

Contribute to the Environment

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, our company has been leveraging the technological capabilities and expertise we have cultivated over the years to actively promote group-wide initiatives aimed at achieving carbon neutrality.

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 47-52. Please refer to the Sustainability Report for other information on climate-related information.

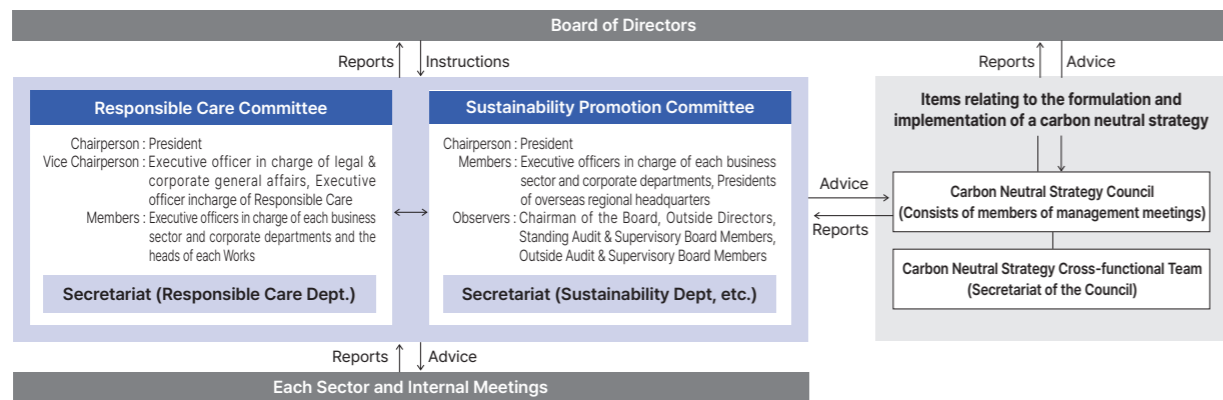
→ [Climate Change Mitigation and Adaptation \(Sustainability Report\)](#)

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 at least once a quarter 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

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	<ul style="list-style-type: none"> Improvement of reputation among stakeholders through enhanced information disclosure Increased cost of compliance 	●	●	<ul style="list-style-type: none"> Formulate and release our Grand Design for achieving carbon neutrality
					<ul style="list-style-type: none"> Develop a carbon footprint calculation tool (CFP-TOMO[®]) and provide it to other companies for free → P.50 Disclosure of quantitative GHG reduction contributions through our products and technologies (Science Based Contributions) → P.52
1.5°C (Reduced GHG Emissions)	Increased Demand for Products and Technologies Contributing to the Mitigation of Climate Change	<ul style="list-style-type: none"> Increase in demand for Sumika Sustainable Solutions (SSS)-certified 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-certified candidate products 		●	<ul style="list-style-type: none"> Development and diffusion of products that contribute to GHG emission reductions → P.52 Develop plastic recycling technology → P.50 Develop products that contribute to negative carbon emissions → P.50 Promote licensing of technologies that contribute to reducing GHG emissions → P.66 Promote the utilization of CO₂-free hydrogen → P.50
					<ul style="list-style-type: none"> Increased operational costs due to higher energy taxes including carbon prices* Switch to renewable energy → P.49 Switch fuel to LNG → P.49 Collaborate with other companies to secure a stable supply of clean ammonia → P.49
4°C (Business as Usual)	Increased Demand for Products and Technologies adaptable to Climate Change	<ul style="list-style-type: none"> Increased demand for SSS-certified products and growing needs for technological development of future SSS-certified candidate products due to the expanding market for crops that are resistant to environmental changes such as rising temperatures and drought, etc. 		●	<ul style="list-style-type: none"> Provide solutions that respond to global changes in the environment for agriculture and infectious diseases
					<ul style="list-style-type: none"> 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
	Intensified Climate Disasters due to Temperature Rise		●		<ul style="list-style-type: none"> Manage and respond to risks from a business continuity planning perspective Expand and diversify the regions in which we do business

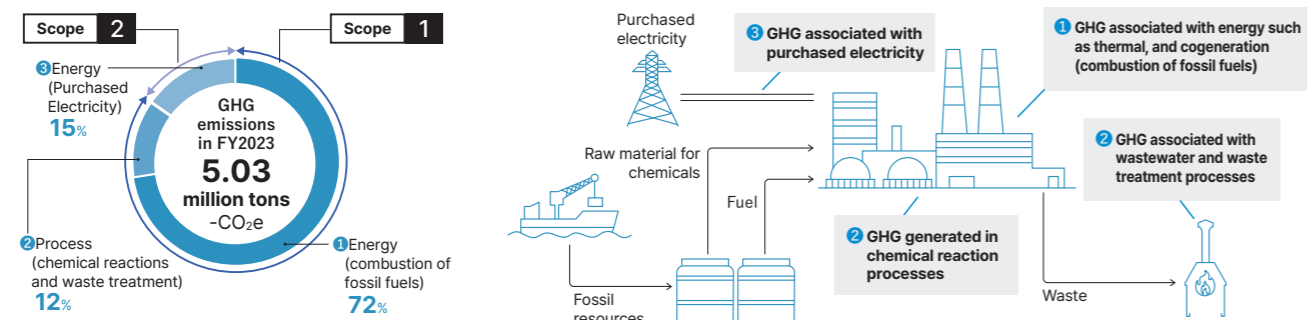
*Assuming that carbon prices in developed countries will rise to \$140/ton in 2030 and \$250/ton in 2050 (based on World Energy Outlook 2023), the total GHG emissions of the Group in FY2050 will be approximately 5.03 million tons/year (Scope 1+2), the same level as in FY2023, and the carbon price will be 21,000-37,000 yen/t-CO₂, an increase in burden of 110-190 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 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.



① 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 January 2024, 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

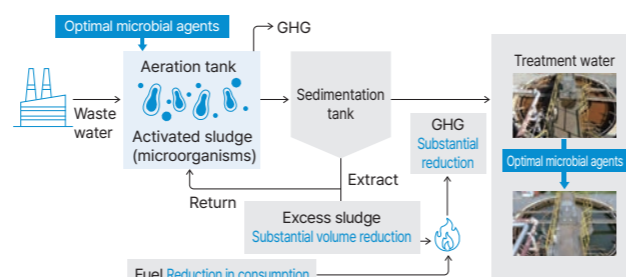
Hydrogen and ammonia are gaining attention as clean fuels that do not emit CO₂ during combustion, with ammonia also being recognized as a hydrogen carrier. Our company is undertaking the following initiatives in this regard.

- 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.

→ Initiatives through Regional Collaboration

② Reduction of GHG 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 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.

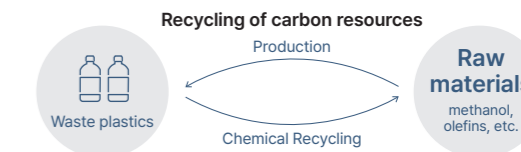
→ Reduction of GHG from energy (Sustainability Report)

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.

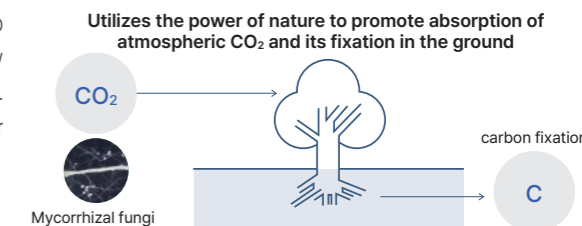
→ Contribute to recycling resources



Challenges to carbon negative emissions

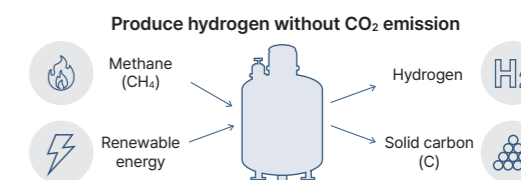
We are developing a technology whereby attaching useful microorganisms existing in soil to the roots of plants and allowing them to coexist, we not only promote the absorption of CO₂ by plants through photosynthesis, we also fix CO₂ in the ground in the form of carbon compounds. This will enable ordinary fields, forests, and other natural spaces to absorb and fix even greater amounts of CO₂, 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 CO₂-free hydrogen. To address this issue, we are developing a technology to produce hydrogen from methane without CO₂ emissions. This technology will help reduce methane, a GHG, and contribute to the realization of a carbon neutrality.



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 CO₂ 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.

→ External Cooperation Initiatives (Sustainability Report)

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.



Initiatives through Regional Collaboration

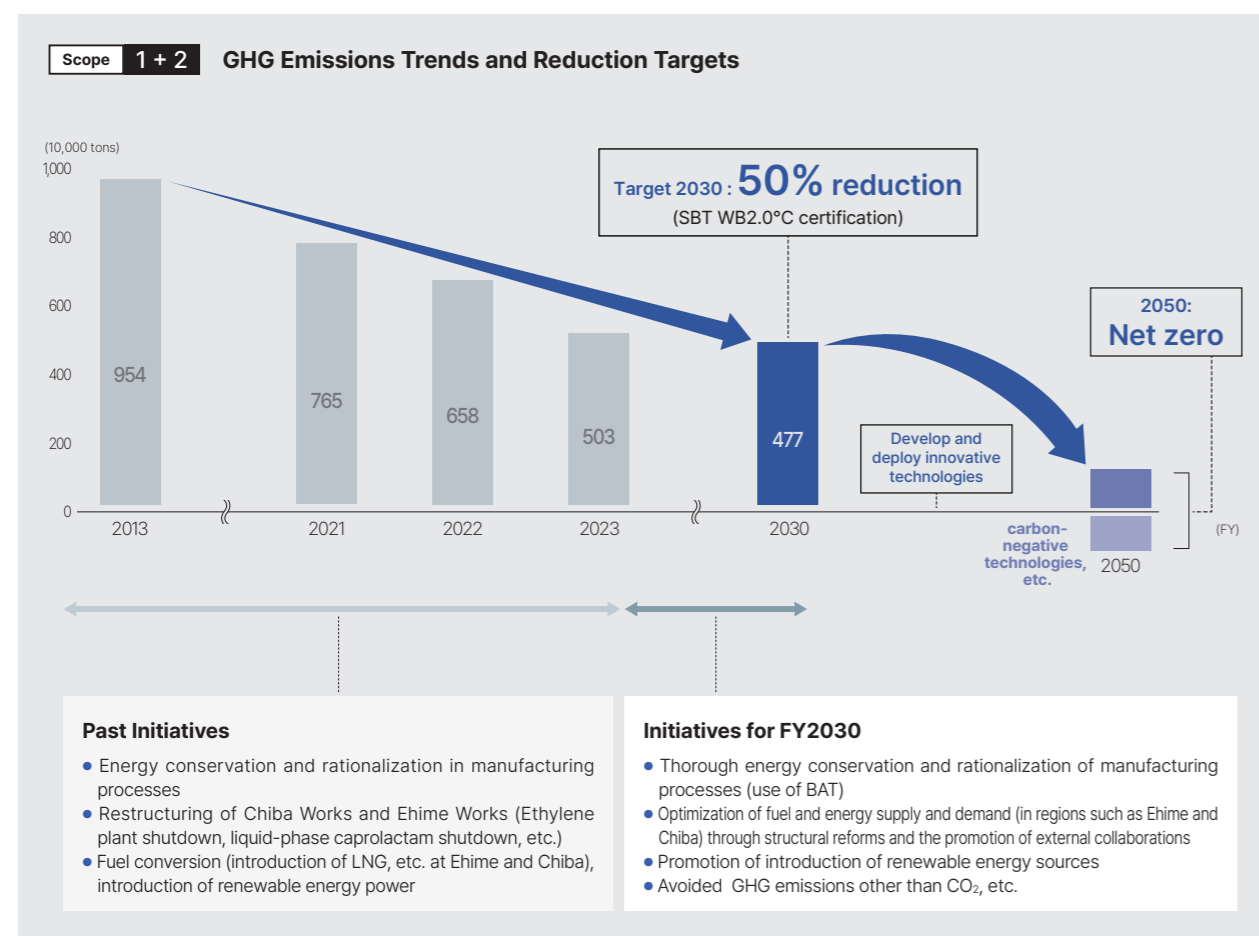
Since there are limits to what individual companies can do to achieve carbon neutrality, it is necessary to accelerate regional collaboration with external parties such as companies outside our group and government agencies. In addition to participating in the Keiyo Coastal Industrial Complex Council 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. Additionally, in the Shikoku and Setouchi regions, 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. We are proceeding with the study about the port decarbonization plan which is currently promoted by government agencies in cooperation with the local community.

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 CO₂ emitted from plants, etc.



Scope 3 Supplier Engagement Initiatives

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

14% from FY2020 by FY2030

(SBT WB2.0°C certification)

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.

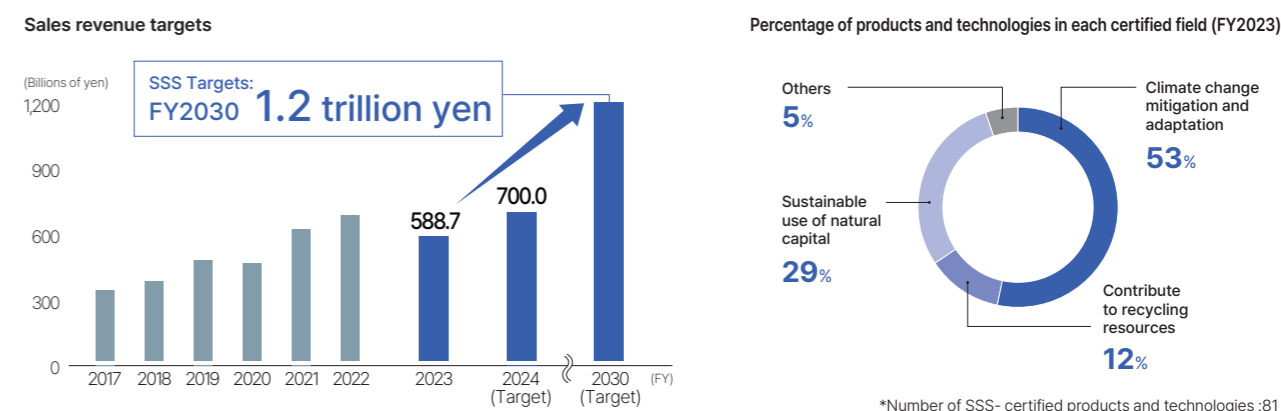


Metrics and Targets (Opportunities)

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.

→ Contribution through Business Sumika Sustainable Solutions (Sustainability Report)

Sumika Sustainable Solutions



Science Based Contributions

Contribution to GHG Reduction Across Society Through the Utilization of SSS-Certified 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-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

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)	
Total		8.3	7.1

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 N₂O 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.