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).

Resource Saving and Waste Reduction: Management System

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

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.

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).

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

● **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

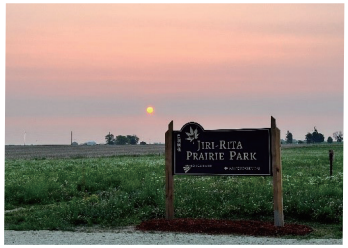
Double cherry

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

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)

■ 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

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.

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.

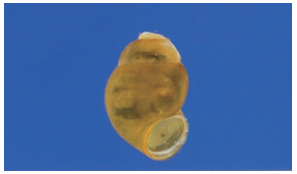
At Works, for process wastewater that is difficult to break down, which was conventionally incinerated for treatment, we have developed an activated sludge treatment utilizing microbial immobilization technology to stabilize the process water and reduce treatment costs. We are still considering applying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

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

Water Area Surveys Conducted around Works (Misawa Works)

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

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



Stenothyra

Cottus reinii

Dugesia japonica

A subspecies of *Tubifex tubifex*

Responding to Water Quality Standards

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

Promoting the Effective Use of Water

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

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.

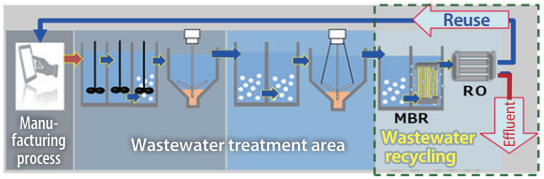
② Evaluating Water Quality Susceptibility Risks

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)**