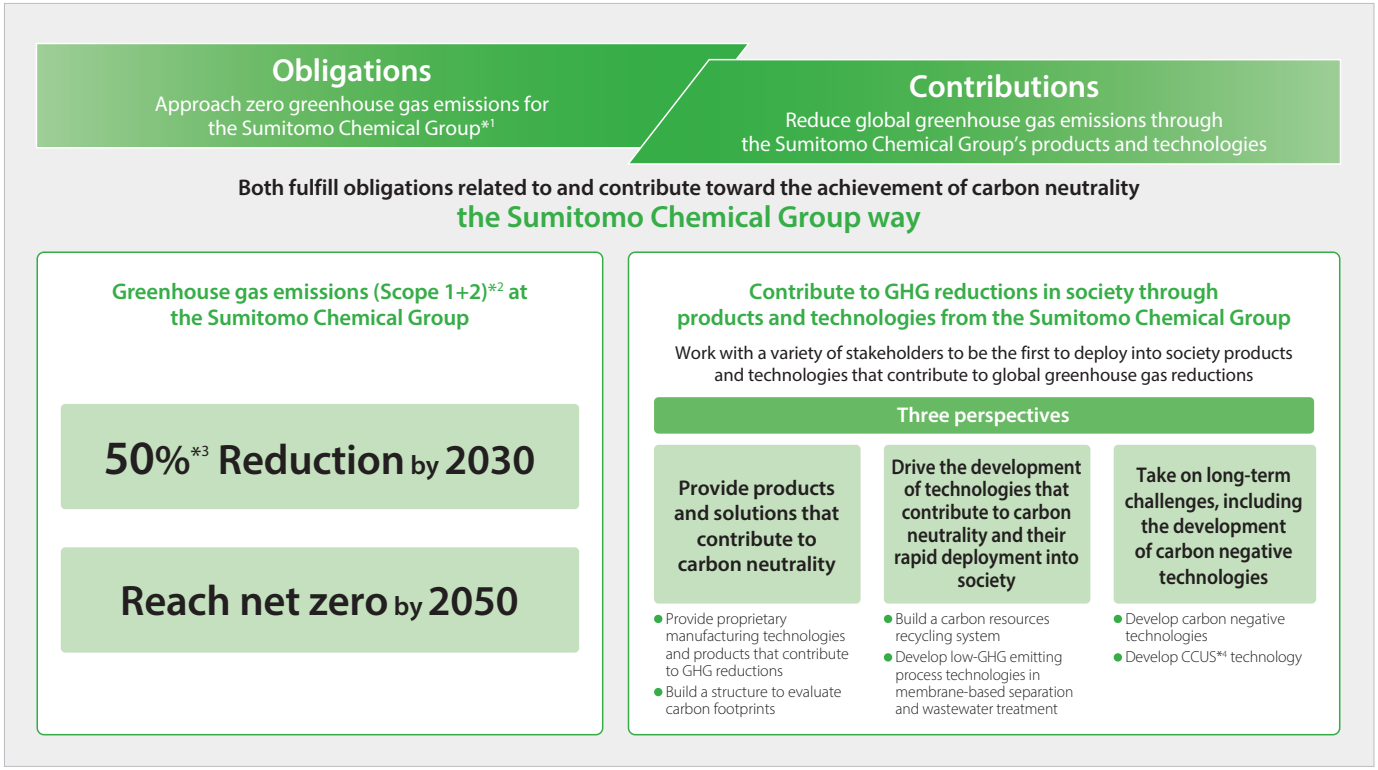
Climate Change Mitigation and Adaptation

Basic Stance

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

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

■ Grand Design toward Achieving Carbon Neutrality



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

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

*3 Compared to FY2013

*4 CCUS: Carbon dioxide Capture, Utilization and Storage

Disclosure in Line with TCFD Recommendations

Sumitomo Chemical expressed its support for the TCFD recommendations when they were published in June 2017. In line with the four recommended disclosure items, "Governance," "Risk Management," "Strategy," and "Metrics and Targets," the Group's efforts to address climate change issues are introduced on pages 83-94.

Governance

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

Management Meetings:
Deliberation of important matters such as management strategies and capital investments, including agenda items and report items related to climate change response

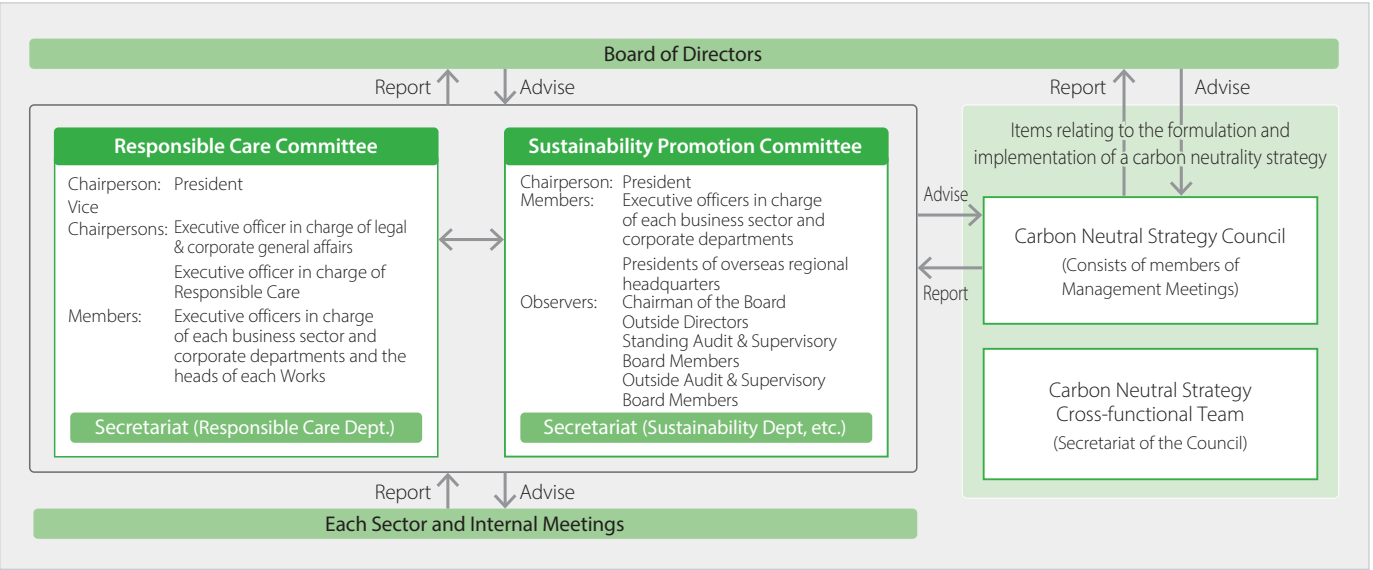
Sustainability Promotion Committee:
Deliberations on important matters related to sustainability promotion

Responsible Care Committee:
Formulation of annual policies, mid-term plans, and specific measures to address climate change, as well as analysis and evaluation of performance

Carbon Neutral Strategy Council:
Deliberation and promotion of the grand design for achieving carbon neutrality by 2050

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

Structures for Responding to Climate Change



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

Risk Management

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

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

Specific Procedures

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

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

Risk Management

■ Risks and Opportunities

Risks

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

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

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

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

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

Strategy

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

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

Investments to Achieve Carbon Neutrality

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

Investment Scale

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

Scenario Analysis

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

Summary of the Scenario Analysis

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

Scenario	Risks and Opportunities	Anticipated Situation (Example)	Impact Assessment	Action
Common for All Scenarios*1	**Increasing Demands for Disclosure of Information**	● Expansion of ESG investment ● Increased demands for disclosure of the results of life cycle assessment ● Legalization of disclosure of climate change-related information, and introduction of new environmental accounting standards	● Increased opportunity to get access to ESG investment capital by enhancing information disclosure ● Improved rating in stakeholder assessments with regard to the disclosure of the amount of GHG emissions reduction calculated by life cycle assessment ● Increased cost of compliance	● Formulate and release our Grand Design for achieving carbon neutrality ● Disclose the amount of avoided GHG emissions (Science-Based Contributions) ● Develop a carbon footprint calculation tool (CFP TOMO®) and provide it to other companies for free ● Respond to trends in regulations and movements by related institutions
1.5°C Scenario (Reduced GHG Emissions)	**Increased Demand for Products and Technologies Contributing to the Mitigation of Climate Change**	● Increasing investment and growing market for products and technologies contributing to the reduction of GHG emissions and for products and technologies related to recycling Examples • Growing markets for EVs and fuel cell vehicles (2020 to 2050) • Growing markets for components and materials for high-efficiency communication, due to change in consumer behavior (including expansion of the sharing economy and more efficient logistics with the use of IT) • Shift to low-carbon energy sources • Expansion of CCUS*2 (2030 onward) • Expansion of the circular economy, with the aim of reducing GHG emissions derived from fossil fuels (2020 to 2050) • Growing markets for energy-saving homes and building materials	● Increased demand for SSS*3-designated products ● Increasing need for technological development for future SSS-designated products Examples • Components and materials for EVs and fuel cell vehicles • Increased sophistication in IT devices, demand for electronic components necessary to reduce energy consumption, demand for related products and technologies necessary for distributed power systems and semiconductor control devices • Technology that contributes to reducing GHG emissions • Products and technologies for CO_2 recovery, on the back of the expansion of CCUS • Carbon negative technologies • Recycling-related products and technologies • Biologically derived products and technologies • Energy-saving construction materials, such as heat-storing materials	● Enhance development and production systems for products such as lightweight materials, battery materials, and materials for optical products and electronic components ● Develop a process for recycling lithium-ion batteries ● Enhance development and production systems for materials for next-generation power devices and high-efficiency communications ● Promote licensing of technologies that contribute to reducing GHG emissions (for example: the hydrochloric acid oxidation process and the propylene oxide-only process) ● Develop technologies relating to CO_2 recovery ● Develop products that contribute to negative carbon emissions (for example: agricultural materials utilizing fungi, resins produced from microbes) ● Develop plastic recycling technology and build a recycling chain in cooperation with waste management companies ● Develop technology for biologically derived products ● Develop technology for and expand sales of heat storage material products ● Promote the utilization of CO_2-free hydrogen and ammonia
	Increased Regulation on GHG Emissions	● Higher carbon prices (in developed countries, USD 140/ton for 2030, USD 250/ton for 2050)*4	● Increased operational costs due to higher energy taxes including carbon prices (Assuming volume of GHG emissions in fiscal 2050 is about 5.03 million tons/year (Scope 1+2), the same level as in fiscal 2023, and a carbon price between 21,000–37,000 yen per ton of CO_2, our expense burden will increase by about 110-190 billion yen per year.)	● Consider carbon-neutral petrochemical complexes and ports ● Switch to highly efficient equipment by actively utilizing government subsidies ● Switch to renewable energy ● Switch fuel to LNG ● Rationalization research for manufacturing processes ● Develop technologies to capture, separate, and utilize GHG, and deploy them in society ● Promote the deployment of GHG emission removal equipment ● Collaborate with other companies to secure a stable supply of clean ammonia
		● Stronger requirements for GHG emissions reductions and making energy-saving performance mandatory ● Phased abolishment of subsidies for fossil fuels (in India and Southeast Asia, etc.) ● Accelerating transition to a circular society and increased regulation ● Increase in calls to promote use of renewable energy from customers	● Lower utilization of high-energy consumption production facilities ● Increase in utility expenses due to an increased proportion of renewable energy	
	Increased Cost of Raw Materials	● More use of resources from circular systems and progress in the transition to lower environmental impact processes ● Increased costs due to more use of recycled materials ● Increase in calls for green procurement	● More difficult to procure raw materials ● Lower profitability of the existing businesses	● Diversify raw material sources ● Evaluate the use of recycled raw materials ● Evaluate self-manufacture of raw materials with unstable supply ● Shift to a local production, local consumption model (for products where raw material procurement costs make up a relatively high proportion of the price)

*1 Common for all scenarios: Situations that can be expected in both the 1.5°C scenario (reduced GHG emissions) and the 4°C scenario (business as usual)

*2 CCUS: Carbon dioxide Capture, Utilization and Storage *3 Sumika Sustainable Solutions *4 Assumptions based on World Energy Outlook 2023

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

Scenario	Risks and Opportunities	Anticipated Situation (Example)	Impact Assessment	Action
4℃ Scenario (Business as Usual)	**Increased Demand for Products and Technologies Adaptable to Climate Change**	● Growing market for crops resistant to environmental changes such as temperature rise and drought ● Spread of infectious diseases due to the impact of climate change	● Increased demand for SSS-designated products ● Increased need for technological development for future SSS-designated products Examples • Biorationals and soil amendments • Agrochemical products adaptable to the change in crop growth • Agents for prevention and treatment of infectious diseases	● Develop products such as biorationals ● Provide solutions that respond to global changes in the environment for agriculture and infectious diseases ● Enhance sales and marketing structures and new product development structures with an eye on changes in demand in targeted markets
	Intensified Climate Disasters due to Temperature Rise	● More impact on plant operations ● Rising sea level, damage from storm surges and floods, and heat waves ● Damage to farmland due to droughts and soil degradation	● Facilities located on seashores and river banks cease operations ● Decreased cost competitiveness of plants due to increased costs for measures to be prepared for disasters ● Decreased demand due to lower agricultural productivity	● Manage and respond to risks from a business continuity planning perspective ● Expand and diversify the regions in which we do business

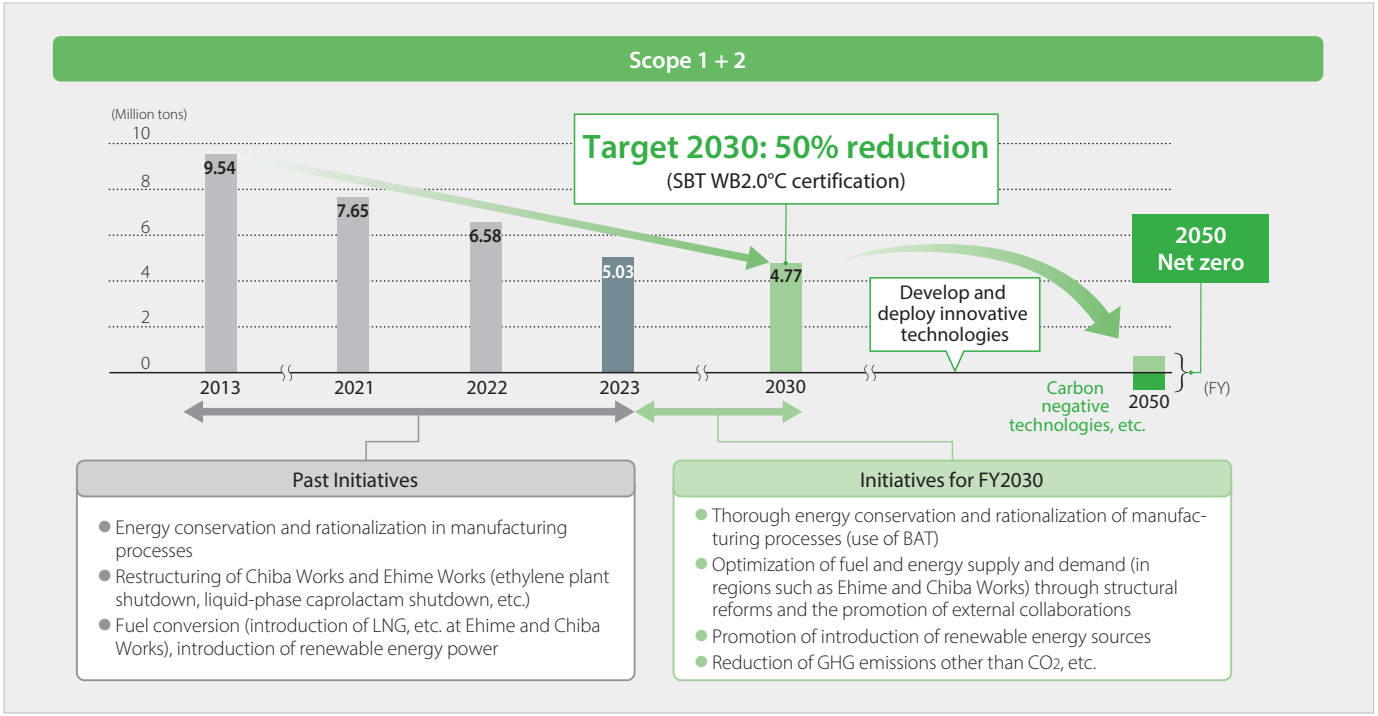
Metrics and Targets (Risk)

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

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

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

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



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

FY2023 Energy Consumption and Greenhouse Gas Emissions

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

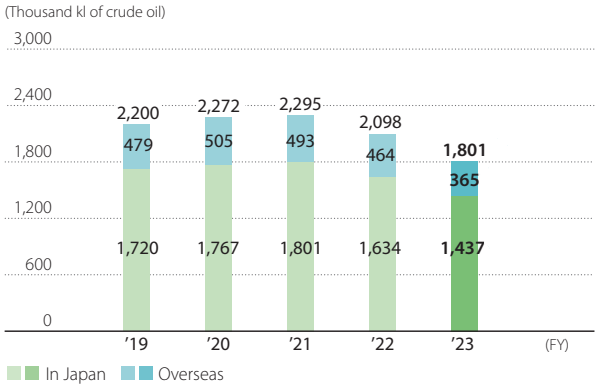
Greenhouse Gas Emissions

(Thousand tons of CO_2e)

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

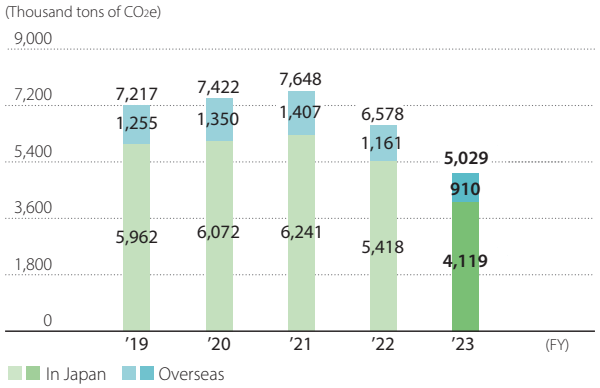
Note: Biomass-derived emissions were 0.6 thousand tons of CO_2e

Energy Consumption (GHG Protocol standards)



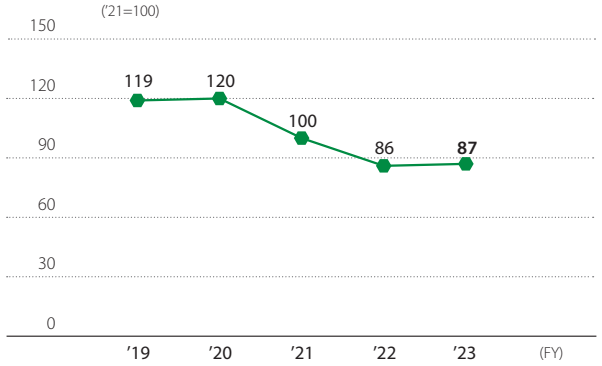
Note: • In line with the GHG Protocol standards, we now include the amount of energy consumed in the production of power and steam sold to external parties by Sumitomo Chemical Group.

Greenhouse Gas Emissions (GHG Protocol standards)



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

Unit Energy Consumption Index (GHG Protocol standards)



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

GHG Emission Reduction Targets (Scope 3)

Scope 3

Reduce GHG emissions (Scope 3: Categories 1 and 3) of major Group companies

by 14% from the FY2020 level by FY2030

(SBT WB2.0°C certification)

Supplier Engagement Initiatives

As part of our efforts to encourage our major suppliers to reduce GHG emissions, we hold an annual supplier information exchange meeting. In 2024, we held a hybrid face-to-face and web-based meeting with 53 major suppliers in Japan to explain our efforts to reduce Scope 3 emissions and to request their cooperation in reducing GHG emissions and sharing information on reductions. In recognition of these efforts, the company has been selected as a "Supplier Engagement Leader," the highest rating in the Supplier Engagement Rating conducted by CDP, an international NGO, for five consecutive years.

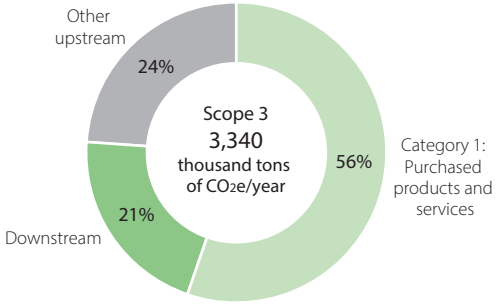
CDP SUPPLIER ENGAGEMENT LEADER 2023

Status of Scope 3 GHG Emissions

(Thousand tons of CO_2e/year)

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

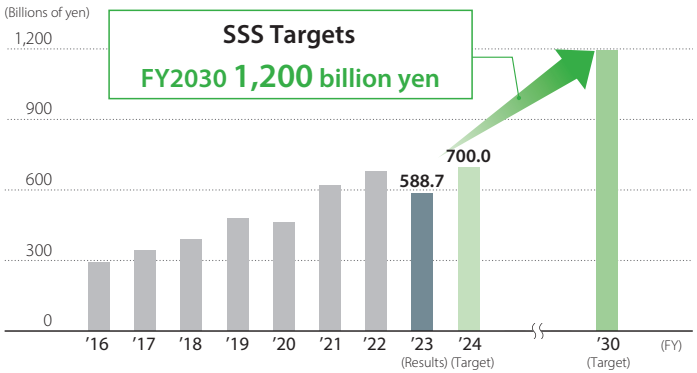
Notes:
- For Scope 3 data, indirect greenhouse gas emissions from business activities throughout the supply chain are calculated separately by category and then added together.
- Calculated for Sumitomo Chemical and Group companies listed on stock indices in Japan (Sumitomo Pharma Co., Ltd.; Koei Chemical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



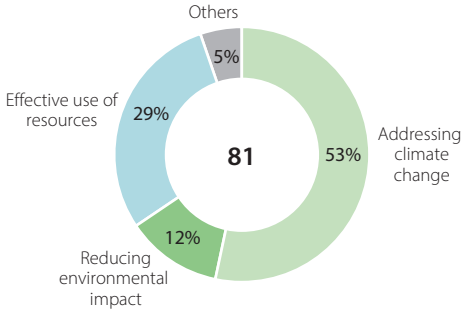
Metrics and Targets (Opportunities)

Sumika Sustainable Solutions (SSS) is used as a metric for climate-related opportunities. SSS is an initiative in which we designate those of our Group's products and technologies that contribute to the fields of climate change mitigation and adaptation, contribute to recycling resources, and sustainable use of natural capital in order to promote their development and spread. The sales revenue from certified products for FY2023 reached 588.7 billion yen. We will continue to advance our efforts towards achieving the FY2030 target of 1.2 trillion yen.

Sumika Sustainable Solutions' Sales Revenue Targets



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



Note: Number of SSS certified products and technologies 81

Science Based Contributions (SBC)

Avoided GHG emissions through products and technologies

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

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

Item		Beneficiaries	FY2022 (million tons)	FY2023 (million tons)
SSS Technology	Propylene oxide (PO)-only process, Hydrochloric acid oxidation process	Licensees	2.7	2.7
SSS End Products	Methionine, Flumioxazin, etc.	Users	5.6	4.4
SSS Materials & Components	Components for Secondary Batteries and aircraft, etc.	Users	Not applicable (under consideration)	

Calculation Method

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

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

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

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

Sumika Sustainable Solutions

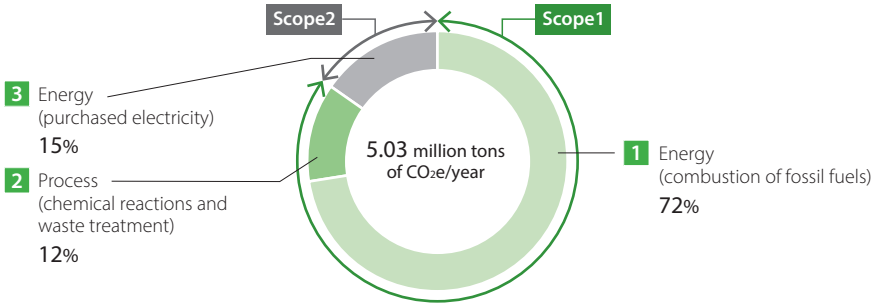
https://www.sumitomo-chem.co.jp/english/sustainability/management/promotion/sss/

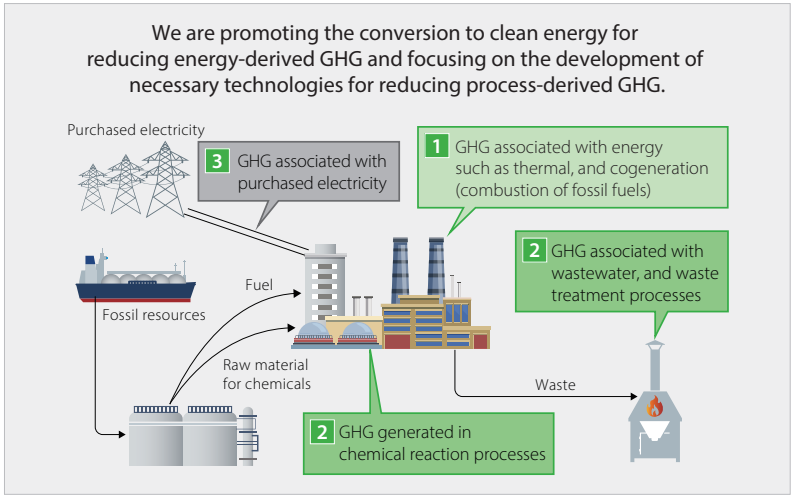
Specific Initiatives for "Obligation"

Major Sources of GHG Emissions from Chemical Plants

The chemical industry is an industry in which raw materials are converted into products through chemical reactions that are driven by electricity, heat from steam, and other forms of energy. In FY2023, 72% of our GHG emissions came from 1 Energy (combustion of fossil fuels), 12% from 2 Process (chemical reactions and waste treatment), and 15% from 3 Energy (purchased electricity). We aim to reduce GHG emissions by focusing on the conversion to clean energy for energy-derived GHG and on the development of necessary technologies for process-derived GHG.

■ GHG Emissions in FY2023





1 Reduction of GHG Emissions from Energy (combustion of fossil fuels): Fuel Conversion

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

In March 2022, at Ehime Works, Niihama LNG Co., Ltd.* began operating the Niihama LNG Station, which supplies LNG instead of conventional coal or heavy oil. In November 2022, Sumitomo Joint Electric Power Co., Ltd. started operations of the Niihama North Gas-Fired Power Plant, a facility it constructed that uses LNG. These efforts will result in a 650,000-ton annual reduction in CO_2 emissions. In January 2024, we began operating highly efficient gas turbine power generation equipment at Chiba Works that uses LNG instead of the existing petroleum coke. With the construction of this equipment, we will reduce annual CO_2 emissions by over 240,000 tons (equivalent to around 20% of the CO_2 emitted by Chiba Works). It will also enable the supply of power to neighboring Group companies as we work hard to reduce GHG emissions across the entire Group.

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

■ Fuel Conversion and CO_2 Emissions Reduction

Ehime region

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

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

Niihama North Gas-Fired Power Plant

Niihama LNG Terminal and Ehime Works

Chiba region

Fuel conversion: Petroleum coke ▶ **LNG**

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

Chiba Works' highly efficient gas turbine power generation equipment

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

Transition to Clean Fuels

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

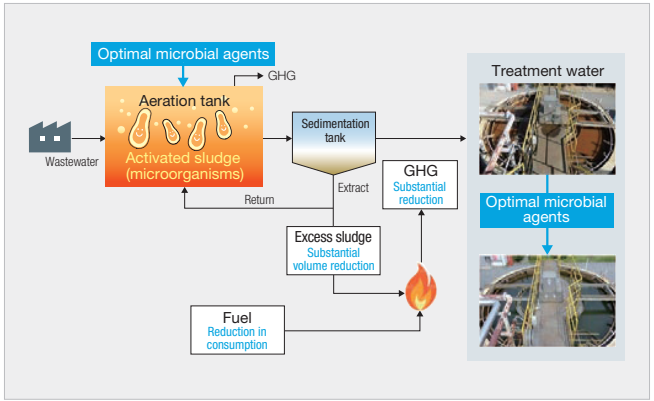
- Focused on clean ammonia (blue and green), we are continuing discussions with Yara, a major foreign ammonia manufacturer, regarding the possibility of its stable procurement.
- Four domestic ammonia suppliers, UBE Corporation, Mitsui Chemicals, Inc., Mitsubishi Gas Chemical Company, Inc., and Sumitomo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

Climate Change Mitigation and Adaptation:
Initiatives through Regional Collaboration

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

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

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



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

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

Initiatives Aimed at Reducing GHG Emissions at Each Worksite

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

State of Installing LED Lighting

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

Chiba Works: Introduction of EV Bus

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

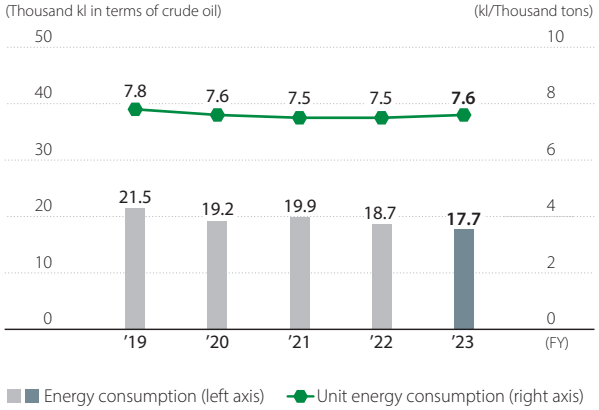
EV bus

Logistics Initiatives

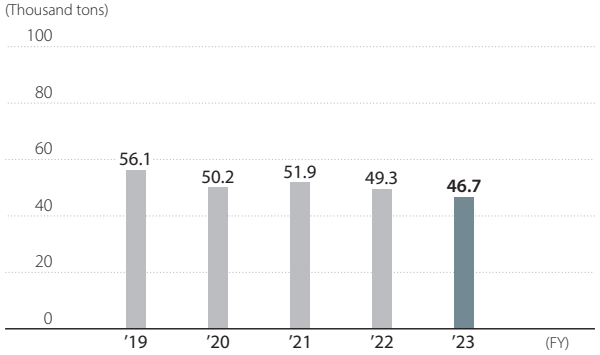
Sumitomo Chemical continues to promote modal shift, or transportation by more efficient and environmentally friendly modes, such as rail and ship instead of trucks. In fiscal 2023, the overall volume of cargo transported fell year on year, and, as a result, energy consumption (crude oil equivalent) and carbon dioxide emissions decreased. However, unit energy consumption increased 0.9% overall due to a rise in coastal transportation. This was an average 0.4% deterioration over the past five years. We will continue aiming to improve unit energy consumption by our target of 1% or more.

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

Energy Consumption and Unit Energy Consumption



CO_2 Emissions



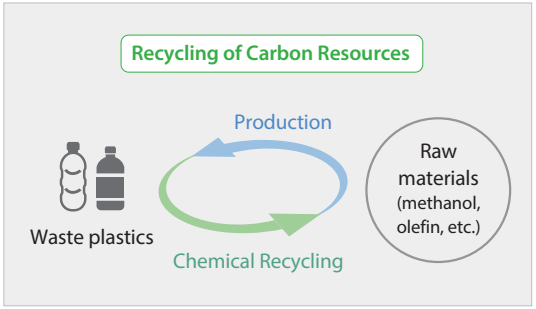
Note: Calculated for Sumitomo Chemical and a Group company in Japan (specified consigner Nippon A&L Inc.)

Specific Initiatives for “Contribution”

Establishment of Carbon Resource Recycling System

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

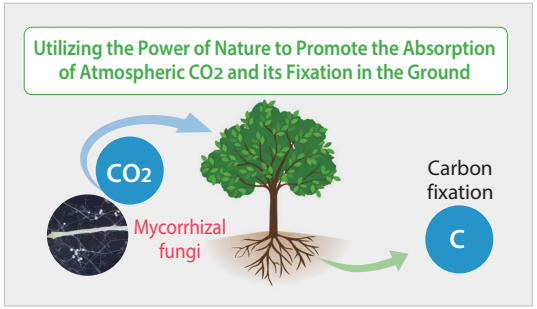
Contribute to Recycling Resources



Challenges to Carbon Negative Emissions

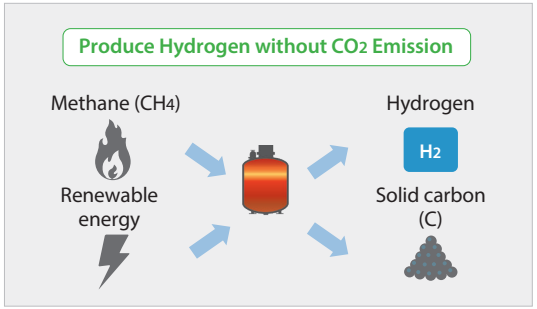
We are developing a technology whereby attaching useful micro-organisms existing in soil to the roots of plants and allowing them to coexist, we not only promote the absorption of CO_2 by plants through photosynthesis, we also fix CO_2 in the ground in the form of carbon compounds. This will enable ordinary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

Sustainable Use of Natural Capital



Response to Methane Gas

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



External Cooperation Initiatives

Initiatives through Regional Collaboration

Since there are limits to what individual companies can do to achieve carbon neutrality, it is necessary to accelerate regional collaboration with external parties such as companies outside our group and government agencies. In addition to participating in the Keiyo Coastal Industrial Complex Council on Carbon Neutrality, which was established in November 2022 mainly in Chiba Prefecture, we are also studying ways to achieve carbon neutrality, such as securing biomass feedstock and recovering waste, in cooperation with Maruzen Petrochemical Co. Ltd. and Mitsui Chemicals, Inc. In the Shikoku and Setouchi region, we are collaborating on efforts to construct a clean ammonia supply chain by participating in “the Council for Utilizing Namikata Terminal as a Hub for Introducing Fuel Ammonia”, which was launched primarily by Mitsubishi Corporation and Shikoku Electric Power Company.

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

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

External Cooperation Initiatives

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

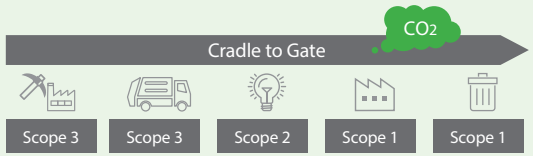
Although the evaluation of product CFP is essential to reduce GHG emissions in society, it is not easy to analyze the CFP of chemical products due to the complexity of their manufacturing processes. In response, we have developed our own automated calculation tool and calculated the CFP of approximately 20,000 products. Currently, we are expanding the scope of evaluation to Group company products. We also provide the tool free of charge to other companies, and at present, more than 110 companies are using the tool, and we have also started collaboration with the Japan Chemical Industry Association. Additionally, we are considering expanding the use of CFP-TOMO® for assessing environmental impacts other than GHG emissions, such as water.

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

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

Created the original automatic CFP calculation tool

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



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

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

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

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

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

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

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

Representatives receiving the award

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

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