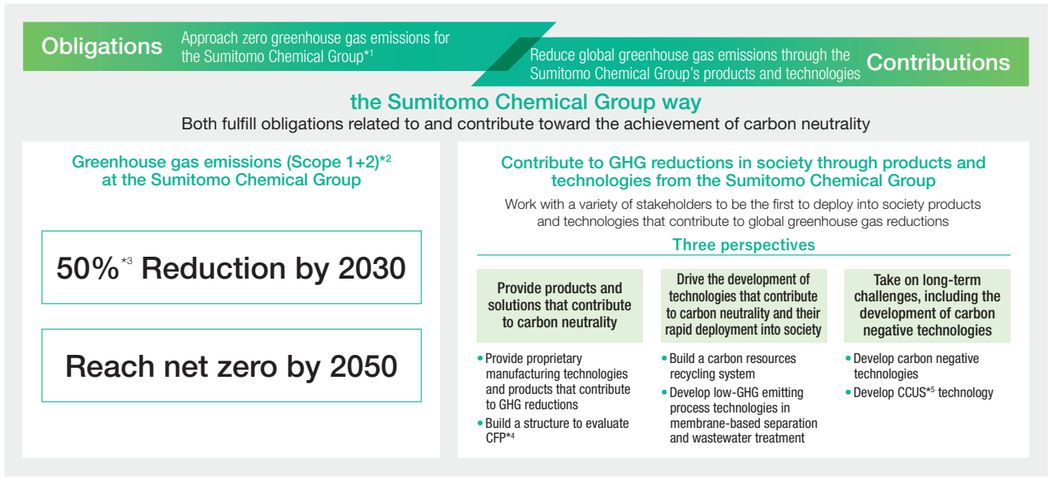
Strengthening the Foundation for Value Creation

04 Climate Change Mitigation and Adaptation

Sumitomo Chemical regards climate change as a social issue that chemical companies should take the lead in addressing, and has been making various efforts to solve it from early on. In recent years, as the movement toward carbon neutrality has gained momentum around the world, in december 2021, our company 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.

Grand Design toward Achieving Carbon Neutrality



*1 Referring to Sumitomo Chemical Co., Ltd. and its consolidated subsidiaries in and outside Japan *2 Scope1：Greenhouse gases directly emitted by plants, such as in the use of fuels and in manufacturing products Scope2：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 CFP：Carbon Footprint of Products *5 CCUS：Carbon dioxide Capture, Utilization and Storage

Disclosure in Line with TCFD Recommendations

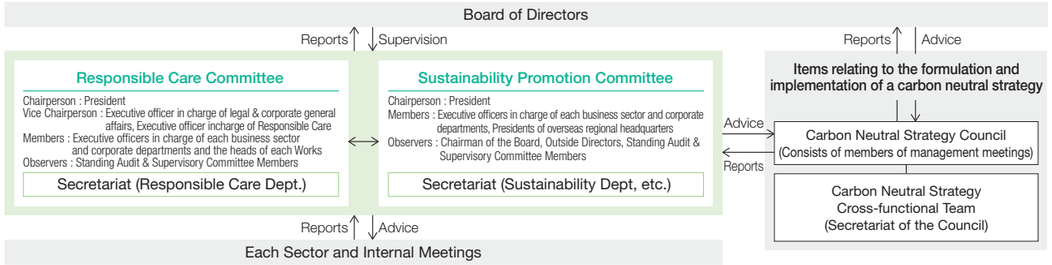
The TCFD four recommended In line with the four recommended disclosure items, "Governance," "Risk Management," "Strategy," and "Metrics and Targets," the Group's efforts to address climate change issues are introduced on pages 50-59. Please refer to the Sustainability Report for other information on climate-related information.

Climate Change Mitigation and Adaption (Sustainability Report)

Governance

Our company 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 at least once a quarter on issues related to the promotion of sustainability, including climate change.

Structures for Responding to Climate Change



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 a 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.

Risk Management (Sustainability Report)

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 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 both 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 both the impacts on our businesses and future actions that need to be taken.

Scenario Analysis (excerpt)

Scenario	Risks and Opportunities	Impact on our Company	Risks	Opportunities	Our Response
Common	Increasing Demands for Disclosure of Information	• Improvement of reputation among stakeholders through enhanced information disclosure • Increased cost of compliance	●	●	• Formulate and release our Grand Design for achieving carbon neutrality • Promote wider use of the carbon footprint calculation tool (CFP-TOMO™) ➡ **P.53** • Disclosure of quantitative GHG reduction contributions through our products and technologies (Science Based Contributions) ➡ **P.55**
1.5°C (Reduced GHG Emissions)	Contributing to the Mitigation of Climate Change	• Increase in demand for Sumika Sustainable Solutions (SSS)-designated products due to expansion of the market for products and technologies that contribute to GHG emission reductions, as well as expansion of needs for technological development of future SSS-designated candidate products		●	• Development and diffusion of products that contribute to GHG emission reductions ➡ **P.55** • Develop plastic recycling technology ➡ **P.53** • Develop products that contribute to negative carbon emissions ➡ **P.53** • Promote licensing of technologies that contribute to reducing GHG emissions ➡ **P.41** • Promote the feedstock shift to green ammonia.
	Increased Regulation on GHG Emissions	• Increased operational costs due to higher energy taxes including carbon prices* • Phasing out subsidies for fossil fuels and requests from customers to promote the use of renewable energy	●		• Consider carbon-neutral petrochemical complexes and ports ➡ **P.53** • Switch to renewable energy ➡ **P.52** • Switch fuel to LNG ➡ **P.52** • Consider transition to clean fuels such as hydrogen and ammonia ➡ **P.52**
4°C (Business as Usual)	Increased Demand for Products and Technologies adaptable to Climate Change	• Increased demand for SSS-designated products and growing needs for technological development of future SSS-designated candidate products due to the expanding market for crops that are resistant to environmental changes such as rising temperatures and drought, etc.		●	• Provide solutions that respond to global changes in the environment for agriculture and infectious diseases
	Intensified Climate Disasters due to Temperature Rise	• Decrease in cost competitiveness of factories due to increased costs for disaster countermeasures such as sea level rise, storm surge damage, flood damage, heat wave generation, etc. • 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

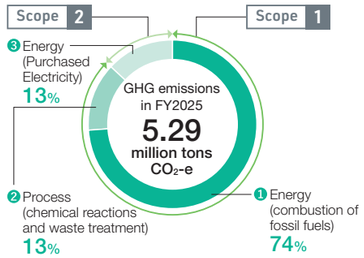
*Assuming that carbon prices in developed countries will rise to $180/ton in 2035 and $250/ton in 2050 (based on World Energy Outlook 2025), the total GHG emissions of the Group in FY2050 will be approximately 5.29 million tons/year (Scope 1+2), the same level as in FY2025, and the carbon price will be 27,000–38,000 yen/t-CO_2, an increase in burden of 140–210 billion yen per year.

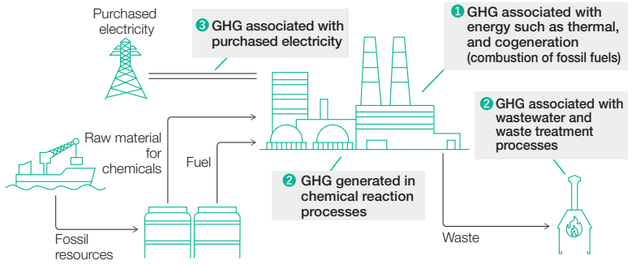
The full scenario analysis (Sustainability Report)

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 FY2025, 74% of our GHG emissions came from ❶ **Energy (combustion of fossil fuels)**, 13% from ❷ **Process (chemical reactions and waste treatment)**, and 13% from ❸ **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.





❶ Reduction of GHG from energy (combustion of fossil fuels): Fuel conversion

Transition from Coal, Petroleum Coke, and Heavy Oil to LNG

- In FY2022, started operation of thermal power plant using LNG instead of existing fossil fuels in Ehime region



- In FY2023, we discontinued the existing petroleum coke power generation facilities and commenced operations of a high-efficiency gas turbine power generation facility using LNG in the Chiba region.



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

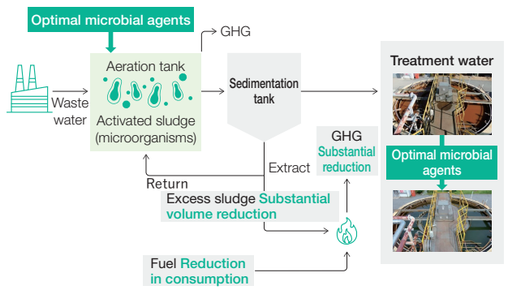
Transition to Clean Fuels

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. We are continuing to secure a stable supply of ammonia, and focusing on clean ammonia by the most effective use of the existing large tanks in the Niihama area of Ehime Prefecture. We are also participating in regional collaboration initiatives to build a supply chain for ammonia and hydrogen for future fuel applications.

Initiatives through Regional Collaboration

❷ Reduction of GHG from process (chemical reaction and waste treatment): Creating synergies to address climate, water, and resource challenges through innovation in wastewater treatment processes

Our company is promoting biotechnological wastewater treatment. This technology contributes to water quality preservation and the circular use of water resources while improving wastewater treatment performance. At the same time, by utilizing optimal microbial agents, it significantly reduces the generation of excess sludge and simultaneously achieves reductions in GHG emissions and fuel consumption associated with incineration.



❸ Reduction of GHG from energy (purchased electricity): Use of renewable energy

At our Oita Works, we have achieved GHG reductions of approximately 20% by converting 100% of purchased electricity to renewable energy, and approximately 10% by switching from heavy oil to city gas, resulting in a total GHG reduction of approximately 30% of the Oita Works' emissions compared to FY2013.

Reduction of GHG from energy (Sustainability Report)

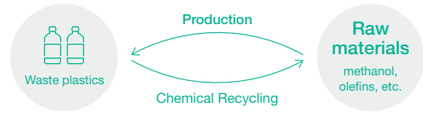
Specific Initiatives for "Contribution"

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

Recycling of carbon resources

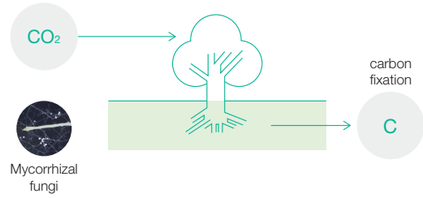


Challenges to Carbon Negative Emissions

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

Sustainable use of natural capital

Utilizes the power of nature to promote absorption of atmospheric CO_2 and its fixation in the ground



External Cooperation Initiatives

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

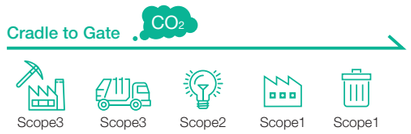
Although the evaluation of product CFP is essential to reduce GHG emissions in society, it is not easy to analyze the CFP of chemical products due to the complexity of their manufacturing processes. In response, we have developed our own calculation tool and calculated the CFP of approximately 20,000 products. We provide the tool free of charge to other companies. It is now used by many companies via 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. In chemical companies, it is common practice to conduct assessments within the scope of "Cradle to Gate," covering everything from raw material procurement to manufacturing.

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

Created the original CFP calculation tool

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



Initiatives through Regional Collaboration

Since there are limits to what individual companies can do to achieve carbon neutrality, it is necessary to accelerate regional collaboration with external parties such as companies outside our group and government agencies. We participate in the Keiyo Coastal Industrial Complex Council on Carbon Neutrality, which was established in November 2022 mainly in Chiba Prefecture. We will also continue working in collaboration with local companies, nations, municipalities, etc. on the Keiyo Coastal Industrial Complex Council on GX , which launched in March 2026. In addition, we are 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. Furthermore, in the Shikoku and Setouchi regions, we are collaborating with government agencies and nearby companies on efforts to construct a clean ammonia supply chain.

External Cooperation Initiatives (Sustainability Report)

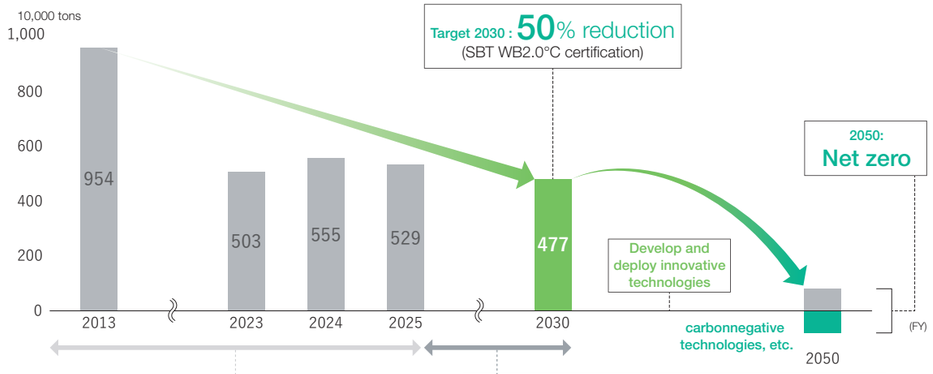
Metrics and Targets (Risk)

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

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

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

Scope 1+2 GHG Emissions Trends and Reduction Targets



Past Initiatives

- Energy conservation and rationalization in manufacturing processes
- Restructuring of Chiba Works and Ehime Works (Ethylene plant shutdown, liquid-phase caprolactam shutdown, etc.)
- Fuel conversion (introduction of LNG, etc. at Ehime and Chiba), introduction of renewable energy power

Initiatives for FY2030

- Thorough energy conservation and rationalization of manufacturing processes (use of BAT)
- Optimization of fuel and energy supply and demand (in regions such as Ehime and Chiba) through structural reforms and the promotion of external collaborations
- Promotion of introduction of renewable energy sources
- Avoided GHG emissions other than CO_2, etc.

Scope 3 Supplier Engagement Initiatives

GHG Emission Reduction Targets (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)

We are promoting climate actions through dialogue with our suppliers, and at the same time setting reduction targets for indirect GHG emissions (Scope 3) across the supply chain by 2030, together with reduction targets for GHG emissions from our business activities (Scope 1 and 2). Through these initiatives, we have renewed our certification under the Science Based Targets (SBT) initiative at the "well-below 2°C" level. As one example, we explain our group's efforts to achieve carbon neutrality to our key domestic suppliers annually while requesting their cooperation in reducing GHG emissions. These efforts have been recognized by CDP, an international NGO. In the CDP's Supplier Engagement Assessment 2025, the Company received an "A" score, earning the highest rating for seven consecutive years.

Supplier Engagement Leader CDP 2025

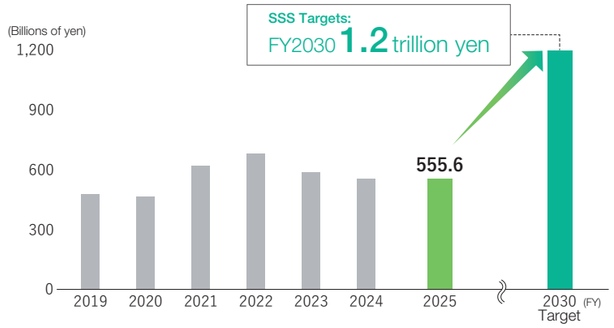
Metrics and Targets (Opportunities)

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 designated products for FY2025 reached 555.6 billion yen. We will continue to advance our efforts towards achieving the FY2030 target of 1.2 trillion yen.

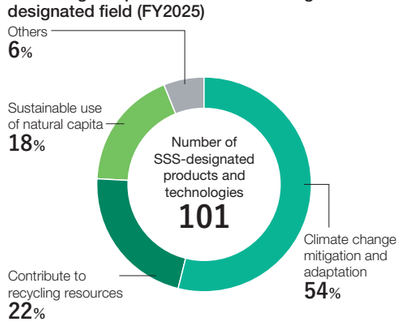
Contribution through Business Sumika Sustainable Solutions (Sustainability Report)

Sumika Sustainable Solutions™

Sales revenue targets



Percentage of products and technologies in each designated field (FY2025)



Science Based Contributions -Contribution to GHG Reduction Across Society Through the Utilization of SSS-Designated Products and Technologies-

We have established the "Science Based Contributions (SBC)" as a metric to more clearly demonstrate the contribution of our products and technologies towards achieving carbon neutrality. The SBC quantitatively and scientifically calculates the amount of GHG reductions achieved in society through the use of SSS-designated 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

Item	Beneficiaries	FY2024 (million tons)	FY2025 (million tons)
SSS Technology (Propylene oxide (PO)-only process, Hydrochloric acid oxidation process)	Licensees	**2.9**	**2.9**
SSS End Products (Methionine, Flumioxazin, etc.)	Users	**3.7**	**4.2**
SSS Materials & Components (Components for secondary batteries and aircraft, etc.)	Users	Not applicable (under consideration)	
Total		**6.6**	**7.1**

Calculation method

SSS are classified into the three categories of technology, end products, and materials/ components, and SBC 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.