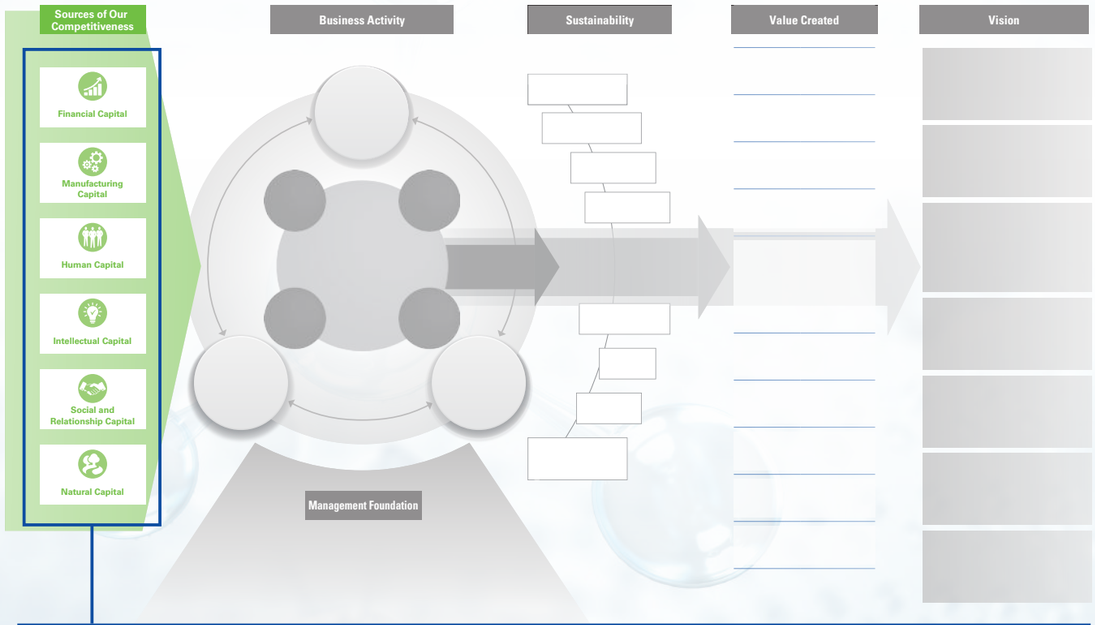
Sources of competitiveness that support the sustainable development of the Shin-Etsu Chemical Group



Financial Capital

On our solid financial foundation, we will make aggressive capital investments for sustainable growth

- Equity ratio **82.7%**
- Net assets **4,424.0 billion yen**
- Capital expenditures **406.8 billion yen**

Manufacturing Capital

We aim to achieve sustainable growth by monitoring global demand trends and making timely and appropriate capital investments

- Domestic production bases: **17 companies, 40 bases**
- Overseas production bases: **17 countries, 67 bases**

Human Capital

Developing optimal staffing with T-shaped skill human resources in pursuit of a more efficient, smarter, and leaner way of working

- Operating income per employee **26.96 million yen**

Intellectual Capital

Promoting rapid, field-linked R&D and strategic IP management to protect our business

- Research centers located inside plants
- Selected as Clarivate Top 100 Global Innovator™ for **13 consecutive years**

Social and Relationship Capital

Our commitment to respecting human rights and building strong relationships of trust with customers

Natural Capital

In addition to our commitment to carbon neutrality by 2050, we are focusing on conservation of water resources, biodiversity, and waste reduction

- Greenhouse gas emissions (emission intensity index of production volume relative to FY1990) (Shin-Etsu Group) **57.0%**

Financial Capital

On our solid financial foundation, we will make aggressive capital investments for sustainable growth

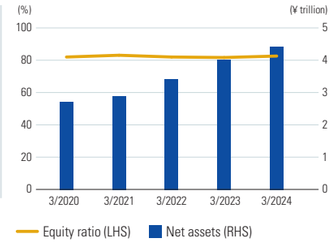
Striving to maintain price levels in the face of softening market conditions

In the fiscal year ended March 31, 2024 (FY2023), the polyvinyl chloride (PVC) business faced stagnant housing construction in the U.S. amid rising mortgage rates as well as export pressure from Chinese manufacturers. Furthermore, in our general-purpose silicone product lines, inventory adjustments and softening market conditions continued due to the sluggish Chinese economy. In this environment, despite our efforts to maintain our price levels and expand sales of high-performance products, our operating income was ¥701.0 billion (down 29.8% year on year), and net income attributable to owners of parent was ¥520.1 billion (down 26.6% year on year). In addition, total net assets were ¥4,424.0 billion (up 9.9% from the end of the previous fiscal year), the equity ratio was 82.7%, ROIC was 19.4%, and ROE was 12.8%.

Equity ratio/Net assets

Equity ratio (as of March 31, 2024) **82.7%**

Net assets (as of March 31, 2024) **4,424.0 billion yen**

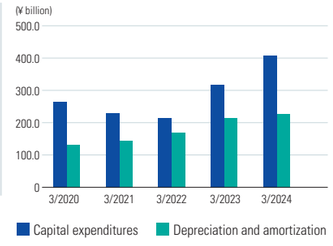


Continued capital investment for sustainable growth

To enhance competitiveness and sustain growth, Shin-Etsu Chemical seeks to enhance corporate value through the active and timely use of retained earnings. The Shin-Etsu Group's capital investment in FY2023 totaled ¥406.8 billion (up 27.9% year on year), reflecting progress in planned investments to expand capacity for Shintech's PVC and high-performance silicone products. Capital investment for FY2024 is expected to total ¥370 billion. To expand the semiconductor lithography materials business, we have decided to build a plant in Gunma Prefecture, which will serve as the fourth site for this project (the first phase will be completed in 2026, with an investment of approximately ¥83 billion, entirely self-financed).

Capital expenditures/Depreciation and amortization

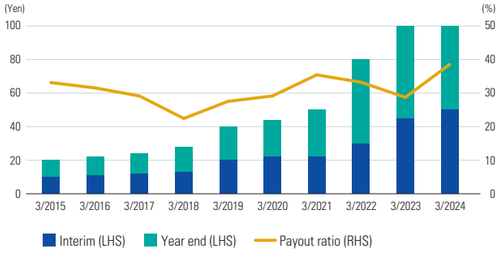
Capital expenditures (for the year ended March 31, 2024) **406.8 billion yen**



Aiming for a 40% dividend payout ratio over the medium to long term

The annual dividend for FY2023 was ¥100 per share (payout ratio of 38.5%), the same amount as the previous year. We have been striving for stable dividends using a dividend payout ratio of around 35% as a medium- to long-term target. Over the past 10 years, the dividend payout ratio has been 31%. Going forward, while balancing growing business earnings and maintaining solid financial foundations, we will aim for a dividend payout ratio of 40% over the medium to long term. Furthermore, as part of our efforts to return profits to shareholders, we repurchased and retired approximately ¥100 billion (22 million shares) of treasury stock in FY2023. With regard to the purchase of treasury shares, the Company will determine the necessity of implementing such purchases as appropriate.

Cash dividends per share/Payout ratio (Note)



(Note) On April 1, 2023, the Company executed a 5-for-1 stock split of its common stock. "Cash dividends per share" is calculated based on the number of shares after the stock split.

Manufacturing Capital

We aim to achieve sustainable growth by monitoring global demand trends and making timely and appropriate capital investments

Basic policy on capital investment

To fulfill its supply responsibilities as a material manufacturer, the Shin-Etsu Group makes timely and appropriate capital investments to strengthen stable supply and improve quality based on information and requests obtained from industry-leading companies around the world. Our solid financial base and ability to generate cash flow enable us to make flexible decisions and aggressively invest even in an ever-changing business environment.

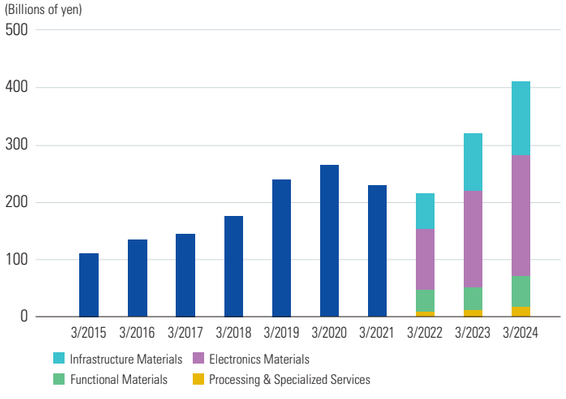
Current status of capital investment

We are steadily making capital investments that support the growth of the Group, including a PVC resin facility expansion project at Shintech Inc. in the U.S., as well as production capacity enhancement, productivity improvements and streamlining, quality improvement, maintenance, upgrades, and environmental measures. The status of major capital investments is as follows.

List of ongoing capital investments (that have been announced)

Business Segment	Products	Projects	Investment Amount
Infrastructure Materials	PVC	New facility expansion [Phase 2] (U.S.)	$1.25 billion
Electronics Materials	Semiconductor lithography materials	Build a new manufacturing and research-and-development base (Japan)	¥83 billion
Functional Materials	Silicone resin	Reinforcement of the production capacity for advanced functional products line (Japan)	¥80 billion
	〃	Expansion the applications of our silicones products and work to enhance the advanced functionality of our products line-up and expand our environmentally friendly silicones (Japan, Thailand, etc.)	¥100 billion
	Cellulose derivatives	Expansion of manufacturing facilities (Japan)	¥10 billion

Capital investment



Sales by Manufacturing Location for Each Segment (FY2023)

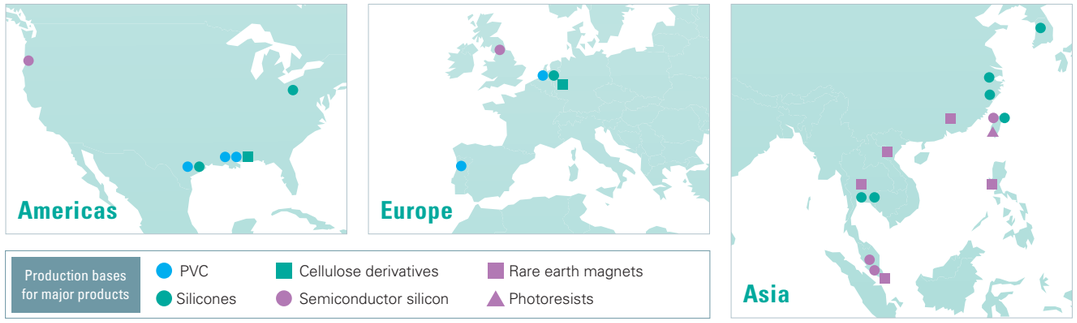
(Billions of yen)

	Goods Manufactured in Japan	Goods Manufactured overseas	Total
Infrastructure Materials	133.0	877.2	1,010.2
Electronics Materials	674.1	176.3	850.4
Functional Materials	269.7	155.4	425.2
Processing & Specialized Services	94.4	34.4	128.9
Consolidated	1,171.4	1,243.5	2,414.9

Risk-aware supply network

In addition to building a local production system directly linked to local demand, the Shin-Etsu Group has 67 overseas production bases in 17 countries, mainly in regions with low country risk, to ensure that our production costs are the most competitive in the world. In addition, as geopolitical risks rise, we are diversifying our raw material procurement across different regions and suppliers, while establishing multiple production bases globally to strengthen our ability to ensure a stable supply to our overseas customers, who account for approximately 80% of our sales.

Production bases for major products



G-Committee continues to relentlessly pursue technological innovation

The G Committee, a committee structure for rationalization, established in 1992, plays an important role in improving the technological capabilities of the Shin-Etsu Group. Its main objective is to pursue technological innovation based on ideas and principles not bound by precedents and conventional wisdom, and Group companies, including Shin-Etsu Chemical and Shin-Etsu Handotai, take up the challenge of implementing these innovations.

The G-Committee continues to contribute to earnings through continuous initiatives rather than one-time streamlining. To date, the committee has tackled some 25,000 themes to implement innovative technologies, achieve labor and energy savings through automation, and improve productivity, while leveraging Six Sigma* methods, AI, and other cutting-edge technologies.

*Six Sigma: Quality control method developed by Motorola in the 1980s.

Employee message

Shin-Etsu Chemical Wins Chairman's Award in Industrial Category at COGENERATION AWARD 2023

Project members (T.M. is on the far right in the photo) with the award certificate and plaque.

Mr. T.M. Matsuida Plant, Silicone Production Dept. 1, Gunma Complex, Shin-Etsu Chemical Co., Ltd.

Shin-Etsu Chemical's plants have installed cogeneration systems that use natural gas to produce steam and electricity to support the operation of manufacturing facilities. The cogeneration systems at the Isobe and Matsuida Plants of the Gunma Complex received the Chairman's Award in the Industrial Category, the highest award, at the COGENERATION AWARD 2023 organized by the Advanced Cogeneration and Energy Utilization Center JAPAN.

In building this system, I was involved in the construction of a culvert (an underground man-made channel) connecting the Isobe and Matsuida Plants.

Cogeneration systems are equipment that can greatly contribute to energy savings, reducing CO_2 emissions, and lowering the cost of energy purchases. The award-winning system optimizes the balance between supply and demand of steam and electricity by connecting the Isobe and Matsuida Plants, which have different demand ratios for steam and electricity, via a culvert, and transferring the steam between the two plants. As a result, we expect the Isobe and Matsuida Plants to become 100% self-sufficient in terms of power, which will help to further reduce energy and production costs. Furthermore, we expect to reduce CO_2 emissions by approximately 24,000 tons per year. Going forward, all of us involved will continue to work together to ensure a stable supply and improve efficiency of utilities.

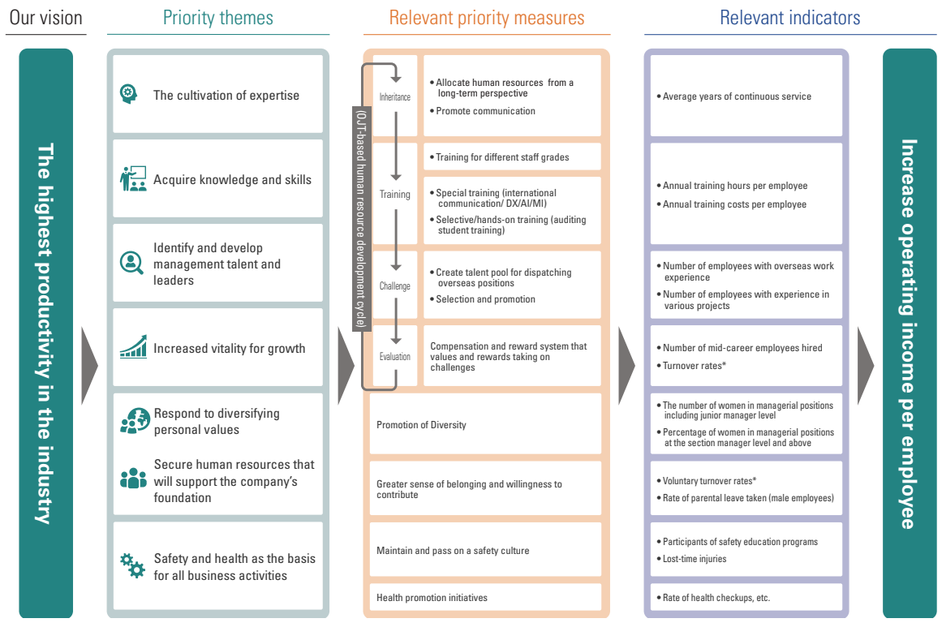
For more information, please visit our sustainability page.
https://www.shinetsu.co.jp/en/sustainability/esg_environment/management/site01/

Human Capital

Developing optimal staffing with T-shaped skill human resources in pursuit of a more efficient, smarter, and leaner way of working

The Shin-Etsu Group, believing that human resources provide the basis for all business activities, is working to strengthen human capital with "respect for human rights, the development of human resources and promotion of diversity" and "health and safety of employees and contractors" as key issues.

Highest productivity group in the industry



Note: For relevant indicators marked with*, the results for FY2023 are posted on the Sustainability site. The average years of continuous service is 20.1 years (Shin-Etsu Chemical), training hours per employee is 9.7 hours/year, training cost per employee is ¥35,000/year (both figures are for Shin-Etsu Chemical and its seconded employees), and the rate of parental leave taken (male employees) is 87.5% (Shin-Etsu Chemical). In addition, the percentage of women in managerial positions at the section manager level and above, and the number of participants of safety education programs are listed on pages 28 and 29, respectively, and the number of lost time injuries is listed on page 73.

https://www.shinetsu.co.jp/en/sustainability/esg_esg/

The Shin-Etsu Group's vision for human capital is to be a group capable of maintaining and improving the highest productivity in the industry over the long term, and we identify issues from a variety of perspectives and set priority themes with this in mind. By taking measures related to these priority themes while responding to changes in the labor market environment and the diversification of individual values, we intend to improve operating income per employee, which we have set as our most important indicator.

Through these efforts, we are developing human resources with "T-shaped" skills who can handle a wide range of tasks while possessing specialized skills. We have also strengthened crucial communication skills and customer service capabilities in order to get the most out of our tripartite teamwork manufacturing of sales, development, and production, which we know gives us an advantage. As a result, the growth rate of operating income in recent years has greatly exceeded the growth rate of the number of employees, and the productivity per employee has also increased significantly. Going forward, in addition to ensuring the transfer of skills and knowledge, identifying and developing the next generation of leaders, promoting work style reform and diversity in response to changes in the labor market and individual values, and improving employee engagement, we will also focus on securing and cultivating DX personnel essential for improving business and development efficiency.

Key Issues

Respect for human rights, the development of human resources, and the promotion of diversity

Respect for human rights

The Shin-Etsu Group complies with international codes of conduct and permanently respects human rights at all its business sites around the world. The Shin-Etsu Group Human Rights Policy stipulates the prohibition of discrimination, the prohibition of damaging human dignity, the protection of privacy, the respect for basic labor rights, and the prohibition of child labor and forced labor. In order to thoroughly enforce these policies, the Human Rights Due Diligence* Subcommittee, established within the Sustainability Committee, establishes a system for investigating human rights risks and consulting and reporting on human rights and promotes human rights awareness and education in cooperation with the Shin-Etsu Chemical's Human Rights Enlightenment Promotion Committee. (See page 33.)

*Human rights due diligence: What companies should do to recognize, prevent and address adverse human rights-related impacts, including developing human rights policies, assessing the impact of corporate activities on human rights, and tracking and disclosing performance.

Developing optimal staffing with T-shaped skill human resources

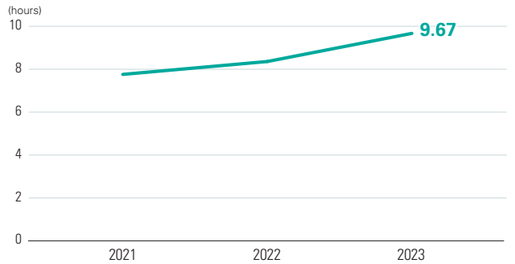
One of the major factors supporting the Group's high productivity is the development of human resources with "T-shaped" skills who can perform a wide range of tasks while possessing deep expertise in their respective departments and fields. As each individual continues to pursue more efficient and leaner ways of working, they acquire highly practical and specialized knowledge and build wide-ranging cooperative relationships in carrying out their work. Utilizing the T-shaped skill human resources developed in this way will allow the Company to thrive even in harsh environments through a strategy of maximizing economies of scale during periods of strong demand while handling a wide range of tasks with its existing workforce during periods of low demand.

We also emphasize OJT (On the Job Training), which develops human resources through work, and have enhanced our training programs tailored to the employee's level of skill development. To increase the effectiveness of site-driven OJT, instead of one-size-fits-all personnel transfers, our basic policy is to place the right person in the right position under a long-term approach, taking into account each employee's training situation and career aspirations. At the same time, we are also working to improve employee engagement by supporting diverse work styles that can accommodate life events and other situations.

Performance-based personnel evaluation system

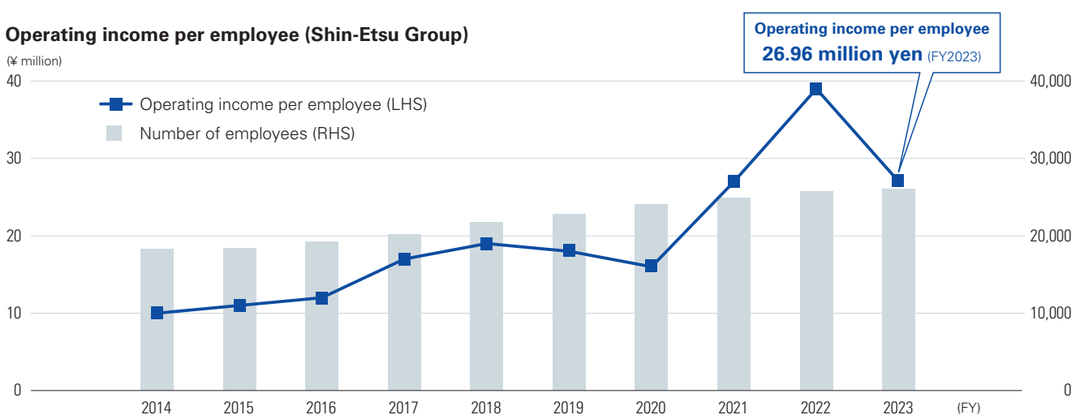
To increase employees' motivation, the Group evaluates how they meet their challenges to achieve higher goals and compensates them in a way that reflects their achievements and approaches. To operate the personnel system in a fair and appropriate manner, we conduct evaluation training for all managers in charge of personnel evaluation to ensure their evaluations are fair and reasonable. In addition, the Company has made its evaluation criteria known to employees to enhance transparency, and has established a system of interviews between supervisors and subordinates to facilitate communication between the two. During the interviews, a "communication sheet" is used to mutually confirm issues, set half-year goals, and provide feedback on the results to promote further skill development.

Training hours per employee (Shin-Etsu Chemical)



Scope: Employees and seconded employees of Shin-Etsu Chemical
Note: The auditing student system was resumed in FY2023 and is therefore included in the training hours.

Operating income per employee (Shin-Etsu Group)



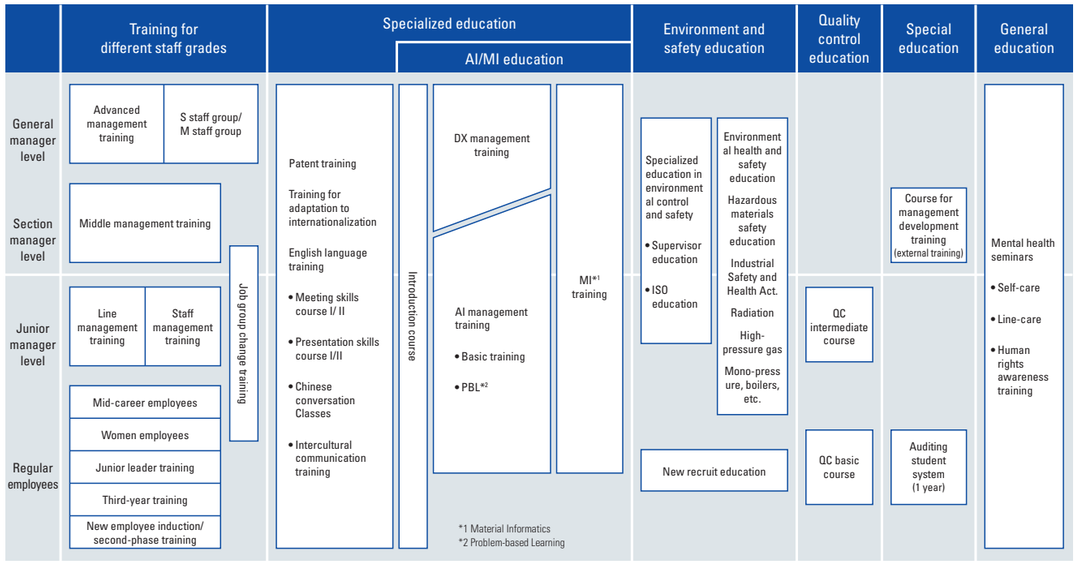
Human Capital

Human resource development system

Recognizing that employee growth leads to company growth, the Shin-Etsu Group supports employee growth through a variety of training programs, including training for each staff level, global communication training, AI management training, an auditing student system, environmental education, safety education, and mental health education.

For example, as a group engaged in business activities on a global scale, we focus on global communication training to improve communication skills in foreign languages to ensure smooth business operations around the world. Furthermore, to discover and develop human resources capable of using AI and to improve the overall level of AI in the Company, in FY2021 we started offering a full range of AI management training programs from basic literacy to data analysis and project management. In addition to this kind of systematic training, the Group also places great importance on individualized training. On the operational front lines in particular, we believe that true growth is achieved through the accumulation of daily experience. We therefore emphasize OJT, aiming to develop human resources who can demonstrate flexible creativity and initiative.

Training system list



Sense of belonging and willingness to contribute

In 2022, we conducted an employee awareness survey on a range of items including: compliance, customer orientation, penetration of management philosophy, Company's future prospects, personnel system, career outlook, workload, work environment, and relationships with superiors. The response rate was 86.5%. One survey finding in particular was that the Company's policy of emphasizing compliance had spread widely among employees. We aim to use these survey results to continue to develop the good points and improve the areas that need improvement, while further enhancing employees' sense of belonging and willingness to contribute so that more of them can enjoy a rewarding work experience.

Promotion of diversity

Japan has a declining birthrate and an aging population, and the working-age population is decreasing year by year. In order to sustain corporate activities, it has become essential to utilize a diverse workforce, regardless of age or gender. The Group also employs people of a wide range of nationalities and backgrounds, which is essential from the perspective of expansion of global business domains, diversification of business operations, and innovation in digital technology. The Group places the highest priority on respect for the individual and aims to create a workplace where diverse human resources, regardless of gender, nationality, disability, or age, can contribute to the best of their abilities.

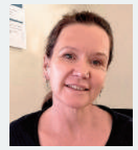
Employee Interviews

Shin-Etsu Challengers

The Shin-Etsu Group employs approximately 26,000 people at all of its sites around the world. The Shin-Etsu Chemical Sustainability site features "Shin-Etsu Challengers," a series of employee interviews with a diverse range of Shin-Etsu Group employees talking about the challenges they are taking on in their work. Here are some snippets from the employee interviews posted on the site.

Shin-Etsu Chemical Sustainability site "Shin-Etsu Challengers"
https://www.shinetsu.co.jp/en/sustainability/esg_employ/education/interview

I hope to create win-win solutions with customers



Ms. A.H.
Smelter Superintendent, Simcoa Operations

I started at Simcoa as a manufacturing process data analyst, and now serve as Smelter Superintendent, managing safe operations, production targets, product quality, and maintenance to maximize uptime. When I first joined the company, I was the only woman in the department I was assigned to, but now women are active in a range of key positions, including the head of production planning. Despite the large number of male employees, I have been able to use my unique empathetic and constructive approach to problem solving with positive results. I am now taking on the challenge of getting to know our customers in depth to create win-win solutions.

I wish to contribute not only to export control but also to production planning

Ms. K.T.
Shin-Etsu Silicones (Thailand)

I was in charge of silicone export control in my previous job, and I joined Shin-Etsu Silicones because I felt I had further to grow. I'm now familiar with customs clearance rules and free trade agreements, and I'm able to make proposals that benefit our customers. In addition, by learning more about the demand trends in the markets we ship to and the nature of our customers' business, we will be able to further improve the accuracy of our production plans at the Thai plant and create an optimal shipping balance. I hope not only to manage shipments, but also to support sales activities to appropriately increase shipment volume.

I would like to turn diversity into a Group-wide strength

Ms. C.S.
Shin-Etsu Silicones Europe B.V.

I am Head of Sales for industrial silicone fluids in EMEA and I am also developing specialty markets. I have not only Japanese but also German, Spanish, Italian, Hungarian, and Malaysian colleagues. By utilizing diverse perspectives and experiences, we can take a more global approach. To turn diversity into value, cooperation among overseas subsidiaries is also important. I would like to be a leader to spread the benefits of diversity throughout the Shin-Etsu Group.

I want to use DX to achieve Company-wide transformation

Mr. K.M.
Shin-Etsu Skyward Systems

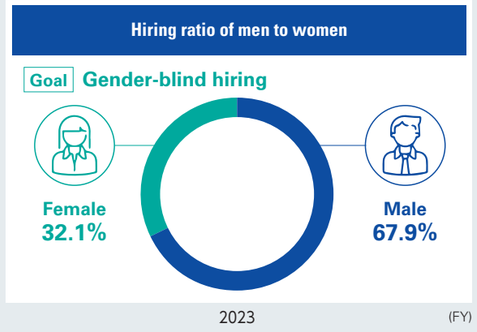
In the process of driving digital transformation (DX), I have implemented more than 200 operational efficiencies. DX is not just about tools and systems; it is also about developing human resources who can make appropriate use of AI and data. I would like to help our employees use data and systems to bring about some kind of change, even if it is something small. I believe that if we can provide a learning opportunity for employees who haven't had the opportunity to deeply engage with AI and change their mindset about handling data even a little, we will be laying the foundation for company-wide transformation.

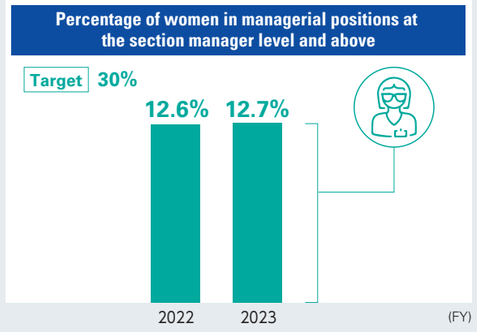
Human Capital

Promoting the active participation of diverse human resources

The Group is working to promote the active participation of women and create a workplace environment where employees of all walks of life can work to their full potential. So that we can expand our business globally, we are focused on local recruitment overseas as well as the hiring of foreign nationals living in Japan.

In FY2023, the ratio of female employees was 29%, the ratio of hiring women was 32.1%, and percentage of women in managerial positions at the section manager level and above was 12.7% (the figures refer to Shin-Etsu Chemical and consolidated companies).





Scope: Shin-Etsu Chemical and consolidated companies

Work-life balance

The Shin-Etsu Group always places the highest priority on ensuring the stable employment of its employees. The Company grows when its employees feel secure in their jobs, do good work, and achieve good results. Based on this thinking, we are working to improve the working environment and enhance support systems so that employees can balance work and family life without leaving their jobs due to life events such as childbirth, childcare, and nursing care.

Proper management of working hours

The Group aims to raise awareness about managing working hours, eliminate excessive working hours, and create highly productive workplaces across the Company. To this end, we are proactively introducing a system to accurately track working hours through PC logs and other sources. In addition, we are promoting the development of systems and working environments that enable flexible and highly productive work styles, such as the flextime system and telecommuting.

Career support

Starting in 2023, we expanded the Shinkansen commuting allowance system, which allows employees to commute long distances by bullet train at company expense, so that couples can continue their careers without living separately or quitting their jobs. We also introduced a system that allows employees to take a leave of absence for up to three years to accompany their spouse on an overseas assignment, and a retiree registration system (return employment system) that allows employees to be rehired for up to 10 years after separation from the Company.

Topic

Holding the first roundtable for female employees

In March 2024, Shin-Etsu Chemical held its first roundtable for female employees at its head office as part of its efforts to promote the active participation and advancement of women. Ms. Hasegawa (Outside Director), Ms. Kagami and Ms. Kaneko (Outside Audit & Supervisory Board Members) participated in the meeting as mentors, and 19 female Group employees attended in total.

At the beginning of the meeting, President Saitoh offered remarks on the active participation of women. "In Japan, we tend to talk about quantity, such as the need to hire and promote women in order to secure workers in the face of our declining birthrate. However, I am more interested in quality. I think the quality of your perspectives and ideas is more important than quantitative numbers," he said. The three mentors shared their experiences and talked about their expectations for the Group, and the participants actively exchanged opinions about their workplaces and jobs, providing an opportunity for female employees to connect with each other across divisions. We received some feedback from the participants after the meeting, including the comment "It was good that we were able to not only talk about our concerns, but also think about what needs to be done to address them."

President Saitoh (far right) expressing his thoughts, and the mentors (from left) Ms. Kaneko and Ms. Kagami (Outside Audit & Supervisory Board Members) and Ms. Hasegawa (Outside Director)

Female employees participating in the roundtable

Key Issues

Health and safety of employees and contractors

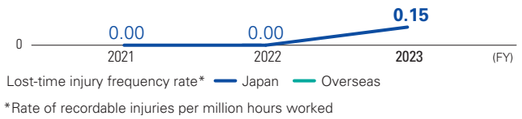
Creating safe and secure workplaces

In aiming to prevent all serious and lost-time accidents, the Group conducts risk assessments to comprehensively identify risks that could lead to injury or illness and is working to create safe and comfortable workplaces by eliminating or minimizing risks.

Participants of safety education programs (Total number of persons)

(FY)	2019	2020	2021	2022	2023
Shin-Etsu Chemical	19,411	32,527	39,348	59,343	70,952
Consolidated companies	39,328	46,998	56,236	75,406	87,349

Changes in lost-time injury frequency rate

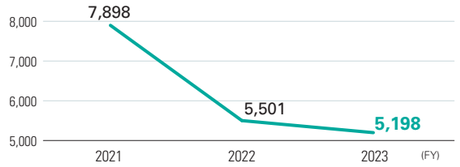


*Rate of recordable injuries per million hours worked

Accident prevention initiatives

As a bottom-up initiative implemented at each worksite, the Group accepts suggestions from and listens to the concerns of workers who have experienced close-call incidents themselves and employs measures to address even the slightest of concerns. At the same time, by sharing the information within and outside of the Group, we strive to roll out safety measures as well as preventive measures for similar incidents.

Suggestions regarding close-call incidents or other concerns



Please visit the following website page for the suggestions disclosed thus far.
https://www.shinetsu.co.jp/en/sustainability/esg_safety/

Physical and mental health of employees

In addition to encouraging regular health checkup s, we actively provide health guidance on lifestyle-related diseases, take mental health measures, and hold events to improve physical fitness so that our employees can work at peak health and energy. We've also prepared countermeasure manuals against important infectious diseases including COVID-19 so we can prevent their spread.

We've set up health committees at the head office and branch offices, as well as safety and health committees at each plant site. These committees get information and guidance from industrial physicians and are working to improve the work environment and promote health. Furthermore, we offer an outside Family Health Consultation Service with our health insurance union and an affiliated insurance company. It is available 24 hours a day and can also be used by the family members of employees.

Intellectual Capital

Promoting rapid, field-linked R&D and strategic IP management to protect our business

Viewing R&D as a "challenge" to pioneer the future, the Shin-Etsu Group is pursuing R&D to meet the needs of the times. We also regard the results of our R&D as important assets and strategically manage the valuable intellectual property obtained through R&D to make effective use of it.

The "tripartite teamwork" for rapid response to customer needs

The Shin-Etsu Group's R&D department rapidly develops products tailored to customer needs while keeping an eye on mass production after product development. This is made possible by our unique R&D system that integrates sales, development, and production into a tripartite teamwork manufacturing system, with an R&D center located on the production sites. We also promote R&D projects under the direct control of the President in order to meet customer needs and generate new solution ideas. At the same time, we are focusing on recruiting and developing human resources who are familiar with digital technology such as AI and are working to improve development efficiency and shorten development time by utilizing materials informatics.

Aggressive product development in new areas with growth potential

Shin-Etsu Chemical leads the PVC industry in the development of polymerization technology using its proprietary large-scale polymerization reactor and non-scale technology. We are also advancing crystal growth and processing technologies in silicon wafers and solidifying our competitive advantage through R&D that is one step ahead of the competition.

Furthermore, in terms of new business areas, we are focusing our R&D efforts on five major priority areas in growth markets where we can leverage our strengths: energy, semiconductor-related materials, high-speed communications at 5G and beyond, healthcare, and materials that contribute to achieving SDGs and carbon neutrality. The following are some of the research themes we have been focusing on in FY2023 and beyond.

(1) Development of vertical GaN devices (see Topic)
Since 2021, we have pursued ongoing sample evaluation and device development in the application areas of power devices, RF devices and LEDs with numerous customers in Japan and globally. With regard to power devices in particular, we are pursuing continuous evaluation for the commercialization of devices across a wide range of voltages.

(2) Development of the KRW-6000 series, a water-based, fast-curing silicone resin that does not use emulsifiers
In the field of functional materials, we developed the KRW-6000 series, the industry's first* water-based, fast-curing silicone resin that does not use emulsifiers. Compared to organic solvent-based silicone resins, water-based products to which emulsifiers are added tend to have inferior film properties and require more time for drying and curing. The new product solves these problems, has excellent film properties, and can be cured quickly through heating.

Silicone resin has excellent water resistance and is expected to be applied to binders used as undercoat paints.

*According to our research (as of the end of February 2024)

(3) Dry adhesive technology that utilizes biomimicry
In April 2024, Shin-Etsu Chemical agreed to acquire a dry adhesive technology that utilizes biomimicry developed by Setex Technologies, Inc. and develop new markets for the technology. Setex has developed a technology for providing materials with strong friction and adhesion by building a structure resembling a gecko's hand on the surface of the material. Shin-Etsu Chemical will endeavor to apply the technology to various products used in semiconductor processes and other manufacturing processes, and will propose new technologies under the brand name ShineGrip™ for applications that require repeated friction and adhesion on material surfaces.

Topic

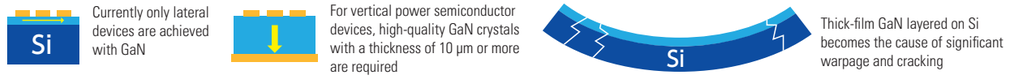
Advancing our QST™*1 substrate business for true practical application of GaN power devices

Shin-Etsu Chemical has determined that QST™ (Qromis Substrate Technology) substrate*2 is an essential material for the practical implementation of GaN (gallium nitride) power devices, and the Company will promote the development and launching on the market of these products. Since QST™ substrate is designed to have the same coefficient of thermal expansion (CTE) as GaN, it suppresses warpage and cracking of the GaN epitaxial layer and enables large-diameter, high-quality thick GaN epitaxial growth. Taking advantage of these characteristics, it is expected to be applied to power devices and RF devices for 5G and beyond 5G, which have been rapidly growing in recent years, as well as in such areas as MicroLED growth substrates for MicroLED displays.

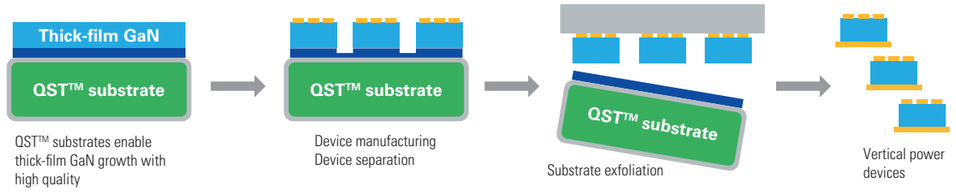
As a result of numerous improvements to our QST™ substrates, we have achieved stable epitaxial growth of more than 10 μm in thickness. Moreover, Shin-Etsu Chemical and Oki Electric Industry Co., Ltd. have jointly succeeded in developing a technology to peel off GaN from QST™ substrates and bond it to substrates made of different materials using Crystal Film Bonding (CFB)*3 technology. To customers who manufacture GaN devices, Shin-Etsu Chemical will provide QST™ substrates or GaN epitaxial substrates and Oki Electric Industry will provide its CFB technology through partnering or licensing. In this way, the two companies aim to popularize vertical devices, which can control larger currents than the currently mainstream lateral GaN power devices.

*1 QST is a registered trademark held by Qromis, Inc. in the United States (registration number 5277631).
*2 A QST™ substrate is a composite material substrate developed by Qromis, Inc. exclusively for GaN growth and was licensed to Shin-Etsu Chemical in 2019.
*3 CFB technology is a technology to peel off GaN epitaxial layers from substrates and is a registered trademark of Oki Electric Industry.

Challenges with Si substrates currently used for GaN devices



Approach to the realization of vertical GaN devices with QST™ substrates



Clarivate Top 100 Global Innovator™ One of only two chemical manufacturers in the world to have won the award for 13 consecutive years

The Shin-Etsu Group protects its IP gained through R&D from infringement by third parties by securing intellectual property rights both in Japan and overseas. At the same time, we search patent publications related to existing and new businesses to avoid infringement of rights. We also strategically manage our intellectual assets by, for example, keeping information that should not be disclosed as confidential knowledge. At present, there are no cases where business operations are hindered by IP.

In addition, we encourage researchers to conduct research with patent rights and other IP rights in mind, and educate them so that they can prepare documents for rights acquisition. We also have a system in place to reward and recognize personnel who have made significant contributions to the Company in the form of patents and other inventions and ideas. As a result of these and other efforts, Clarivate, a global information services company, has recognized Shin-Etsu Chemical as a Clarivate Top 100 Global Innovator™ for 13 consecutive years. The award recognizes companies and institutions that protect original invention ideas with IP rights and successfully commercialize them. We are one of only two companies in the chemical field to have received the award for 13 consecutive years.

Intellectual Capital

Message from an employee of the R&D Department

Using AI and computational science to accelerate and deepen R&D

Mr. N.Y.
R&D Department
Shin-Etsu Chemical Co., Ltd.

Using generative AI in materials exploration to speed up development to meet customer needs

The Group is actively utilizing AI and computer simulation, which continue to evolve day by day, in its R&D activities. This allows us to accelerate product development to meet customer needs while also deepening research aimed at creating new value.

In traditional R&D, the researcher relies on experience and intuition to design a substance that is likely to meet the required properties based on the scientific literature and existing experimental data, and then discovers the material through repeated experiments. This makes R&D dependent on the individual researcher and limits the number of material candidates that can be considered. Materials exploration requires efficiently finding materials with superior characteristics from the vast chemical structure space of substance. To do this, it is essential to generate a large number of candidate molecular structures, and then 1) perform screening calculations based on deep learning AI or simulations to filter and narrow down the results, and 2) perform automatic autonomous computing using Bayesian optimization*1, genetic algorithms*2, or generative AI. We are conducting research with the goal of utilizing such powerful exploration methods to propose optimal materials extremely efficiently in a short period of time.

*1 Bayesian optimization: A method for quickly arriving at an optimal solution by sampling in order of the higher probability of obtaining the optimal solution.

*2 Genetic algorithm: A method for searching for approximate solutions that mimics the mechanism of biological evolution.

Achieving high-precision MI to create new added value

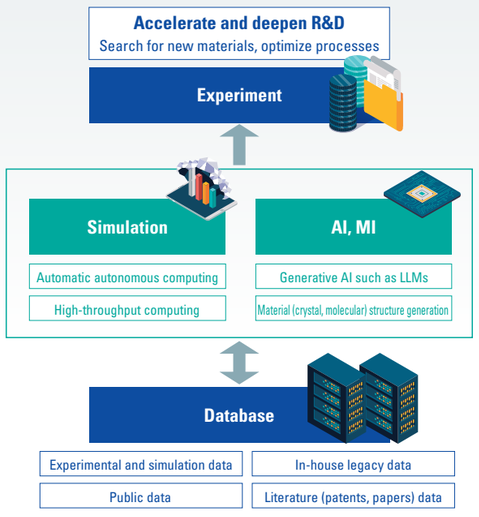
We are also focusing on developing human resources to take responsibility for AI and MI*3 technologies at our R&D sites. In addition to providing MI training using learning materials specific to our in-house research projects, we are supporting the application of MI to real-world issues at our development sites, and this approach has led to successes such as the launch of new products.

Deploying MI in this way requires highly reproducible experimental and simulation data. We aim to realize more accurate MI by extracting data from existing in-house data using generative AI, building a database that integrates various experimental data, and utilizing public data from academia and other institutions.

By utilizing these MI technologies in the development of materials such as resist materials and silicone materials, we will endeavor to shorten development times and provide customers with quicker solutions, ultimately leading to the creation of new added value.

*3 Materials informatics (MI): An effort to use informatics methods in the development of materials.

Scheme for the use of AI and simulation in R&D



Social and Relationship Capital

Our commitment to respecting human rights and building strong relationships of trust with customers

We are strongly committed to respecting human rights, not only within the Shin-Etsu Group, but across the entire supply chain, to guarantee the stable supply of high-quality products to our customers. In the electronics materials business, we have built a strong relationship of trust with our customers, as evidenced by their praise of our quality and supply systems and the supplier awards we have received.

Respect for human rights

In addition to complying with the laws and regulations applicable in the countries and regions where it does business, the Group learns from international codes of conduct*1 and promotes efforts to ensure perpetual respect for human rights.

In May 2019 we formulated the Shin-Etsu Group Human Rights Policy. In order to confirm the status of compliance with our Human Rights Policy, we conduct an annual survey of our consolidated companies regarding items related to respecting human rights*2, labor management, and whether employment is properly implemented in accordance with the laws and regulations of each country and region. Furthermore, we consider human rights impacts on local communities when building new plants. In May 2024, in light of changes in the social environment surrounding human rights, we revised our Human Rights Policy based on the UN Guiding Principles on Business and Human Rights, and the revised policy was approved at the Managing Directors' Meeting attended by all directors, audit & supervisory board members and corporate officers.

*1 Examples of international codes of conduct include the Universal Declaration of Human Rights, the ILO International Labor Standards, the United Nations' Guiding Principles on Business and Human Rights, and the United Nations Global Compact's "Ten Principles."

*2 Items related to respecting human rights: the prohibition of forced labor and child labor; appropriate working hours and fair wages; fair employment contracts in written form; prohibition of inhumane treatment and discrimination; and freedom of association and the right to collective bargaining.

FY2023 initiatives on human rights risk

In FY2023, we introduced a system to accurately track working hours through PC logs and worked to establish working environments that enable flexible and highly productive work styles, such as the flextime system and telecommuting. We also supported the efforts of Group companies in Japan to reduce overtime work.

Meanwhile, starting in 2022, we sent the "Shin-Etsu Group Human Rights Policy," "Basic Procurement Policy," and "CSR Procurement Guidelines" to our major business partners, and asked approximately 70% of our first-tier suppliers for cooperation in responding to a questionnaire regarding sustainability initiatives, including human rights. As a result, we were able to confirm that no serious violations of human rights had occurred.

Human rights awareness training

In FY2023 we organized 46 training sessions on the topic of respecting human rights, which were attended by 1,125 employees overall. In the training, basic knowledge and countermeasures regarding power harassment, sexual harassment, LGBTQ, etc. were explained, and efforts were made to raise employee awareness of human rights.

Shin-Etsu Chemical recognized as an excellent supplier by three manufacturers for its high quality and supply system

In FY2023, Shin-Etsu Chemical was recognized as an excellent supplier by three of the world's leading semiconductor manufacturers. Samsung Electronics presented us with the "Best in Value Award," an award given to suppliers who provide the best value to Samsung. In addition, Micron Technology expressed their appreciation and expectations for the future, stating "Shin-Etsu Chemical never gives up and has been steadfast in responding to our needs. We look forward to your continued strong support." Finally, TSMC recognized the excellent performance, high quality, and rapid supply of our photoresists and photomask blanks.

President Saito receiving the trophy from then-CEO Kyung of Samsung Electronics

Natural Capital

In addition to our commitment to carbon neutrality by 2050, we are focusing on conservation of water resources, biodiversity, and waste reduction

Key Issues

Energy-saving, resource-saving, and reduction of the environmental impacts

The Shin-Etsu Group's efforts to contribute to the value of natural capital focus on addressing climate change; resource saving through waste reduction and resource recycling, etc; conserving water resources and biodiversity; and measures against pollutants, starting with reducing chemical emissions. In particular, in response to climate change, in May 2019, we announced our support for the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Furthermore, at the end of May 2023, we planned to becoming carbon neutral by 2050 and formulated a plan to reduce greenhouse gas emissions (Scope 1 and 2) to net zero. Meanwhile, we will continue to focus on developing and expanding sales of our own products that contribute to the reduction of greenhouse gas emissions.

Disclosure under the TCFD

Governance

The Sustainability Committee is working with each of the Group's business units to address climate change. The Sustainability Committee is one of the committees for each material management task in the Group's corporate governance system. The Committee is chaired by the President and consists of approximately 60 members, including our directors, corporate officers, department managers, and sustainability officers from Group companies, and promotes activities that integrate business activities and sustainability initiatives.

In FY2021, we established a Carbon Neutral Task Force within the Committee to examine each issue related to climate change. The Task Force regularly reports the latest information to the President, who uses this report to determine policies for achieving carbon neutrality. In FY2022, the Task Force reported on climate change-related initiatives at meetings of the Managing Directors' Meeting and the Board of Directors attended by all Directors, Audit & Supervisory Board members and Corporate Officers. In FY2023, the Task Force formulated a specific plan for achieving carbon neutrality by 2050, which was discussed and unanimously approved at the Managing Directors' Meeting.

Strategy

The Group considers the promotion of plans to achieve carbon neutrality by 2050 as an important management issue, and is therefore promoting information disclosure based on the TCFD recommendations, including scenario analysis. At the same time, through this analysis, we identify important risks and opportunities that affect our business through these analyses, and reflect them in our management.

Risk management

The Risk Management Committee works to prepare for and eliminate the various risks surrounding our business, including risks posed by climate change. The Committee is chaired by a managing corporate officer and consists of approximately 20 members, including our directors, corporate officers, and department managers.

Our Group has established Risk Management Regulations to identify potential risks associated with our business activities and address these risks appropriately. The Risk Management Regulations clearly state specific risks, risk management systems, and responses to risks that materialize. The Risk Management Committee reports to the Board of Directors, Managing Directors' Meeting, Audit & Supervisory Board, and relevant parties in a timely manner on important risk management issues, and works to address them appropriately. With regard to the risks related to climate change, which have become increasingly important in recent years, the Sustainability Committee works with the Risk Management Committee to ascertain risks through scenario analysis.

Climate-related physical risks include increased spending due to CO_2 emissions trading and carbon taxes, transition risks such as rising manufacturing costs due to rising energy prices, damage to equipment due to the wind disaster, and damage to electrical equipment due to flooding, or plant shutdown resulting from such cases. Among these risks, we defined serious risks such as accidents, explosions, fires, and other major disasters that cause operations to be stopped for one day or more, and environmental pollution incidents that exceed legal standards values or regulation values.

Scenario analysis of our business in 2050

Business Opportunities Stemming from Climate Change: A scenario for a 1.5°C rise

Application	Details	Revenue Impact
PVC-framed windows	Polyvinyl chloride resin is used for resin windows because of its excellent heat insulation properties. Demand for resin windows is expected to increase along with the spread of energy-saving homes.	Large
Electric, hybrid, and fuel-cell vehicles	Semiconductor silicon is used in power semiconductor devices such as inverters to control the number of rotations of motors, logic semiconductor devices for automatic driving system and AI. High-performance and compact rare earth magnets can reduce the overall weight of a vehicle and improve its fuel efficiency, which will expand their use in the drive motors of electric, hybrid, and fuel cell vehicles, as well as in a variety of other motors in vehicles. Silicone heat-dissipating materials are used in lithium-ion batteries and various electronic control devices. Demand is expected to grow as it helps prevent malfunctions and failures caused by heat.	Large
Wind power generators	Demand for rare earth magnets is expected to grow as they contribute to higher efficiency in offshore wind turbines and lower maintenance costs for generators. Demand for vinyl chloride used for wire sheathing is also expected to increase due to the development and expansion of the power grid.	Large
Air conditioners	Demand for semiconductor silicon is expanding as it is used in inverter control devices for compressor motors and contributes to power saving by adjusting the rotation speed of the motor to an appropriate level. Demand for rare earth magnets is expected to grow as they improve the energy efficiency of air conditioner compressor motors and reduce energy consumption.	Medium
Aircraft	Rare earth magnets are indispensable for the electrification and hybridization of small aircraft and for the electrification of hydraulic drive units in large aircraft. Demand for rare earth magnets is expected to increase as their small size and high power will help reduce the weight of the aircraft and improve fuel efficiency.	Medium
Industrial motors	Demand for rare earth magnets is expected to grow as they increase the efficiency of industrial motors and reduce the amount of electricity consumed.	Medium
Service robots	Semiconductor silicon is increasingly being used in semiconductors for energy-saving robot control motors for manufacturing, logistics, agriculture, and other applications, as well as in medical and disaster response robots.	Medium
Binding agent for plant-based meat substitutes	A diet centered on plant-based foods may reduce CO_2 emissions by 1.6 gigatons per year*. Cellulose derivatives are used as a binding agent for plant-based meat substitutes. The global market for plant-based meat is expected to grow at a double-digit rate annually, and further market expansion is expected.	Medium

*Source: "DRAWDOWN–The Most Comprehensive Plan Ever Proposed to Reverse Global Warming," written and edited by Paul Hawken.

Business risks due to climate change and countermeasures: A scenario for a 1.5°C rise (transition risk)

Events	Risks to the Company	Revenue Impact	Countermeasures
Introduction of carbon taxes and establishment of carbon emission quotas around the world	• Payment of carbon tax • Incurring costs of purchasing emission credits to meet carbon emission quotas • Increase in cost of measures to reduce greenhouse gas emissions	Large	• Reduce scope 1 emissions (e.g., further promotion of more efficient production processes and introduction of highly efficient equipment; use of energy sources that do not emit CO_2, such as hydrogen and ammonia; use of CCUS) • Achievement of reduction targets in the absolute amount of greenhouse gas emissions • Collection of information on environmental regulations such as carbon taxes in each country and implementation of countermeasures
Widespread use of electricity derived from renewable energy sources and rising electricity prices resulting from tightening regulations on greenhouse gas emissions	• Increase in electricity costs	Large	• Reduce Scope 2 emissions (further promotion of production processes that use less electricity, introduction of high-efficiency equipment, etc.)

Business risks due to climate change and countermeasures: A scenario for a 4°C rise (physical risk)

Events	Risks to the Company	Revenue Impact	Countermeasures
Increase in the frequency of extreme weather events Increased frequency of flooding caused by changes in precipitation patterns, etc.	• Flooding of production sites • Disruption of the supply chain	Large	• Raising the ground level of production sites, installation of watertight walls around critical facilities • Installation of instrument rooms in areas with low risk of flooding • Installation of seawalls at production sites close to ports • Multiple production sites • Diversification of raw material procurement sources • Securing product inventory • Enrollment in insurance
Introduction of carbon taxes and establishment of carbon emission quotas in some countries		Small	• Reduce scope 1 emissions (e.g., further promotion of more efficient production processes and introduction of highly efficient equipment; use of energy sources that do not emit CO_2, such as hydrogen and ammonia; use of CCUS) • Achievement of reduction targets in the absolute amount of greenhouse gas emissions • Collection of information on environmental regulations such as carbon taxes in each country and implementation of countermeasures
Electricity prices	According to a scenario analysis by IEA* (a scenario with current measures), electricity prices will not rise. Therefore, there is no risk to us.	—	—

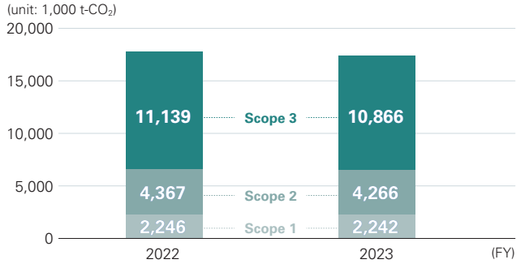
*International Energy Agency

Natural Capital

Metrics and targets

The Shin-Etsu Group has formulated a long-term plan to reduce greenhouse gas emissions (Scope 1 and Scope 2) to net zero, with the aim of achieving carbon neutrality by 2050. In FY2023, Scope 1 emissions were 2,242 thousand t-CO_2 (down 4 thousand tons or 0.2% from the previous fiscal year) and Scope 2 emissions were 4,266 thousand t-CO_2 (down 102 thousand tons or 2.3% from the previous fiscal year). Meanwhile, the Group has also set a target of reducing greenhouse gas emissions in terms of production intensity to 45% (i.e. down 55%) of the FY1990 level by FY2025. FY2023 results were 57.0% (up 2.8 points year on year) compared to FY1990 for the Group and 53.4% (up 6.6 points year on year) compared to FY1990 for the Company. In FY2023, we continued to promote energy-saving activities at each of our business sites. On the other hand, although production volume decreased in FY2023, the energy consumption per unit of production increased due to the impact of fixed energy consumption (such as clean rooms, air conditioning, and lighting) that does not decrease proportionally with production volume.

Greenhouse gas emissions by scope



(Note) Scope 1 for FY2023 includes the emissions related to the emission categories added by the revision of Japan's Order for Enforcement of the Act on Promotion of Global Warming Countermeasures, which came into effect on April 1, 2024.

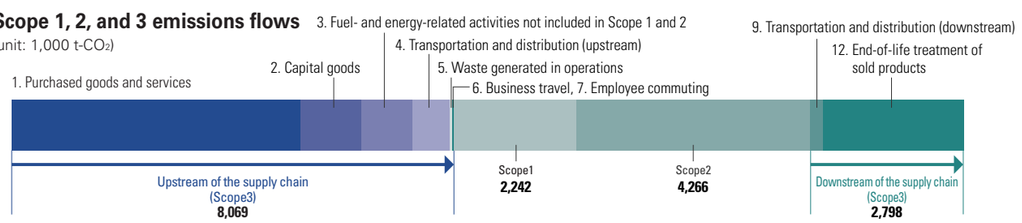
Reference Scope 3 Greenhouse Gas Emissions

The Group's Scope 3 greenhouse gas emissions*1 for FY2023 were 10,866 thousand t-CO_2 (down 272 thousand tons or 2.4% from the previous fiscal year), amounting to 63% of the supply chain*2's total emissions.

*1 Scope 3: Emissions from the supply chain
*2 Supply chain: All stages of a product life from raw material production until the product is discarded.

Scope 1, 2, and 3 emissions flows

(unit: 1,000 t-CO_2)



For information on Scope 3 emissions by category and how we calculate them, visit the Sustainability website.
https://www.shinetsu.co.jp/en/sustainability/esg_environment/global_warming/

Initiatives Aimed at Carbon Neutrality

In order to achieve carbon neutrality by 2050, the Group aims to reduce greenhouse gas emissions in absolute terms (Scope 1 and Scope 2) in addition to the conventional reduction of greenhouse gas emissions in terms of intensity. The specific plans are as shown in the table below, "Plan for realizing carbon neutrality." In addition to introducing the latest energy-saving equipment and cogeneration systems, we are proceeding with initiatives such as installing solar power generation facilities, utilizing hydrogen and biomass fuels, building recycling systems, and considering CCUS*. Other initiatives to achieve a carbon neutral society are listed below in the sections labeled 1-3.

*CCUS: Carbon dioxide capture, utilization and storage

Plan for realizing carbon neutrality

1) Current reduction measures

Reduction measures	Details
(1) Power-related	Reduce CO_2 emission factor Purchase of renewable energy Installation of solar power generation equipment
(2) Improvement and innovation of manufacturing technologies, etc.	Improvement of heat recovery capacity Introduction of energy-efficient equipment Switching from boilers to heat pumps Expansion in order to increase the production of charcoal reducing agents
(3) Utilization of carbon-neutral natural gas (natural gas with emission credits), hydrogen, etc.	Co-firing in cogeneration systems
(4) Promotion of recycling	Further promotion of recycling of PVC products and rare earth contained in rare earth magnets that has already been implemented

2) Anticipated reduction measures for carbon neutrality by 2050

Reduction measures	Details
(1) Power-related	Carbon neutralization of electricity
(2) Utilization of green and blue hydrogen	Single fuel firing in cogeneration systems Use as boiler fuel
(3) Continued improvement of manufacturing technologies, etc.	Continuous thorough rationalization and efficiency improvement
(4) CO_2 separation and recovery, and utilization	Introduction of separation and recovery equipment, and recycling of CO_2
(5) Utilization of biomass fuel	Power and steam supply through introducing biomass cogeneration systems, etc.
(6) Promotion of recycling	Establishment of a recycling system for products other than PVC and rare earth magnets that have already been implemented
(7) Carbon offset	Examination of a wide range of carbon offsets, including those from tree planting

1) Initiatives to reduce greenhouse gas emissions across the supply chain

The Group is also working to reduce greenhouse gas emissions throughout its supply chain. Specifically, we investigate suppliers' plans to reduce greenhouse gas emissions and confirm the implementation of measures to reduce emissions. We also conduct surveys of greenhouse gas emissions related to the main raw materials supplied to us. At the same time, we are working to reduce emissions through joint development with our customers. For example, we worked with customers to develop product shipping cartons for heat-dissipating silicone grease that can be recycled many times while maintaining an optimal temperature without dry ice, thereby reducing CO_2 emissions. We also carry out life cycle assessments of products in the supply chain and will continue to do so in the future.

2) Reduction of greenhouse gas emissions in logistics

We are working to reduce greenhouse gas emissions during product transportation. This will contribute to the reduction of scope 3 greenhouse gas emissions.

Reduction in logistics

Examples	Scope 3 emissions categories contributing to reductions
Modal shift* in methanol transport (switched from tank truck to railcar)	Category 4: "Emissions from product transport"
Modal shift in silicon wafer transport (switched from aircraft to ocean vessel)	
Modal shift in silicone products transport (switched from truck to railcar)	

*Modal shift: Shifting from trucks and other freight transports to railways or ships with less environmental impact.

3) Expand manufacturing and sales of products that contribute to reducing greenhouse gas emissions

Many of the Group's products contribute to reducing greenhouse gas emissions, reducing environmental impact, and achieving a sustainable society.

Our group's products are used in a wide range of fields, including housing, infrastructure, electric vehicles, digital transformation (DX), and green transformation (GX), and support the foundations of people's lives and industries. Many of these products also help reduce greenhouse gases. In June 2021, the Japanese government identified 14 essential areas to aim for carbon neutrality in 2050. The ratio of sales in these 14 areas to the Group's consolidated sales in FY2022 is approximately 70%. We will continue to contribute to the carbon neutrality of society as a whole by focusing on developing, manufacturing, and expanding sales of these products. We plan to make a new ¥100 billion investment in the Gunma Complex and Shin-Etsu Silicones (Thailand) Ltd., among other sites, to improve the functionality of our silicone product lineup and expand our range of environmentally friendly silicones that contribute to carbon neutrality. Furthermore, in October 2023, we established the Sustainable Silicone Business Development Department to strengthen the development and sales of environmentally friendly products.

Source: Green Growth Strategy Through Achieving Carbon Neutrality in 2050 (announced in June 2021 by the Japanese government)
https://www.meti.go.jp/english/policy/energy_environment/global_warming/ggs2050/pdf/ggs_full_en1013.pdf

Topic

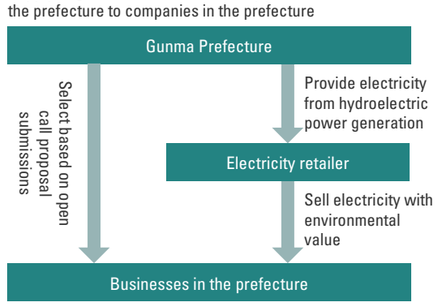
Reducing greenhouse gas emissions by participating in "Local production for local consumption type PPA (Gunma model)"

In March 2024, Shin-Etsu Chemical decided to participate in the "Local production for local consumption type PPA"* (hereinafter, "Gunma Model") offered by Gunma Prefecture. The Gunma Model is a new system that supplies electricity from Gunma Prefecture's hydroelectric power plants to businesses in Gunma Prefecture. The electricity generated by hydroelectric power generation is green electricity that does not emit greenhouse gases. The new electricity procured through this program will cover all of the electricity used at the Yokonodaira Plant at Shin-Etsu Chemical's Gunma Complex, enabling the plant to reduce its greenhouse gas emissions by approximately 90%.

*PPA: Abbreviation for "power purchase agreement." A type of contract in which an electricity user purchases electricity from a power producer at a fixed unit price for a fixed period of time.

Gunma PPA model (FY2024 onwards)

Supply CO_2-free renewable electricity produced in the prefecture to companies in the prefecture



Gunma PPA model
(based on materials provided by Gunma Prefecture)

Natural Capital

Recognizing the effective use of limited resources and the circular economy as important issues, the Shin-Etsu Group is actively working to address them, with the aim of not only contributing to the global environment but also increasing our competitiveness and ensuring sustainable development.

Waste reduction

As part of our efforts to conserve resources, the Shin-Etsu Group is promoting waste reduction initiatives at each location with a target of zero waste emissions (landfill waste of 1% or less of the final amount of all waste generated) at our consolidated companies in Japan.

For example, the Naoetsu Plant makes effective use of unneeded paper materials discarded in the manufacturing process to make recycled paper and other products. The plant is also working to reduce the amount of waste solvent that becomes industrial waste by refining and recycling organic solvents that have already been used in chemical reaction processes. In FY2023, the plant achieved a reduction of 24 tons of waste solvents, thereby helping to conserve resources and reduce environmental impact.

Furthermore, the plant's wastewater treatment facilities separate and dehydrate the inorganic solids contained in the wastewater to make a solid sludge. This sludge is treated as industrial waste by an external contractor and is put to effective use as roadbed material and the like. We also replaced the dehydrator in the wastewater treatment facility with a new model with superior dehydration performance, which reduced the amount of water in the waste sludge, thereby reducing the weight of waste for disposal.

Resource circulation

In terms of resource circulation, the Group collaborates with customers and related industry groups, using cutting-edge technologies to recover used products, extract resources, and reuse them in the Group's products.

For example, in 2007 we started recycling magnetic powder from the processing of rare earth magnets. Furthermore, since March 2013, we have also been developing techniques to recycle the rare earth magnets used in recovered power-saving air conditioners and hybrid cars.

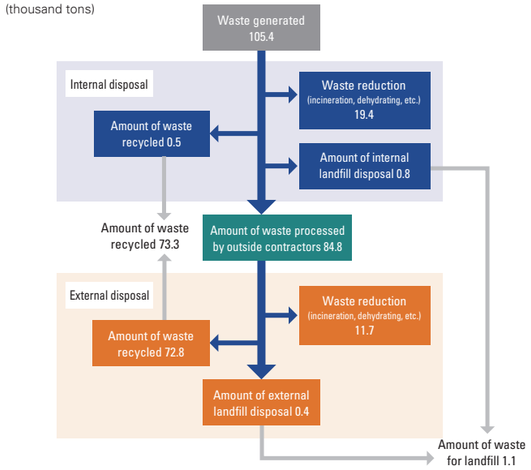
PVC products such as PVC pipes and flooring material in particular are increasingly being recycled because the impact of foreign matter contamination is small. The most common form of material recycling is to recycle used PVC products as raw materials to create new PVC products. In particular, 60% of used PVC pipes and joints are recycled for reuse in new PVC pipes and joints, and 70% of agricultural film is recycled for use in flooring material.

Metrics and targets	
FY2023	
Targets	Achieve zero waste emissions. Promote the reduction of waste generation in terms of production intensity.
Results	The final waste landfill disposal rate was 1.08% in Japan
Evaluation	The target was achieved in Japan
FY2024	
Targets	Achieve zero waste emissions. Promote the reduction of waste generation in terms of production intensity.

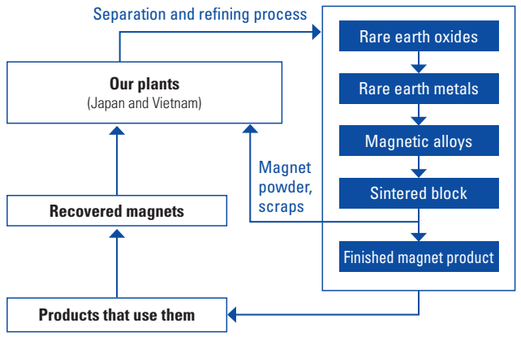
*The scope of target for the waste reduction is Shin-Etsu Chemical Co., Ltd. and consolidated in Japan.

In FY2023, the amount of waste we generated in Japan decreased slightly compared to the previous year.

Flow of Waste Disposal (Japan)



Recycling of rare earth magnets



The Shin-Etsu Chemical Gunma Complex, which manufactures highly functional materials such as silicones, draws almost all of the water required for manufacturing from nearby rivers and purifies the wastewater from the complex before discharging it. In addition to minimizing the intake of water from rivers, the complex reuses water in its manufacturing and water-cooling processes by recycling and circulating inside the complex. In addition, the water is purified before being discharged into the river, and the water quality is analyzed regularly to ensure that it complies with standards at a high level.

Meanwhile, since its foundation, Asia Silicones Monomer Limited has been making effective use of the abundant rainfall it enjoys in its location in Thailand. It stores rainwater in storage tanks on-site, using it for industrial water and as coolant for waste gas incinerator. It also supplies Shin-Etsu Silicones (Thailand) and its nearby partners with industrial water using rainwater.

Metrics and targets	
FY2023	
Targets	Reduce water withdrawal in terms of production intensity at an average annual rate of 1%. Reduce water pollutant discharge in terms of production intensity at an average annual rate of 1%.
Results	Intensity at the average annual rate from FY2020 to FY2023 was decreased by 17.7% in terms of water withdrawal and increased by 1.6% in terms of BOD emission.
Evaluation	The target was achieved for water withdrawal, not achieved for BOD.
FY2024	
Targets	Reduce water withdrawal in terms of production intensity at an average annual rate of 1%. Reduce water pollutant discharge in terms of production intensity at an average annual rate of 1%.

Rainwater is collected and used to provide industrial water to neighboring partner companies (Asia Silicones Monomer Limited)

The Group conducts its business activities in a way that takes into account global ecosystems. For example, when purchasing pulp derived from wood, which is the main raw material in our cellulose derivatives, we confirm that all our pulp suppliers have all obtained national and/or international forest certifications. In addition, in February 2021, the Company participated in a meeting of the Roundtable on Sustainable Palm Oil (RSPO) as an associate member. The RSPO is a non-profit organization that promotes sustainable growth and use of palm oil by way of cooperation within the supply chain and open dialogue with interested parties. The Company agreed with the purpose and participated in the RSPO, and obtained mass balance certification in March 2023.

Reduction of chemical emissions

The Shin-Etsu Group strives to prevent health hazards and minimize environmental impacts related to chemicals throughout the processes of development, manufacturing, distribution, usage, consumption, and disposal of chemical substances. We appropriately design chemical substances in accordance with laws and regulations, evaluate their safety based on the latest information collected in cooperation with administrative bodies and affiliated organizations, and manufacture them at optimal facilities to reduce emissions of chemical substances.

Metrics and targets (Prevention of air pollution)	
FY2023	
Targets	Reduce emissions of air pollutants in terms of production intensity at an average annual rate of 1%.
Results	The annual average rate from FY2020 to FY2023 is an increase of 11.1% in Soot in terms of intensity, and a reduction of 7.1% in SOx in terms of intensity.
Evaluation	The target was achieved for SOx, not achieved for Soot.
FY2024	
Targets	Reduce emissions of air pollutants in terms of production intensity at an average annual rate of 1%.

Prevention of Air Pollution

The Group is working to reduce emissions of air pollutants by setting emission reduction targets at each of our Group companies and by converting to the use of fuel components with less sulfur.

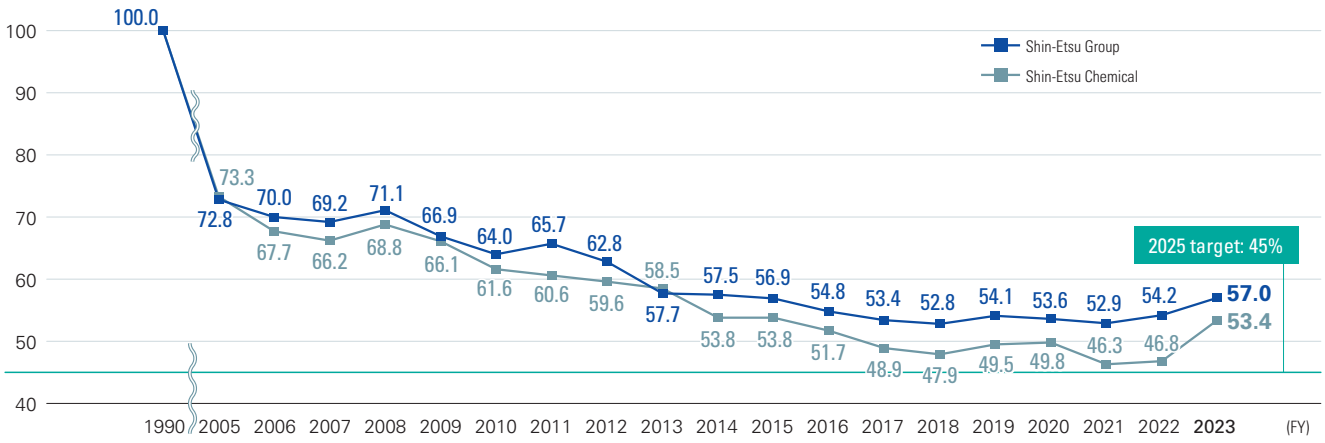
Prevention of Soil Pollution

The Group monitors groundwater and soil in accordance with soil contamination-related laws and regulations, and we make sure that we are in compliance with laws and regulations. In FY2023, Shin-Etsu Chemical performed groundwater and soil monitoring 246 times at its plant sites.

Natural Capital

Indicators about energy-saving, resource-saving, and the reduction of the environmental impact

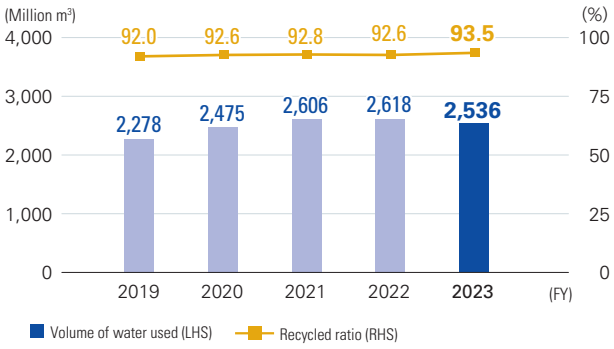
Changes in greenhouse gas emissions (emission intensity index of production volume relative to FY1990*)



*Greenhouse gas emission intensity index (FY1990 = 100)

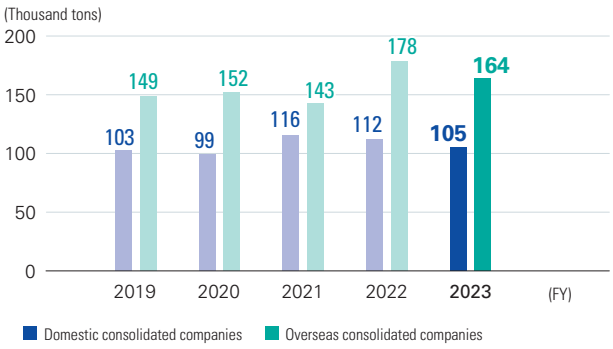
(Note) Emission intensity index of production volume relative to FY1990 includes non-consolidated group companies. In calculating the index, CO_2 emission factors for electricity are averaged from 2000 to 2009 so that efforts to reduce electricity can be clarified. Furthermore, to clarify our efforts in energy reduction and rationalization, the figures do not include additional emissions categories associated with the amendments to Japan's Order for Enforcement of the Act on Promotion of Global Warming Countermeasures that took effect on April 1, 2024.

Water usage*/Recycled ratio (Consolidated)

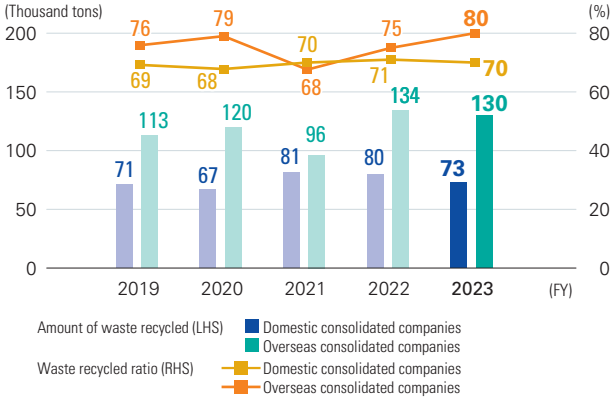


*Total quantity of water withdrawal and recycled water

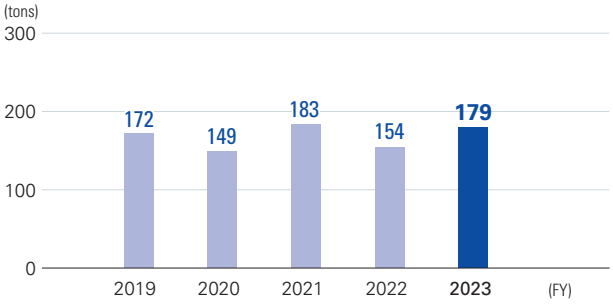
Amount of waste generated



Amount of waste recycled/Waste recycled ratio



Gross discharge of substances designated under the pollutant release and transfer register (PRTR) system



*Figures are totals for Shin-Etsu Chemical and domestic consolidated companies based on the PRTR system in the Law for Promotion of Chemical Management.

(Note) Total emissions in FY2023 increased due to an increase in the number of substances covered by the revised PRTR Law (effective April 1, 2023), while emissions of substances covered by the law before the above revision decreased.