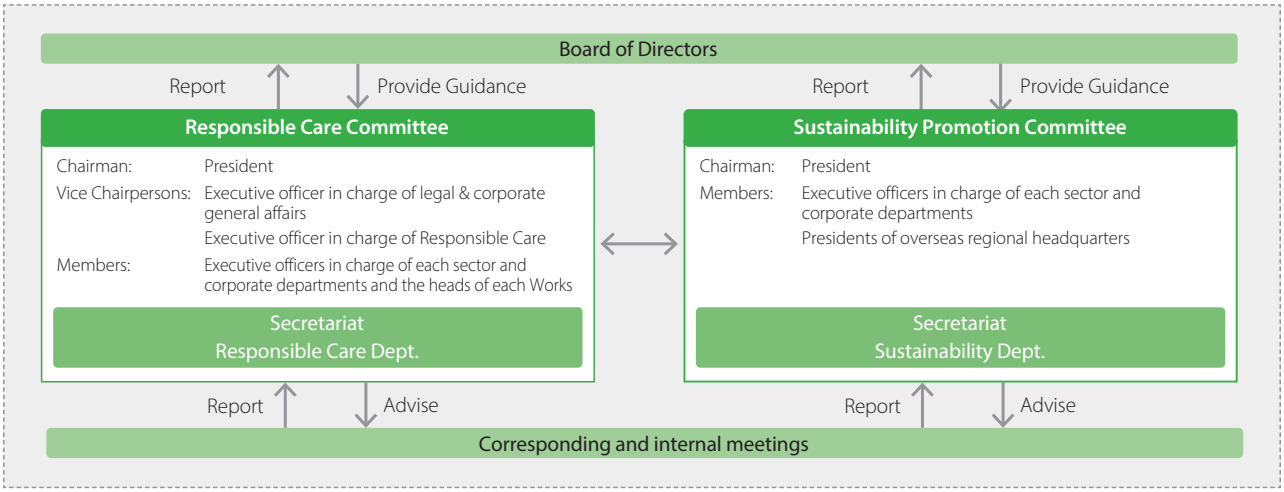
Basic Stance

The Sumitomo Chemical Group considers climate change one of the most pressing challenges facing society. To address this problem, we are actively working to reduce greenhouse gases by utilizing the technology we have cultivated as a diversified chemical company. We are also taking action to respond to risks and to seize opportunities related to solving climate change-related problems that are having a major impact on people's lives on a global scale.

Management System

The president and the executive officer in charge of Responsible Care are both charged with ensuring that the Group is addressing climate change. Key matters are regularly discussed at Sustainability Promotion Committee Meetings (refer to page 80) and Responsible Care Committee Meetings (refer to page 34), which are Company-wide committees where the relevant measures to take are determined. The Responsible Care Committee also assesses and monitors risks related to climate change issues. The content of these meetings is reported to the Board of Directors as appropriate.

■ Organization of Addressing Climate Change



A wide range of specific issues related to energy and greenhouse gases 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 greenhouse gases for Works, research laboratories, business sectors, and Group companies.

Meeting	Coordinator	Members	Content
Company-wide SBTs GM Meeting	Managing executive officer (Responsible Care manager)	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	Managing executive officer (Responsible Care manager)	Managers in charge of climate change action for Group companies	Sharing Group policies and issues and promoting best practices

Addressing Climate Change

★: Assured by an independent assurance provider

Goals and Results

For goals and results for Addressing Climate Change, refer to Environmental Activity Goals and Results.

P.97 Addressing Climate Change

Energy Consumption and Greenhouse Gas Emissions

The Group's greenhouse gas emissions for fiscal 2017 onward are calculated in accordance with the GHG Protocol (refer to page 209 "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.

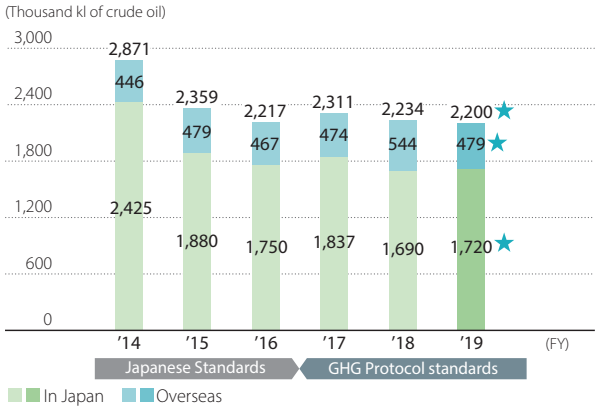
Greenhouse Gas Emissions ★

(Thousand tons of CO_2e)

	Sumitomo Chemical and Group Companies in Japan	Overseas Group Companies	Total
Scope1	5,673	496	6,169
Scope2	288	759	1,048
Total	5,962	1,255	7,217

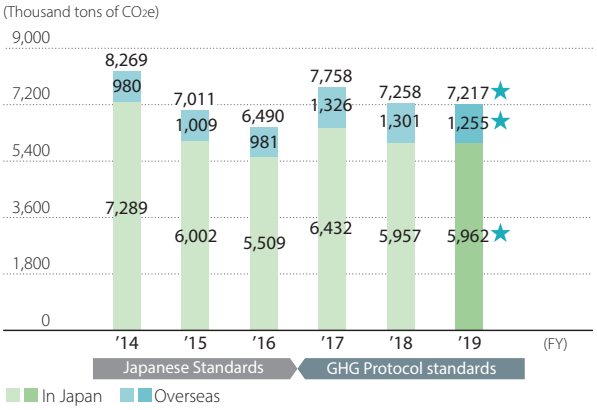
Note: Biomass-derived emissions were 52,000 tons of CO_2e

Energy Consumption



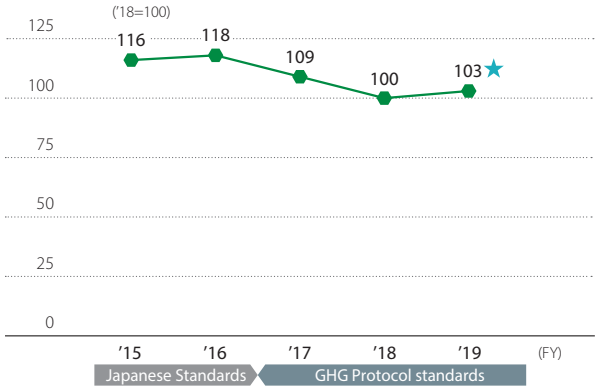
Notes: • Japanese Standards: Calculated based on the Act on the Rational Use of Energy.
• Having adopted the GHG Protocol standards for our GHG emission disclosures, we now include the following data previously excluded from calculations: amount of energy consumed in the production of power and steam sold to external parties by Sumitomo Chemical Group (the portion attributable to energy provider subsidiaries was included in years prior to fiscal 2016). The amount of energy consumed by Sumitomo Chemical's non-production sites and the Group's non-production sites is included from fiscal 2017 and fiscal 2018, respectively.

Greenhouse Gas Emissions



Notes: • Japanese Standards: Calculated based on the Act on the Rational Use of Energy and the Act on Promotion of Global Warming Countermeasures.
• Having adopted the GHG Protocol standards for our GHG emission disclosures, we now include the following data that was not included in previous calculations: CO_2 emissions from energy sold to external parties by the Group (the portion attributable to energy provider subsidiaries was included prior to fiscal 2016); CO_2 emissions from energy use attributable to Sumitomo Chemical's non-production sites; CO_2 emissions from non-energy sources not included in the scope of the Act on Promotion of Global Warming Countermeasures. CO_2 emissions from energy use attributable to Sumitomo Chemical's non-production sites and the Group's non-production sites is included from fiscal 2017 and fiscal 2018, respectively.
• Due to two overseas subsidiaries significantly changing the CO_2 conversion coefficient of their electric power seller from the one used in the previous fiscal year, overseas emissions in fiscal 2019 were around 93,000 t-CO_2e lower than if they had used the same coefficient.

Unit Energy Consumption Index



Notes: • The figures are indexed to energy consumption (GJ) per sales
• The figures are indexed to fiscal 2018 at 100 because we aim to improve at least 3% over the three years of our Corporate Business Plan (FY2019–2021)

Addressing Climate Change

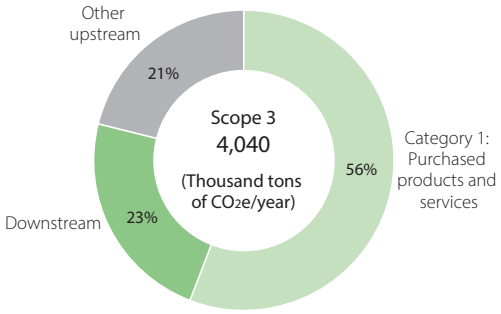
★: Assured by an independent assurance provider

Status of Scope 3 GHG Emissions

(Thousand tons of CO_2e/year)

Category	Emissions		
	FY2017	FY2018	FY2019
1. Purchased goods and services	1,985	2,132	2,276★
2. Capital goods	111	394	151
3. Fuel- and energy-related activities not included in Scopes 1 and 2	290	298	581★
4. Upstream transportation and distribution	57	61	60★
5. Waste generated in operations	28	30	35★
6. Business travel	7	7	10
7. Employee commuting	8	9	11
8. Upstream leased assets	<1	<1	<1
9. Downstream transportation and distribution	<1	<1	<1
10. Processing of sold products	—	—	—
11. Use of sold products	44	44	40★
12. End-of-life treatment of sold products	945	780	879
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 Dainippon 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



Addressing Climate Change

Examples of Initiatives

Strategy: Addressing Risks and Seizing Opportunities

We set up an organization dedicated to addressing climate change in the Responsible Care Department. This organization identifies risks and opportunities that climate change issues present to the Sumitomo Chemical Group over a medium to long term and analyzes their magnitude and the scope of their impact on the Group. As for risks, we are mainly taking measures to achieve our Science Based Targets (SBTs), while as for opportunities, we are primarily focusing on the development and promotion of our Sumika Sustainable Solutions (SSS)-designated products and technologies. The progress of our specific measures is reported in management meetings, meetings of the Sustainability Promotion Committee, the Responsible Care Committee, the Plant Manager's Meeting, and Group President Meeting. In addition, to ensure that each effort continues to progress steadily, we hold various meetings that engage our plants, laboratories, business sectors, and Group companies.

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 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 for achieving our SBTs
  - Revision of the internal carbon price system to enhance energy saving and promote investment in reducing of GHG emissions
  - Switching fuel for power generation (including the establishment of the Niihama LNG Station and the use of renewable energy)
  - Introduction of innovative low-carbon technologies
  - Initiatives for raising awareness and building momentum in the Group
  - Calling on major suppliers to set GHG emission reduction targets
- Strengthening measures against wind and flood damage at production sites

Initiatives for Seizing Opportunities

- Sales expansion for SSS-designated products
  - Products that contribute to reducing GHG emissions
  - Products, components, and materials used for the creation of new energy sources
  - Products that contribute to adapting to the impacts of climate change
- Expansion of revenue from licensing low-carbon process technologies
- Acquisition of investment capital through information disclosure

Addressing Climate Change

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. The Sustainability Promotion Committee currently leads our scenario analysis initiative. We will continue to work on climate change issues by closely monitoring anticipated new changes in the business environment, while also taking a two-front approach of addressing risks and seizing opportunities.

Summary of the Scenario Analysis

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

Scenario	Risks and Opportunities	Anticipated Situation (example)	Impact Assessment
Common for all scenarios*1	Increasing demands for disclosure of information	● Expansion of ESG investment	● Increased opportunity to get access to ESG investment capital by e nhancing information disclosure
		● Increased demands for disclosure of the results of life cycle assessment	● Improved rating in stakeholder assessments with regard to the disclosure of the amount of GHG emissions reduction calculated by life cycle assessment
		● Legalization of disclosure of climate change-related information, and introduction of new environmental accounting standards	● Increased cost of compliance
2°C scenario (reduced GHG emissions)	Increased demand for products and technologies contributing to the mitigation of climate change	● Increasing investment and growing market for products and technologies contributing to the reduction of GHG emissions and for products and technologies related to recycling (Examples) • Growing markets for EVs and fuel cell vehicles (2020 to 2050) • Growing market 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) • Expansion of CCUS*2 (2030 onward) • Expansion of the circular economy, with the aim of reducing CO_2 derived from fossil fuels (2020 to 2050)	● Increased demand for SSS-designated products ● Increasing need for technological development for future SSS-designated products (Examples) • Components and materials for EVs and fuel cell vehicles • Electronic components and materials for more sophisticated IT devices and for energy saving • Products and technologies for CO_2 recovery, on the back of the expansion of CCUS • Recycling related products and technologies
		● Expansion of the switch to low-carbon energy sources	● Increased demand for related products and technologies due to wider use of dispersed power systems and increased demand for semiconductor control devices ● Increased utility costs due to an increased ratio of renewable energy in energy mix
	Introduction of carbon prices	● Higher carbon prices (in developed countries, 100 USD/ton for 2030, 140 USD/ton for 2040)*3	● Increased operation costs due to higher energy taxes including carbon prices (Assuming that the Group's total GHG emissions for fiscal 2040 is 7.2 million tons/year, the same level as for fiscal 2019, and the carbon price is 10 thousand to 14 thousand yen/t-CO_2, the operation costs will increase by 72 to 101 billion yen/year.)
	Increased regulation on GHG emissions	● More reduction of CO_2 emissions and making energy-saving performance mandatory	● Lower utilization of high-energy consumption production facilities
		● Phased abolishment of subsidies for fossil fuels (in India and Southeast Asia)	
		● Accelerating transition to a circular society and increased regulation	
	Increased cost of raw materials	● More use of resources from circular systems and progress in the transition to lower environmental impact processes ● Increased costs due to more use of recycled materials	● More difficult to procure raw materials ● Lower profitability of the existing businesses
4°C scenario (business as usual)	Increased demand for products and technologies contributing to the mitigation of climate change	● Growing market for crops resistant to environmental changes such as temperature rise and drought ● Spread of infectious diseases due to the impact of climate change	● Increased demand for SSS-designated products ● Increased need for technological development for future SSS-designated products (Examples) • Agrochemical products adaptable to the change in crop growth • Biorationals and soil conditioners • Increased demand for agents for prevention and treatment of infectious diseases
	Intensified climate disasters due to temperature rise	● More impact on plant operations	● Facilities located on seashores and river banks cease operations
		● Rising sea level, damage from storm surges and floods, and heat waves	● Decreased cost competitiveness of plants due to increased costs for measures to be prepared for disasters
		● Damage to farmland due to droughts and soil degradation	● Decreased demand due to lower agricultural productivity

*1 Common for all scenarios: Situations that can be expected in both 2°C scenario (reduced GHG emissions) and 4°C scenario (business as usual)
*2 CCUS: Carbon dioxide capture, utilization and storage.
*3 Assumptions based on the "World Energy Outlook (WEO) 450 Scenario" published by the International Energy Agency (IEA), a scenario that is in line with the 2°C target under the Paris Agreement.

Addressing Climate Change

Initiatives Toward Achieving Science Based Targets (SBTs)

Sumitomo Chemical has identified major risks of climate change problems impacting the Group's businesses. These include a cost increase in the event that countries around the world introduce carbon pricing or raise the price for carbon, as well as damage to its production facilities due to intensified climate disasters caused by a rise in temperature. To address these risks, we are taking various group-wide measures to help mitigate climate change. For example, in October 2018, we at the Sumitomo Chemical Group were certified by the Science Based Targets (SBT) initiative for our targets for the reduction of greenhouse gas (GHG) emissions, becoming the first diversified chemical company to receive this certification. Toward the achievement of these targets, we have included the Group's Scope 1+2 GHG emissions in our KPIs. We are also working on various initiatives, such as switching to LNG fuel for our plants, employing the latest highly efficient equipment, and cutting back on energy consumption across the board. In addition, in order to reduce Scope 3 emissions, we have launched an engagement effort with our major suppliers to ask them to set their own reduction targets.

Our Sustainability Promotion Committee and Responsible Care Committee oversee these efforts and their progress.

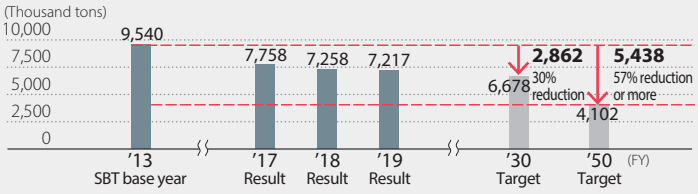
GHG Emission Reduction Targets Certified as SBTs

■ KPI: Amount of Group's GHG emissions (Scope 1+2)

Scope 1 + 2*1

By FY2030	A reduction of 30% (vs. FY2013)
By FY2050	A reduction of 57% or more (vs. FY2013)

GHG emissions and reduction targets

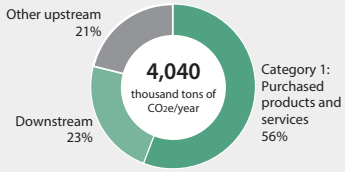


Scope 3*2

By FY2024	Setting GHG emission reduction targets for major suppliers*3

(Reference) Scope 3 GHG emissions (FY2019)

Calculated for Sumitomo Chemical and its listed group companies in Japan.



*1 Scope 1: Direct emissions from our production plants, including the use of fuel in the manufacturing process
Scope 2: Indirect emissions, including the purchase of electricity and heat from outside our production plants

*2 Scope 3: Emissions from the manufacturing and transportation of purchased raw materials
*3 Major suppliers account for 90% of our purchased raw materials by weight

Contributing to Reducing GHG Emissions by Switching Fuel for Thermal Power Generation—Establishment of Niihama LNG Co., Ltd.

In April 2018, Sumitomo Chemical established Niihama LNG Co., Ltd. with Tokyo Gas Engineering Solutions Corporation, Shikoku Electric Power Co., Inc., Sumitomo Joint Electric Power Co., Ltd., and Shikoku Gas Co., Ltd. Niihama LNG's main business is to supply gas to the premises of our Ehime Works, and to a new liquefied natural gas-based thermal power plant, to be built by Sumitomo Joint Electric Power. Construction is in progress, with the start of operations scheduled for February 2022. By partnering with these companies, Sumitomo Chemical will work to promote and expand the use of natural gas, which can contribute to reducing GHG emissions, while also promoting stable and efficient use of energy.

Supplier Engagement—Briefing Session

In November 2019, we held a briefing session for about 30 major suppliers of ours in Japan to present our initiatives toward achieving our SBTs, and to ask our suppliers to set their own GHG emission reduction targets. Going forward, we will organize follow-up meetings and briefing sessions with our suppliers individually, with the aim of having their reduction targets set by fiscal 2024.

Addressing Climate Change

Promoting Sumika Sustainable Solutions

Through the initiative of Sumika Sustainable Solutions, which began in 2016, the Group has been working to develop and promote its products and technologies that help mitigate climate change*1 and facilitate adaptation to climate change.*2 (refer to page 36.)

*1 Reducing and absorbing greenhouse gases
*2 Working to stem or lessen the current effects of climate change as well as harnessing the new climatic conditions

Sumika Sustainable Solutions

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

Measures for Adaptation

Understanding that climate change must be addressed, people are paying more attention to the development of products and technologies that can facilitate adaptation to the changes. Under the banner of Sumika Sustainable Solutions, the Sumitomo Chemical Group has certified many of its products and technologies that promote adaptation. These include vector control products (to ward off infectious disease-carrying pests whose spread correlates with climate change), mycorrhizal fungi for use as a soil amendment product (to extend growing periods during droughts by 30% and improve crop yields), and clear acrylic windows for seawalls that protect against high tides and tsunami.

Of these products, the Company's malaria prevention mosquito net Olyset™ Net was introduced as a tool for helping prevent a rise in malarial infections due to climate change on the side event of COP22, which was held in Morocco in November 2016, and on the side event of COP23, which was held in Germany in November 2017. It was also introduced at Japan's Ministry of the Environment's Climate Change Adaptation Information Platform, Japan's Ministry of Economy, Trade and Industry's Climate Change Adaptation Good Practices by Japanese Private Sector, and other venues.

Japan's Ministry of the Environment's Climate Change Adaptation Information Platform

http://www.adaptation-platform.nies.go.jp/en/index.html

Japan's Ministry of Economy, Trade and Industry's Climate Change Adaptation Good Practices by Japanese Private Sector

http://www.adaptation-platform.nies.go.jp/en/lets/adaptationbiz/sumitomokagaku.html

Addressing Climate Change

Initiatives Aimed at Reducing Greenhouse Gas Emissions at Each Worksite

Each Sumitomo Chemical worksite helps reduce greenhouse gas 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 where finding ways to save energy is difficult and requires a high level of expertise, we have launched initiatives in cooperation with experts. Information on the state of these activities is exchanged at Energy Manager Meetings, at which representatives from each worksite gather in one location to work on reducing the greenhouse gas emissions of the Company as a whole.

Osaka Works: Shifting to LED

The Osaka Works is working to conserve energy by actively installing more LEDs. In the Eco-First Commitments (refer to page 83), promoting the installation of LED lighting at worksites is given as an example of a way to reduce greenhouse gas emissions (CO_2) through energy conservation, and this effort will contribute to that end goal.

By fiscal 2019, the Osaka Works had upgraded around 78%, or 14,400, lights to LEDs. This is the highest rate among all the worksites, which average 48%. Due to the complex nature of the worksite, it is difficult for the Osaka Works to carry out unified energy conservation initiatives. However, the Works will continue shifting to LED lighting going forward as a major initiative with far-reaching effects on both the Works and research.

Example of LEDs at the Works: Upgrading the lighting of the gym at the Works

Electrolysis Plant: Achieving Benchmarks* (FY2018, FY2019)

The electrolysis plant electrically breaks down saltwater into chlorine, hydrogen, and caustic soda. The Act on Rational Use of Energy prescribes an industrial top runner program (benchmark program).

The production efficiency of the plant is better with the higher the temperature of the electrolysis tank, and the raw material salt water is heated using steam before being fed into the tank. To make operations more energy-efficient, we monitor production efficiency and the amount of energy used to heat salt water to determine the optimal operating conditions. We have changed to a control method that further enhances the collection of excess heat, maintains the minimum necessary temperature for the electrolysis tank, and uses steam only for the minimum amount of heating needed. Thanks to our persistence, we have achieved our benchmarks for two consecutive years (fiscal 2018 and 2019).

* A benchmark is an energy conservation standard that operators in specific industries and fields should achieve over the medium to long term. This makes it clear whether one company's energy conservation level is greater or less than that of its competitors. Those with a greater level receive more favorable ratings, and those lagging behind are encouraged to ramp up their efforts. The level achieved by only 10% to 20% of operators overall in each industry is set as the standard that operators should aim for (the target level in soda operations is 3.22 GJ/T or less).

Addressing Climate Change

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Responsible Care Department, Ehime Works Methionine Plant and Electrolysis Plant Acquiring Certification for the Energy Management System (ISO 50001: 2018)

On February 10, 2020, Sumitomo Chemical's Responsible Care Department and the Ehime Works methionine plant and electrolysis plant acquired certification for their energy management systems (ISO 50001: 2018). The registration certificate was awarded on February 17, 2020.

With the fiscal 2013 level as the index, the Company is aiming to reduce its organizational greenhouse gas (GHG) emissions 30% by fiscal 2030 and at least 57% by fiscal 2050. These targets were announced internally and externally and their certification as Science Based Targets (SBTs) was acquired in October 2018.

At the two plants at the Ehime Works, a significant consumer of energy, and relevant departments of the Head Office, we constructed energy management systems, began operating them, and eventually acquired certification for them. This was done as the first step in promoting PDCA cycles for specific reduction processes as an organization. Going forward, our policy is to actively promote these management systems as a tool to achieve our SBTs.

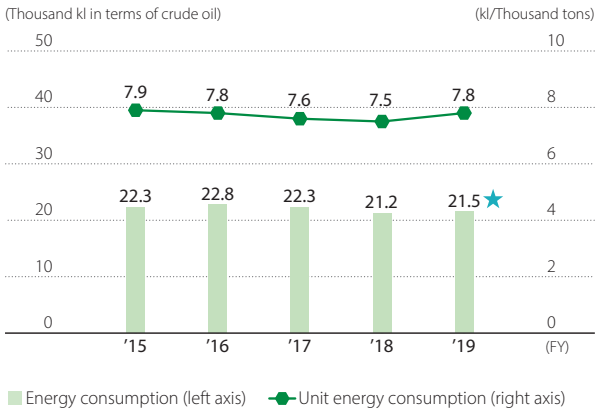
Left: Mr. Kazuo Tatsukami, President of Audit and Certification Organization JACO
Right: Yoshihiro Miyoshi, Managing Executive Officer of Sumitomo Chemical Co., Ltd.

Logistics Initiatives

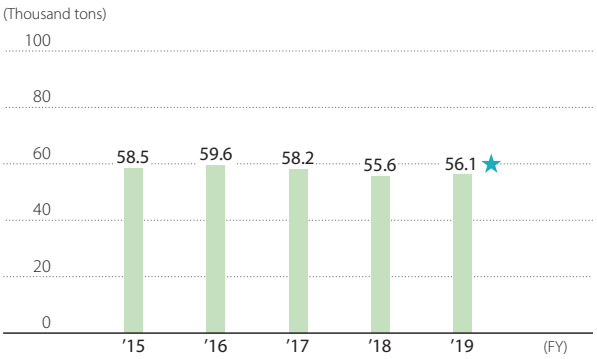
Sumitomo Chemical continues to promote modal shift, or transportation by more efficient and environmentally friendly modes, such as rail and ship instead of trucks. In fiscal 2019, energy consumption (crude oil equivalent) increased compared with fiscal 2018 due to the rise in long-distance shipping by chemical tankers in response to the scheduled maintenance and repair of Works despite there being no significant change in the volume of cargo transported. As a result, unit energy consumption rose 3.6%, for an average 0.5% improvement 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 Group companies 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.)

Addressing Climate Change

The BioCarbon Fund*

Sumitomo Chemical finances afforestation projects in developing countries and poverty-stricken countries through the World Bank's BioCarbon Fund. These projects are geared to contribute to the restoration of abandoned land, the conservation of water resources, biodiversity conservation, and the reduction of greenhouse gases. Since participating for the first time in 2005, Sumitomo Chemical has been involved in multiple afforestation projects, which have led to a combined total of 229 thousand tons in reductions in CO_2 emissions.

* BioCarbon Fund:
This fund was established by the World Bank to finance projects to plant trees and preserve forests with the objective of acquiring CO_2 credits (emissions rights issued based on the volume of CO_2 reduced or absorbed as a result of projects designed to reduce greenhouse gases).

R&D Initiatives for Addressing Climate Change

One of the basic policies established by Sumitomo Chemical under the Corporate Business Plan (FY2019–2021) is accelerating the development of next-generation businesses. One priority area of that policy is reducing environmental impact. Sumitomo Chemical has identified energy storage, energy conservation, and carbon recycling as areas of strength that are indispensable to helping solve climate change problems and for which the Company can use the technologies it has cultivated to date.

In the field of energy storage, we are developing next-generation batteries and fully solid state battery materials that help reduce greenhouse gas emissions. In the field of energy conservation, we strive to develop water treatment processes with low environmental impact and CO_2 separation membranes to enhance energy efficiency. In the field of carbon recycling, we are currently working to develop bioprocesses that use synthetic biology and chemical production processes that use carbon capture and utilization (CCU).

As an initiative to ensure next-generation energy, we are conducting a survey related to CO_2-free hydrogen manufacturing technologies that do not emit CO_2 during the manufacturing stage and their effective implementation.

In these fields, we are promoting research and development while actively installing external technologies in collaboration with academia and startup companies.

Moreover, Sumitomo Chemical newly established a Research and Development (R&D) Group, named "Technological Development Group of Environmental Initiatives" in the Petrochemicals Research Laboratory (Sodegaura City, Chiba) on April 1, 2020. The new R&D group's mission is to develop a process to reduce environmental impact by making the best use of core technologies, including catalyst design and chemical processing design, which the company has cultivated in the Petrochemical & Plastic business. By concentrating research projects currently dispersed across several research laboratories into the Petrochemicals Research Laboratory and by beefing up the number of researchers to about 30, Sumitomo Chemical will accelerate its development exponentially while also focusing on new projects. In addition, the new R&D group will actively collaborate with academia and companies that have advanced technologies, and promote activities to make environmental impact reduction technology into a new business in the Petrochemicals & Plastics Sector.

Sumitomo Chemical has identified environmental impact mitigation as one of the material issues to be addressed by its management. The company will continue to create solutions for social issues, such as carbon cycling technology and greenhouse gas emission reduction technology.

■ Examples of development projects at the new R&D group

- Polyolefin manufacturing technology using waste-derived ethanol as a raw material
- Chemical recycling technology for waste plastics
- Chemicals manufacturing technology using CO_2
- Innovative energy-saving technology for chemical manufacturing processes
- Development of energy-saving wastewater processing systems

Addressing Climate Change

External Evaluations

Sumitomo Chemical was selected for the A List, the highest evaluation, in the CDP's climate change action survey for the second consecutive year. (January 2020)

https://www.sumitomo-chem.co.jp/english/news/detail/20200120e.html

Sumitomo Chemical was ranked first among 37 chemical companies in Japan in the 10th Corporate Climate Action Survey by the World Wide Fund for Nature Japan (WWF Japan), under the materials industry section. (May 2019) (Japanese only)

https://www.wwf.or.jp/activities/activity/3967.html

The Japan Chemical Industry Association awarded the Sumitomo Chemical Group the Examiner's Special Award at the 13th JCIA Responsible Care Awards (Japanese only) for the Group's initiatives aimed at realizing a low-carbon society (June 2019) and the Excellence Award at the 14th JCIA Responsible Care Awards (Japanese only) for the Group's initiatives to promote sustainability, with the Misawa Works RC activities used as a case study (May 2020).

Looking Ahead

The Sumitomo Chemical Group will continue actively working to solve climate change problems using the technological capabilities it has cultivated as a diversified chemical company.

Environmental Protection

Basic Stance

The Sumitomo Chemical Group is working in unison to reduce its environmental impact. Specifically, we have set out goals in each field, including protecting the atmosphere and aquatic environments, conserving resources and managing waste, properly managing chemical substances, protecting biodiversity, and protecting soil environments. Each worksite and Group company is striving to enhance its initiatives aimed at achieving these goals.

Over the course of the three years of the current Corporate Business Plan (FY2019–2021) we aim to continue strengthening and enhancing our initiatives based on voluntary control and further enhance the level of activity undertaken by the consolidated Group. We also strive to more accurately and quickly disclose environmental performance indicators.

We are focusing on the following specific measures.

1. Appropriate Response to Laws and Regulations
   (1) By maintaining careful control of the execution and management of construction plans, we ensure appropriate response to notifications when changing the soil type of specified facilities that use hazardous substances and an expansion of opportunities for soil contamination surveys. (Soil Contamination Countermeasures Act)
   (2) We have enhanced the evaluation and management of environmental risks related to specified chemical substances expected to be selected under the PRTR Act. (PRTR Act)
   (3) 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 minimizing fluorocarbon leaks into the atmosphere from refrigeration and air conditioning equipment. (Act for Rationalized Use and Proper Management of Fluorocarbons)
   (4) We will systematically remove all electronic equipment that uses PCBs (in storage or in operation) by March 2025. (Act on Special Measures against PCB Waste)

2. Reducing Environmental Impact
   Going forward, we will keep working to achieve our medium- to long-term voluntary management targets in the fields of air, water, soil, and waste, focusing our response on production bases.

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) 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. The department also establishes targets (details of the amendments, possible impacts, visualization of countermeasures, etc.) that all people addressing the problems can work towards and commits 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.80 Organization of Responsible Care

Environmental Protection

★: Assured by an independent assurance provider

Goals and Results

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

P.98 Environmental Protection

Environmental Performance

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

PP.121–123 FY2017–2019 Environmental Performance

■ FY2019 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	63.4	60.4
Drinking water, etc.	0.8	0.5
Seawater	918.2	180.9
Groundwater	21.8	19.1
Other water	2.2	2.2

Energy ★
Calculated as kl of crude oil

		(Thousand kl)
Fuel, heat, and electricity*1	1,720	1,054

Exhaustible Resources

		(Thousand tons)
Hydrocarbon compounds	1,829	1,545
Metals (excluding minor metals)*2	109	105
Minor metals*3	11.20	0.02

PCB/CFCs under Secure Storage

No. of electrical devices containing high concentrations of PCBs*4	13 units	4 units
PCB volume*4	0 kl	0 kl
No. of refrigeration units using specified CFCs as a coolant	32 units	11 units
No. of refrigeration units using HCFCs as a coolant	260 units	110 units

OUTPUT Product Manufacturing and Environmental Impact

Products ★

		(Thousand tons)
(Calculated on the basis of ethylene production)*5	2,521	1,411

Water Pollutant Emissions ★

			(Tons)
COD	Coastal waters/waterways	887	816
	Sewer systems	197	112
Phosphorus	Coastal waters/waterways	30.5	28.1
	Sewer systems	4.7	4.2
Nitrogen	Coastal waters/waterways	1,457	1,377
	Sewer systems	53.3	36.5
Substances subject to the PRTR Act		8.0	6.4

Waste Materials ★

		(Thousand tons)
Waste emissions*6	232	50
Landfill*6	22.0	1.5
(Breakdown)		
On-site landfill	0	0
External landfill	22.0	1.5

Atmospheric Emissions ★

		(Thousand tons of CO_2e)
Greenhouse gases (seven gases)*1	5,962	3,544
Emissions from energy use (CO_2)	5,209	2,903
CO_2 emissions from other than energy use	659	622
N_2O	89	15
HFC	4	4
CH_4, PFC, SF_6, NF_3 *7	—	—

		(Tons)
Others		
NOx	4,208	1,754
SOx	4,621	1,490
Soot and dust	192	101
Substances subject to the PRTR Act	438	240

*1 The energy (calculated as kl of crude oil) and greenhouse gas (all seven gases) indices were calculated in accordance with the GHG Protocol (refer to page 209 "Calculation Standards for Environmental and Social Data Indicators") for principal consolidated Group companies in Japan, which account for up to 99.8% of consolidated net sales.
• Having adopted the GHG Protocol standards for our GHG emission disclosures, we now include the following data that was not included in previous calculations: amount of energy used to produce electricity and steam sold to external parties by the Group and the resultant CO_2 emissions; amount of energy used by Sumitomo Chemical and Group companies in Japan non-production sites and the resultant CO_2 emissions; CO_2 emissions from non-energy sources not included in the scope of the Act on Promotion of Global Warming Countermeasures.
*2 Calculations include the following 12 metals: iron, gold, silver, copper, zinc, aluminum, lead, platinum, titanium, palladium, gallium, and lithium.
*3 Calculations include the following seven minor metals: nickel, chromium, tungsten, cobalt, molybdenum, manganese, and vanadium. The supply structure for each of these minor metals is extremely fragile. These minor metals are subject to national stockpiling.
*4 Fluorescent lamps and mercury lamp ballast as well as contaminated substances (wastepaper, etc.), including PCB waste, are not included in unit and volume data.
*5 Certain assumptions were made in calculations due to the difficulty of obtaining weight-based figures for some products.
*6 The amount of coal ash generated at Sumitomo Joint Electric Power, which is included in "Waste emissions" and "Landfill" (Sumitomo Chemical and Group companies in Japan) is calculated on a dry-weight basis.
*7 In reference to the Act on Promotion of Global Warming Countermeasures, companies that emit less than 3,000 tons of CO_2-equivalent per year for each type of greenhouse gas are outside the scope of calculation.

Environmental Protection

Examples of Initiatives

Protecting the Atmospheric Environment

By strengthening our measures for fixed emission sources, we are working on reducing our various environmental impacts, including emissions of soot and dust from boilers, leaks of fluorocarbons from refrigeration equipment, emissions of mercury from industrial waste incinerators, emissions of chemicals and VOCs from manufacturing plants, and airborne asbestos from the demolition of buildings.

1. Reining in PM2.5* Emissions

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

* Particulate matter of up to 2.5 μm in diameter

2. Managing Fluorocarbon Refrigeration Equipment

As part of efforts to protect the ozone layer and combat global warming, we are systematically upgrading fluorocarbon refrigeration equipment (units that use CFCs, HCFCs, HFCs) employed in production processes to equipment that uses HFCs with a low global warming potential (GWP) or non-fluorocarbon refrigerants. Our goal is to complete these upgrades within the upgrade deadlines for the equipment.

Upgrade Deadlines for Each Type of Equipment

- CFC equipment: Eliminate use of these units by fiscal 2025 (currently a total of 32 units held by the Group)
- HCFC equipment: Eliminate use of these units by fiscal 2045 (currently a total of 260 units held by the Group)

We aim to dutifully adhere to this plan, which, in line with the Act for Rationalized Use and Proper Management of Fluorocarbons, includes regularly examining the fluorocarbons used in industrial refrigeration and air conditioning equipment, devising ways of minimizing leaks identified in equipment designated as needing attention based on leakage history categorized by equipment type, as well as taking thorough, swift action once problems related to equipment installation are uncovered.

3. 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.

Environmental Protection

★: Assured by an independent assurance provider

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.

1. 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 some Works, for process wastewater that is difficult to break down 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.

2. 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 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 systems have been implemented to regulate the total water emissions of COD, nitrogen, and phosphorus.

3. Promoting the Effective Use of Water

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)

	FY2017	FY2018	FY2019
Sumitomo Chemical Group	1,033	944	1,014
(Breakdown 1)			
Sumitomo Chemical	267	249	263★
Group companies in Japan	759	688	743★
Overseas Group companies	7.19	7.34	7.40
(Breakdown 2)			
Seawater	930	848	918
Fresh water	103	96.0	95.4

Note: Water usage volume includes seawater

Environmental Protection

Evaluating Water-Related Problems

The Sumitomo Chemical Group is evaluating water-related risks at each production base from the perspective of water supply and demand risks and water pollution susceptibility risks.

Evaluating Water Supply and Demand Risks

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

Evaluating Water Pollution Susceptibility Risks

The Group evaluates water supply and demand and its fragility 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).

As a result of the evaluation results, we are taking specific actions to reduce risks going forward for plants evaluated to have high water-related risks.

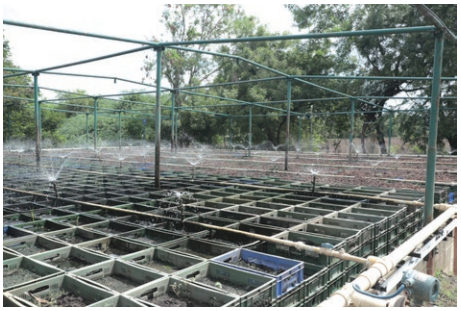
Measures to Continue Production in High Water-Related Risk Areas

The Sumitomo Chemical Group conducts business activities in many places around the world, and some of its Group companies engage in production activities in countries and regions designated as having a high baseline with regard to water stress (physical risk) according to the Aqueduct Water Risk Atlas. Sumitomo Chemical India's Bhavnagar plant is one example.

To secure water for its production operation needs, the Bhavnagar plant purchases river water from the local municipality. Recently, however, there has been an increase in the surrounding population and demand for water for farms. This, coupled with a decrease in annual rainfall, has made it difficult for the plant to secure the water needed for production operations.

The Bhavnagar plant then decided to purchase a portion of the household wastewater that the surrounding municipalities are responsible for treating, and treating the wastewater itself to use in its production operations. First, the plant laid down two kilometers of pipe to transport the household wastewater to the plant. A unique aspect of this plan is that to treat the wastewater, the plant does not use the general activated sludge method but rather uses the pollutants contained in the wastewater as nutrients to farm worms (vermiculture).

Through this initiative, the plant was able to reduce its purchasing of river water by more than 70% while solving the plant's long-standing issue of securing a stable water supply for production activities. As an added bonus, its water purchase costs were cut to around half.



Wastewater being purified through earthworm farming

Environmental Protection

Resource Saving and Waste Reduction

We are systematically working to reduce the amount of exhaustible raw materials used, quickly and properly dispose of PCB waste, and reduce the amount of industrial waste sent to landfills.

1. 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)

	FY2017		FY2018		FY2019	
	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	1,835	1,593	1,676	1,383	1,829	1,545
Metals (excluding minor metals)	120	115	121	117	109	105
Minor metals	10.17	0.02	13.54	0.07	11.20	0.02

Note: Economic effects are detailed in the supplementary data (page 125)

2. Thoroughly Managing Waste and Promoting Increased Recycling Internally and Externally

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

3. 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 main Group companies 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.

Environmental Protection

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 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

Considering the environment in business activities

- Surveying benthic river organisms
- Monitoring emitted water and gas, installing autonomous measuring equipment, and combatting odors through activated sludge treatment and activated carbon absorption
- Undertaking environmental impact assessments at the planning stage for new plant construction and implementing countermeasures
- Promoting the 3Rs and managing waste
- Undertaking proper management of chemical substances
- Complying with internal safety management regulations pertaining to the use of genetically modified organisms

Promoting "Sumika Sustainable Solutions"

- Developing and promoting products with low environmental burden

7. a | 13.3

2. Encouraging conservation of habitable environments

Improving habitable environments and creating scenic views

- Conserving reservoirs and using them to promote biodiversity
- Promoting the greening of each worksite's premises and neighboring areas
- Collaborating on an afforestation project in Thailand
- Taking countermeasures for white smoke (To render invisible the gas emitted after incineration to reduce, recycle, and detoxify waste and wastewater onsite (white smoke), we have installed cooling equipment to condense the vapor.)

6.3 6.6 | 14.1 | 15.1 | 9.4 | 12.2 12.4 12.5 | 11.6

3. Mainstreaming initiatives and alliances with stakeholders

Alliances with stakeholders

- Participating in private partnerships for biodiversity
- Incorporating marine plastic waste collection initiatives into management programs based on ISO 14001
- Supporting green curtain businesses
- Supporting the Osaka plastic zero declaration
- Participating in volunteer cleanup activities

13.3 | 15.1 15.2

4. Preventing climate change and effectively using resources

Saving energy, saving resources, and reducing greenhouse gases

- Conducting energy-saving activities based on ISO 50001
- Reducing CO_2 emissions (switching fuels, installing gas cogeneration systems, etc.)

11.6 | 14.1 14.2 | 15.1 15.2

Environmental Protection

Misawa Works Initiatives

<River Benthic Organism Surveys Done when Conducting Water Area Surveys>

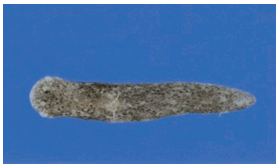
With the purpose of confirming the impact of business activities on water areas, we conduct aquatic wildlife surveys of the Sabishiro River, into which process water from the Works flows. As a result, we confirmed a vulnerable species of *Stenothyra* in the Sabishiro River. In addition, we discovered 10 species of precious aquatic benthic organisms, such as the endangered species *Cottus reinii*. By being able to confirm organisms through this survey, we determined that we were maintaining ecosystems with extremely good water quality. Going forward, we will continue to regularly conduct surveys of water areas and confirm that we are conserving the environment.

Stenothyra

Cottus reinii

Dugesia japonica

A subspecies of *Tubifex tubifex*


American *Dugesia japonica*

Eogammarus kygi

Asellota

Gnorimosphaeroma

<Wastewater Detoxification Initiatives>

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. In addition, we monitor the fish in the outflow.

Activated sludge treatment facility

Fish monitor

<Sabishiro Cleanup Volunteering>

As part of our measures to reduce plastic waste in the ocean, we engage in garbage collection activities along the Sabishiro shoreline. From 2020 onward, we will work to incorporate these activities into our management programs based on ISO 14001. Since fiscal 2020, we have been certified as an Aomori Prefecture Hometown Aquatic Supporter.

Aquatic Supporter Certificate

A Sabishiro shoreline cleanup volunteer

Sumitomo Chemical's Greening Activities

<Initiatives at Works in Japan>

At the Gifu Plant, so as not to infringe upon the scenery of the surrounding areas, we are promoting the greening and beautification of the plant's premises and borders. At the Oita Works, as part of greening efforts, we planted Asiatic jasmine along about 250 meters of the wall north of the front gate.

The area surrounding the Gifu Plant's fish pond

Oita Works' green belt

<Afforestation Volunteer Activities in Thailand>

From 2008 to 2019, we planted a total of 828,000 saplings in the Sumitomo Chemical Forest, a mangrove afforestation project in southern Thailand. In addition, a running total of 179 employees participated in the project and interacted with the area's residents, for example, by visiting local elementary schools.

P.192 Matching Gift Program

Afforestation efforts underway

Group photo of the volunteers

Environmental Protection

Appropriate Management of Chemical Substances

Regarding class 1 specified chemical substances (PRTR Act) and VOCs, we conduct environmental risk analyses regardless of the amount emitted into the environment. We are also taking measures to reduce use and emissions.

Examples of Initiatives

1. 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.

2. Reducing Atmospheric Emissions (FY2019 results: atmospheric emissions accounted for around 98% of total emissions (air and water))

   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.

3. Operating Company-wide PRTR Calculation Systems

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

Protecting the Soil Environment

We quantify the soil environments of worksites, strictly prevent the diffusion of pollutants, and actively work to prevent contamination.

Examples of Initiatives

1. 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.

2. 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.

Looking Ahead

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

From the perspective of continued risk management, we will focus our efforts on issues that are assessed as being high risk over the medium to long term and take appropriate action that enhances voluntary management.