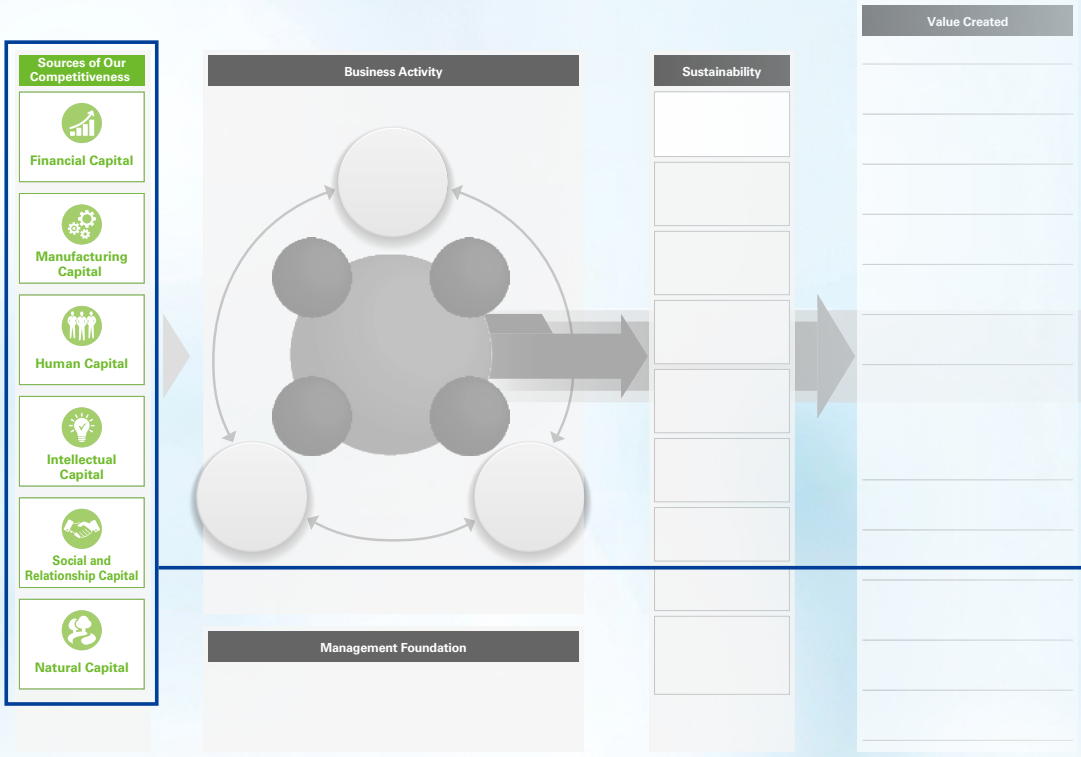
Sources of Our Competitiveness

Sources of competitiveness that support the sustainable development



Financial Capital

Enhancing shareholder returns while continuing capital investments on a solid financial footing

- Equity ratio **82.6%**
- Net assets **4,837.5 billion yen**
- Capital expenditures **434.5 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: **18 companies, 41 bases**
- Overseas production bases: **17 countries, 66 bases**

Human Capital

Developing T-shaped human resources with optimal staffing in pursuit of a more efficient and energetic way of working

- Operating income per employee **27.21 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 **14 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) **56.9%**

Financial Capital

Enhancing shareholder returns while continuing capital investments on a solid financial footing

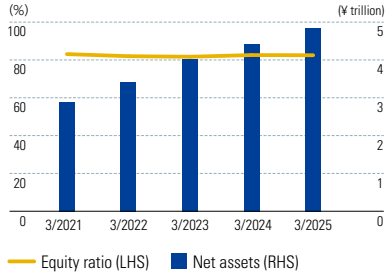
Electronic materials and highly functional silicones drive earnings

In the fiscal year ended March 31, 2025 (FY2024), the polyvinyl chloride (PVC) business worked to revise prices in key regions. Outside of North America, however, the sluggish supply and demand situation continued against the backdrop of exports from China, where domestic demand remains stagnant. Meanwhile, we focused on expanding sales in growing markets such as semiconductor materials (including silicon wafers, photoresists, and photomask blanks), rare earth magnets, and our highly functional silicone product lines.

As a result, our operating income was ¥742.1 billion (up 5.9% year on year), and net income attributable to owners of parent was ¥534.0 billion (up 2.7% year on year). In addition, total net assets were ¥4,837.5 billion (up 9.3% from the end of the previous fiscal year), the stockholders' equity ratio was 82.6%, ROIC was 18.2%, and ROE was 12.0%.

Equity ratio/Net assets

Equity ratio
(as of March 31, 2025)
82.6%
Net assets
(as of March 31, 2025)
4,837.5 billion yen



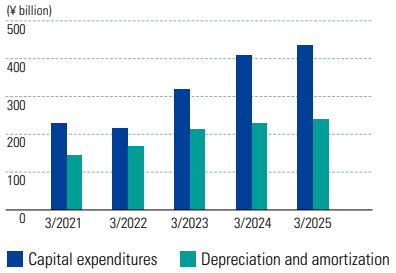
Steadily advancing capital investment for sustainable growth

To enhance competitiveness and sustain growth, Shin-Etsu Chemical seeks to enhance corporate value through the active and timely use of its internal funds. The Shin-Etsu Group's capital expenditures in FY2024 totaled ¥434.5 billion (up 6.8% year on year), reflecting progress in planned investments such as PVC resin facility expansion at Shintech, construction of a new production base for semiconductor lithography materials, and capacity expansion for our lineup of highly functional silicone products. Capital investment for FY2025 is expected to be ¥370.0 billion.

The new Shintech plant in Plaquemine, Louisiana, with an annual production capacity of 400,000 tons of PVC, commenced operations in 2024.

Capital expenditures/Depreciation and amortization

Capital expenditures
(for the year ended
March 31, 2025)
434.5 billion yen

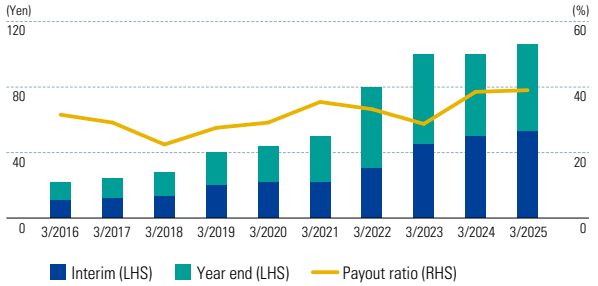


Dividend increase and a share buyback worth ¥500.0 billion

The Company is implementing its capital policy, by balancing growing business earnings with maintaining solid financial foundations, while paying close attention to ROE and the cost of capital. Shareholder returns are at the core of this policy. The Company is striving to achieve stable dividends and is raising the medium- to long-term target dividend payout ratio to around 40%. The annual dividend for FY2024 was ¥106 per share (corresponding to a dividend payout ratio of 39.3%), an increase of ¥6 from the previous fiscal year.

In addition, the Company repurchases its own shares in a flexible manner based on stock price levels and other factors. A new share buyback, not to exceed ¥500.0 billion, was initiated in May 2025. The purchase amount is equivalent to 6.4% of our market capitalization, and is expected to have the effect of raising ROE by 1.5 points.

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.

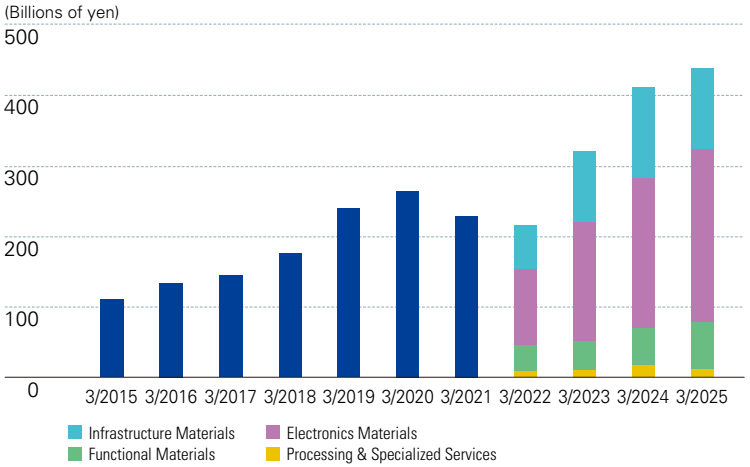
Current status of capital investment

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 capital investments (that have been announced)

Business Segment	Products	Projects	Investment Amount	Status
Infrastructure Materials	PVC	New facility expansion [Phase 2] (U.S.)	$1.25 billion	Completed
Electronics Materials	Semiconductor lithography materials	Build a new manufacturing and research-and-development base (Japan)	¥83.0 billion	In progress
Functional Materials	Silicone resin	Reinforcement of the production capacity for advanced functional products line (Japan)	¥80.0 billion	In progress
	//	Expand the applications of our silicones products and work to enhance the advanced functionality of our products lineup and expand our environmentally friendly silicones (Japan, Thailand, etc.)	¥100.0 billion	In progress
	//	Build a manufacturing plant (China)	¥2.1 billion	In progress
	Cellulose derivatives	Expand manufacturing facilities for pharmaceutical excipient (Japan)	¥10.0 billion	In progress
	//	Expand manufacturing and storage facilities for pharmaceutical excipient (Japan, Germany)	¥10.0 billion	In progress

Capital investment



Sales by Manufacturing Location for Each Segment (FY2024)

(Billions of yen)

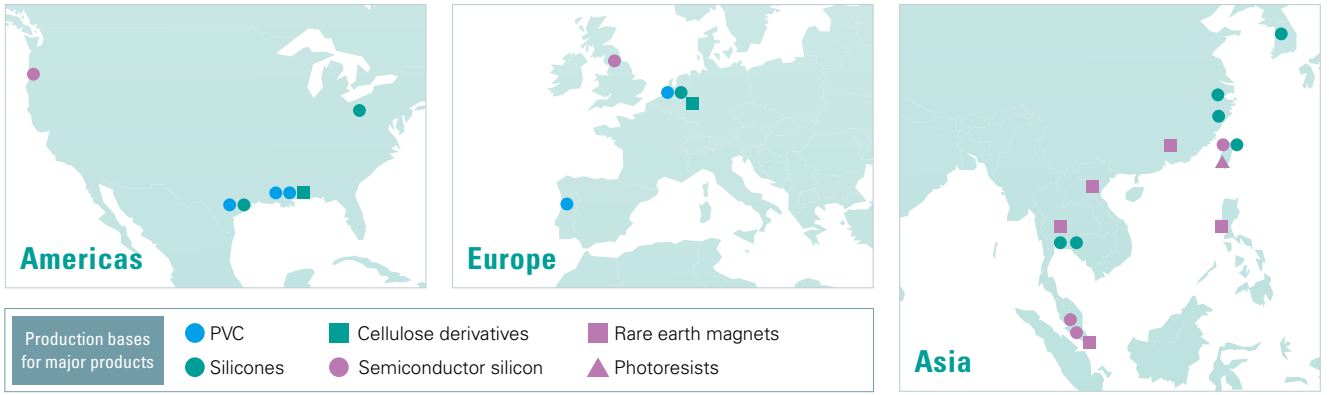
	Goods Manufactured in Japan	Goods Manufactured overseas	Total
Infrastructure Materials	123.3	918.2	1,041.5
Electronics Materials	764.0	170.2	934.3
Functional Materials	287.3	161.2	448.6
Processing & Specialized Services	103.5	33.1	136.7
Consolidated	1,278.2	1,282.9	2,561.2

Manufacturing Capital

Risk-aware supply network

In addition to building a local production system directly linked to local demand, the Shin-Etsu Group has 66 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 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



Employee message

Establishment of a magnet production system in Vietnam that integrates everything from recycling to raw materials and finished products

Shin-Etsu Magnetic Materials Vietnam Co., Ltd. **Mr. T.S.**

When we describe resources as “rare metals” or “rare earths,” the word “rare” means either that the resource is found in small amounts on Earth, or that its distribution is limited for technical, economic, or geopolitical reasons. The rare earth elements used in neodymium magnets fall into the latter category, and in fact, they are not as scarce as the name suggests, being mined not only in China but also in the United States and Australia, among other countries. At our Vietnam plant, all the processes for manufacturing neodymium magnets, including the refining and recycling processes, are integrated into one facility. As a result, this plant has the great advantage of being able to produce neodymium magnets that are 100% “Made in Shin-Etsu.”

My responsibilities at the plant in Vietnam are in the area of technical development for recycling and magnetic materials as well as quality control. Currently, we are advancing the development of technology to secure rare-earth resources, and we are now able to refine the raw materials for neodymium magnets right here at our plant in Vietnam. To further augment production capacity and stabilize supply volume in the future, we are proceeding with a project to build a new plant that incorporates the new technologies we have developed into the recycling and refining processes. The supply of rare earth elements has historically been unreliable. However, by leveraging the advantage of our Vietnam plant’s integrated production system, we will continue to develop new technologies and control quality so that we can provide our customers with a stable supply of high-quality magnets.

Shin-Etsu Magnetic Materials Vietnam Co., Ltd.

Manufacturing Capital

Special Feature

The Pursuit of Efficiency Never Ends

Message from the Director in Charge of Technologies

Advancing technology and taking on the challenge of innovation

Representative Director-Chairman of the Board Meeting
In charge of Semiconductor Materials and Technologies
Representative Director & President of Shin-Etsu Handotai Co., Ltd.

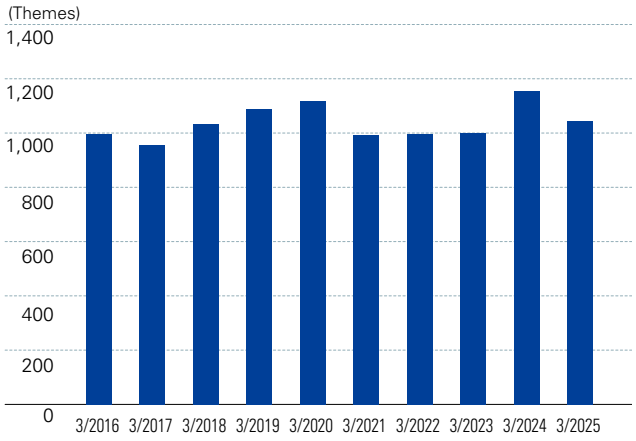
Fumio Akiya

Manufacturing capabilities

In the manufacturing industries, continually improving technological capabilities is an important management issue. A committee started working on this theme in 1992 and continues its activities to this day. Its guiding principles are based on flexible thinking not bound by precedent or conventional wisdom as well as continuous improvement, evolution, and innovation grounded in the principles of science and engineering. Since its inception, this committee has addressed over 25,000 issues in total, supporting the Company's earnings expansion and sustainable growth. Even now, each production site continues to set new themes and take on new challenges.

The results of these efforts are not limited to cost reduction. They have created a virtuous cycle that leads to improved quality, improved product characteristics, energy savings, and reduced greenhouse gas emissions. Going forward, we will continue our relentless pursuit of improving productivity, rationalizing processes, and technological innovation.

Number of rationalization themes



*Data collected from Shin-Etsu Chemical only (non-consolidated).

Unrivaled quality

To succeed in an industry where competition is fierce, it is essential to continue to improve non-price competitiveness. I believe the core of non-price competitiveness is what we call "unrivaled quality."

What leads to unrivaled quality is the combination of our manufacturing capabilities: the ability to develop products that meet the quality requirements of our customers, the ability to mass-produce these products in a stable manner, the ability to minimize variation in quality within the specified standard, and the ability to strictly inspect and control quality before shipment. Going forward, we will continue to focus on providing unrivaled quality that keeps competitors at bay and that earns testimonials from customers like "If it's a Shin-Etsu Chemical product, we can use it with confidence."

Technological innovation

The Company is actively working to shift from batch production (batch processes*1) to continuous production (continuous processes*2). In batch production, cleaning of the reactor is required each time a reaction is completed, leading to downtime during which production is halted.

Continuous production, on the other hand, requires very little downtime because raw materials are continuously fed into the production process. Continuous production has not only dramatically improved productivity, but also stabilized quality and led to labor savings. Going forward, we will continue to work on the transition from batch production to continuous production as an important theme.

Having identified the adoption of cutting-edge technologies as an important issue, we are currently incorporating AI and related technologies into our processes after first verifying their safety. Let me give you a few examples.

Visual inspection, which was previously done manually, can now be automated using neural networks*3, saving labor and reducing erroneous judgments. We also aim to further improve quality by applying machine learning to vast amounts of manufacturing data and re-examining manufacturing conditions using inverse problem analysis*4. Finally, while up until now we have regularly upgraded facilities and equipment before breakdowns occur as a form of preventive maintenance, we are now working to achieve even

Manufacturing Capital

Special Feature **The Pursuit of Efficiency Never Ends** | **Message from the Director in Charge of Technologies**

more accurate upgrades by using AI to predict when breakdowns are likely to occur.

Recycling

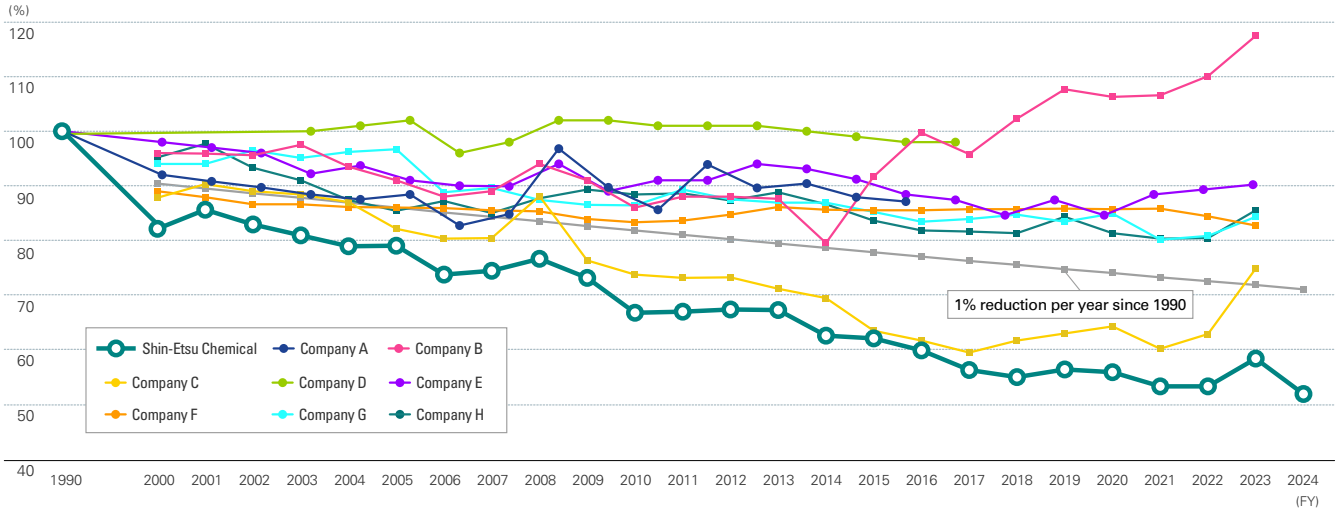
Recycling, the efficient use of resources and materials without waste, is an important issue for society as a whole. Shin-Etsu Chemical has been involved in recycling for many years.

A representative example is the recovery and reuse of thermal energy generated from the manufacturing process. Each of our production sites has implemented a variety of such measures. Thoroughly using up thermal energy without waste leads to energy savings and reduction of greenhouse gas emissions. Furthermore, thanks to the shift to continuous processes, which I mentioned earlier, unreacted raw materials and by-products, which were previously waste, can now be reused as raw materials instead of expelling them, leading to a reduction in waste and an improvement in the variable cost per unit of production.

The rare earth magnets business and the PVC business have taken the lead in recycling raw materials and products, and we are pursuing this possibility in other businesses as well. We are currently working to reduce the amount of wastewater discharged by changing our manufacturing methods, as well as working to recover raw materials and valuable materials from waste liquid that was previously outsourced for treatment, thereby improving production intensity and reducing our environmental impact.

Regarding water recycling, we are focused on reusing the water used for cooling and cleaning. Cooling water is thoroughly reused in the manufacturing process after heat energy has been recovered. We are also encouraging the reuse of cleaning water discharged during the product washing process, further promoting the effective use of precious water resources.

Changes in Energy Consumption by Chemical Companies in Terms of Production Intensity Relative to the FY1990 Level*



*Source: Published materials from each company
Aggregation scope: Non-consolidated
Company A has not disclosed production volume since 2015; Company D since 2016; Company E since 2022.
Energy consumption is converted to crude oil equivalent

Taking on the carbon neutral challenge

In May 2023, Shin-Etsu Chemical formulated and announced its plan to become carbon neutral by 2050. Led by the committee I mentioned earlier, we have worked to maximize resource and energy use efficiency. As a result, our greenhouse gas emissions per unit of production have been reduced by half compared to 1990, and we continue to challenge ourselves to further reduce emissions.

At this point, we have identified 22 tasks aimed at carbon neutrality and are working diligently to investigate, research, and implement them. Achieving carbon neutrality is a big challenge for companies like us in the materials industry, since we require resources and energy to produce goods. Carbon neutrality cannot be achieved using only the technologies currently available. In other words, technological innovation will be essential. I believe it is a challenge worth taking on, precisely because it is a difficult task. Shin-Etsu Chemical has many talented people who have boldly taken on difficult challenges and made technological innovations. Relying on the technological strength we have honed over the years and our strong will to set and achieve ambitious targets, we will continue to work to achieve carbon neutrality and the sustainable growth of the Company.

*1 Batch production (batch processes): A method in which raw materials are input for each delimited production cycle and the production is transferred to subsequent processes for each of these cycles, eventually resulting in a batch of final products. Batch production requires starting and stopping the reactor and cleaning it during downtime.
*2 Continuous production (continuous processes): A method of production in which the input of raw materials, reactions, and extraction of products are carried out continuously. It is more productive because once started, it operates continuously, with no need to interrupt the reaction for cleaning or other maintenance.
*3 Neural network: A machine learning model that uses AI to process data in a way that mimics the workings of the human brain.
*4 Inverse problem analysis method: An analysis method that estimates the input from the output

Manufacturing Capital

Special Feature The Pursuit of Efficiency Never Ends | Employee Roundtable

Employee Roundtable Engineers Discuss the Future of Manufacturing

Our future manufacturing is built on more than 30 years of rationalization efforts

Yosuke Hamano
Production Engineering Department, Gunma Complex

Hiroyuki Otsuka
Technology Department, Head Office

Takeshi Ishida
Production Department 1, Naoetsu Plant

Past Initiatives of the Rationalization Committee

Ishida The Naoetsu Plant's Production Department 1, where I work, has been in operation for over 60 years, and over that period, it has focused on a variety of themes and worked to rationalize its operations and improve its productivity. For older plants, the issue is not simply replacing aging equipment with new equipment, but how to implement these upgrades in a way that enables continuous improvement. For example, we have been able to achieve both energy savings and reductions in greenhouse gas emissions by coming up with creative engineering designs such as reducing electricity consumption through effective use of waste heat (which can be recovered and used to generate steam) and waste cold from the manufacturing process.

Such efforts require more than just desktop calculations; verification at an actual plant is indispensable.
To verify the validity of our designs, we gather analysis data from sampling along with daily monitoring data. Even for proposed improvements that at first glance do not seem cost-effective, we try to increase their chances of implementation in various ways, for example by revising the specifications or increasing the number of bidders on the project. When it comes to achieving results in rationalization and productivity improvement, I believe the key requirements are familiarity with the worksite, flexible thinking, and tenacious research.

Otsuka I work at our head office in the Technology Department, which is responsible for promoting rationalization, quality control, facilities management, energy saving, and automation at each plant. While the actual implementation is done at the factory level, we at the Technology Department coordinate and share information from the head office across various plants to support their activities. My main theme is the promotion of automation, and I am working on integrating AI and DX into our worksites.

In my work on utilizing AI to rationalize processes, one of the challenges I faced was that AI by itself could not identify defect causes and predict breakdowns. The AI merely indicates correlation, while determining causation requires technical knowledge of engineers. For example, when we

Manufacturing Capital

Special Feature **The Pursuit of Efficiency Never Ends** | **Employee Roundtable**

tried using AI to predict the failure of rotating machinery, it didn't work well, but we finally found a solution through hypothesis and verification based on domain knowledge (expert knowledge in a specialized field). In the future, AI may well acquire all the knowledge we have, but the final decision will remain in the hands of people. Rather than blindly looking to AI for solutions, the key to rationalization is to understand the nature of the technology and to make decisions based on fundamental principles.

Hamano I have been involved in the implementation of AI and DX at the Gunma Complex. In connection with this, as part of our efforts at rationalization and productivity improvement, we constructed an AI model that predicts physical property values based on experimental data and operating conditions, and utilized it for optimization. This allowed us to shorten the investigation period, which traditionally took ten years, to just two months. This is the power of AI. The challenge in this case was how to prepare the high-quality dataset required to create a highly accurate model. We reviewed the existing data and conducted additional experiments to fill in any gaps. We also incorporated simulation data and data published in the literature to improve the quality of the data, and as a result, we succeeded in constructing a practical AI model.

Background to Shin-Etsu Chemical's longstanding rationalization activities

Otsuka The Rationalization Committee's efforts began in 1992 and have continued for more than 30 years. I believe the reason why the Rationalization Committee has been active for so many years is because its rationalization activities are carried out from both bottom-up and top-down perspectives. In other words, one of our major strengths is the combination of our ability to propose solutions at the worksite and our management team's understanding of technology.

In particular, our system for evaluating the benefits of rationalization quantitatively from the perspectives of both actual and expected values, and then setting and tracking goals at the department level, supports a sense of satisfaction and a desire for continuous improvement at each worksite.

Furthermore, the quality of our rationalization activities has increased because top management makes decisions based on scientific and technological principles and gives precise instructions to the engineers, which makes them more likely to follow through.

Ishida From a top-down perspective, I feel that it is also important that the inquisitive spirit and attitude of the top management has been deeply ingrained in the engineers. Rather than just sending out messages, top management offers direct advice and feedback on proposals from the field at hearing sessions and meetings, which boosts the morale of the engineers. This direct, face-to-face communication inspires a sense of responsibility to "get it done" in the recipients, which is what sustains the activities. Another important element supporting these rationalization activities is that a corporate culture has taken root that follows up on issues raised and sees them through to completion.

Hamano I also believe that one of the reasons the Rationalization Committee activities have continued for so many years is the Company's deeply rooted corporate culture of "learning by doing." We have many people with the mental flexibility to apply insights gained from past themes to new challenges, for whom rationalization and new challenges are inseparable like the wheels on a car. In addition, when employees tackle multiple challenges, their energy becomes contagious, stimulating those around them and inspiring a positive chain reaction of commitment to excellence. I feel that such an environment enables continuous improvement.

Future themes to be addressed by the Rationalization Committee

Hamano In terms of themes that the Rationalization Committee should address going forward, I believe that it is important to further promote operational reforms using AI

and DX. In addition to utilizing MI (material informatics) and PI (process informatics) in both research and manufacturing, I would like to incorporate AI models into areas such as monitoring and controlling production lines, as well as predictive maintenance*, to achieve automation and efficiency.

However, since it will take time for all employees to become adept at using AI, it will first be necessary to accumulate successful case studies of AI utilization to increase interest. In the future, I would like to serve as a bridge between chemical industry and AI by taking on the role of an "AI consultant" who visits departments facing challenges and helps resolve them.

*Predictive maintenance: A method for predicting the maintenance required to prevent equipment failure.

Ishida I am also focused on the utilization of AI. I believe that going forward the Rationalization Committee should work on the utilization of AI at our manufacturing sites, specifically in the areas of fully automated operation and predictive maintenance. If full AI-based automation could be implemented in a continuous chemical production line, it could be expected to reduce manufacturing inconsistencies caused by human involvement and bring about rationalization in many areas, including stabilizing quality, saving energy,

Manufacturing Capital

Special Feature **The Pursuit of Efficiency Never Ends** | **Employee Roundtable**

and reducing greenhouse gas emissions. Similarly, in the area of equipment maintenance, introducing AI-based anomaly detection and condition monitoring would allow us to prevent sudden equipment failures before they occur, ensuring stable operations while reducing costs. I believe that by accumulating technology in-house and sharing success stories, we will be able to accelerate rationalization across the entire Company.

Otsuka From my perspective in the Technology Department at the head office, given that the manpower available at each plant is limited, one of our responsibilities at the head office is to eliminate any unnecessary tasks. Therefore, in terms of themes that the Rationalization Committee should address going forward, I think it is important to support the operational efficiency initiatives led by the head office.

At our worksites, there is a trend towards increasing paperwork for safety and management reasons, which is creating a heavy burden. By utilizing generative AI to automate document creation, I hope to reduce the workload on-site and create an environment where people can focus on their core tasks.

Furthermore, as securing human resources becomes more challenging, promoting automation is essential;

however, the adoption of AI and DX requires a certain level of literacy in those domains. Therefore, it is important to train our employees and raise their baseline level of knowledge at the same time. On the other hand, adopting AI or DX should not be an end in itself. Instead of treating these technologies as a black box, it is important to understand the fundamental principles underlying them. The goal is to achieve continuous, sustainable improvement without losing sight of the core purpose of rationalization.

Passing on skills to the next generation

Otsuka Passing on skills to the next generation has become a major issue in the Japanese manufacturing industry. It's fair to say that our Company faces the same challenge. When it comes to skills used in manufacturing, simple equipment operations can be passed on using standard operating procedures and manuals, but passing on know-how that is difficult to put into words remains a challenge.

In the future, it will be necessary to create manuals in video format and incorporate the know-how itself into the automation system. To achieve this, I believe it is essential to raise the level of AI and DX literacy across the entire workplace and create an environment in which everyone can understand and utilize these skills used in manufacturing.

Hamano When it comes to transferring skills using AI, simply presenting examples is not enough. What's important is that everyone feels that they can do it, and that they work in an environment where they can put it into practice immediately when they become interested. Therefore, we have developed an in-house system that makes it easy to build AI models as long as there is data. Even if we are unable to create a highly accurate model, we may find a clue to solving the problem in the process of reviewing the data. In fact, our "consulting-based" support, which demonstrates AI-based solutions to on-site problems right in front of employees, has inspired some of them to develop a greater interest and motivation to learn about AI. I believe

that creating such an environment will lead to the robust transfer of skills.

Ishida The traditional culture of "learning by watching" that has often been used to pass on skills is becoming less and less applicable in modern times. In the future, passing on skills will require preparing not only design documentation and operating manuals but also instructional materials that are visually easy to understand, such as videos.

As Mr. Otsuka and Mr. Hamano mentioned, the Company is also moving forward with the adoption of AI. I believe that actively integrating AI into our manufacturing sites will be essential for further rationalization. On the other hand, as the reliance on AI increases, there are concerns that the skills, knowledge, and intuition of human workers may decline, potentially leading to problems in responding to emergencies. To dispel these concerns, I believe it is important to maintain basic skills by repeatedly educating employees on the fundamentals and principles of science and engineering. I believe that having workers continue to think for themselves on-site based on these principles will lead to efficient skills transfer and further advance our rationalization activities.

Human Capital

Developing T-shaped human resources with optimal staffing in pursuit of a more efficient and energetic way of working

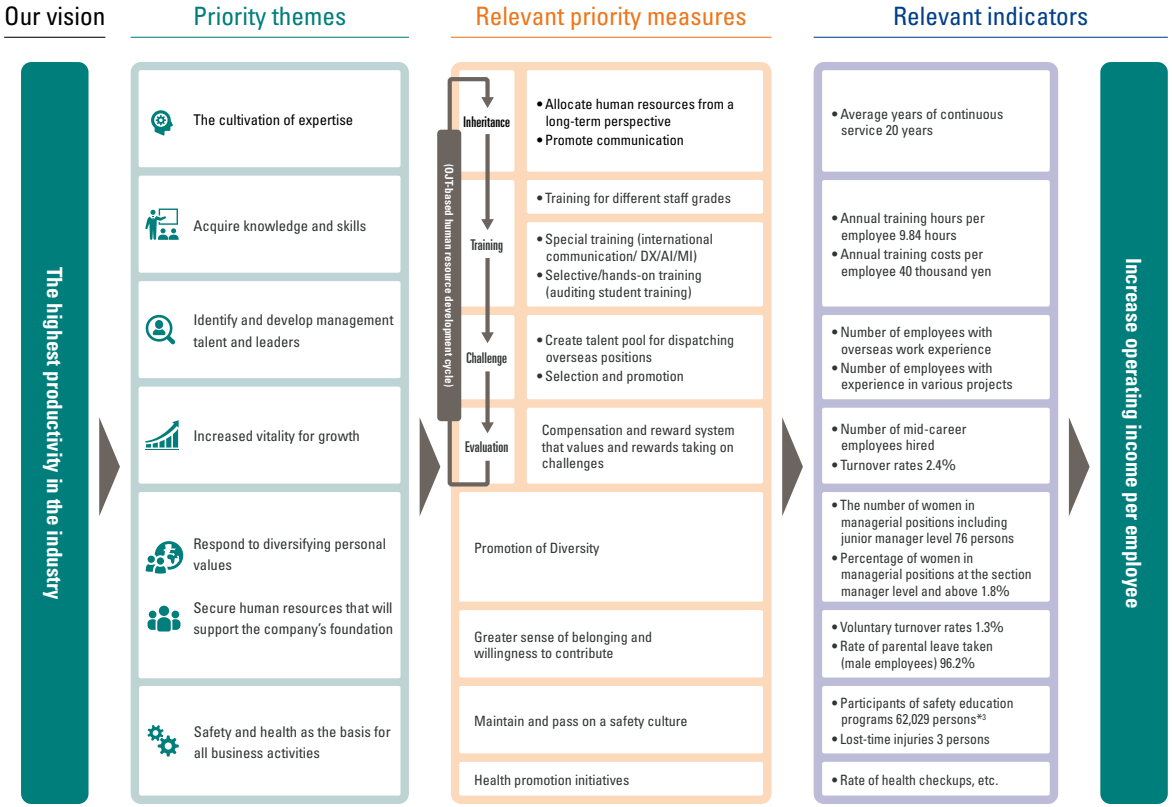
For more information, please see the "People and Safety" section of the Shin-Etsu Chemical Sustainability website.
https://www.shinetsu.co.jp/en/sustainability/esg_social/

Basic policy on human resources strategy

We aim to further improve labor productivity. To this end, we have set operating income per employee as a key indicator and are focusing on developing "T-shaped human resources" who can achieve high productivity. A "T-shaped human resource" is someone who is an expert in a certain task or field, but also has a wide range of work skills that allow them to excel in other fields.

To develop these T-shaped human resources, our human resources development efforts are based on a foundation of on-the-job training (OJT). We place employees into jobs with a sense of respect for their aptitude and professional aspirations, and we support each employee to become a true expert in their assigned job. For this reason, the Company does not implement one-size-fits-all personnel transfers or so-called routine reassignments. By having employees thoroughly study the work they are responsible for, we focus on developing employees with high levels of work ability.

Human capital investment*1*2



*1 Scope: Employees and seconded employees of Shin-Etsu Chemical
*2 Figures listed under "Relevant indicators" are actual results for FY2024.
*3 Shin-Etsu Chemical (Non-consolidated)

Human Capital

OJT-based human resource development program

Empowering employees to grow

In addition to OJT, the Shin-Etsu Group offers a variety of training programs to employees for different stages of their growth. Specifically, the Group supports employees' growth through various training systems, which include training for different staff grades, global communication training, an auditing student system, environmental education, safety education, mental health education, and AI training.

Our training for different staff grades defines the skills that are required at each level of the organization, including management, leadership, communication, and problem-solving skills. Furthermore, because the Group's business partners are spread around the world, with overseas sales now accounting for approximately 80% of consolidated sales, we also provide comprehensive training in meetings and presentations using English as the common language to ensure smooth business operations.

Focus on AI and MI training

The Group is also focusing on its training programs to discover and develop human resources capable of utilizing AI. In FY2024, 194 employees participated, and in the four years since FY2021, a total of 994 employees have participated. We also offer training in materials informatics (MI) with the goals of developing personnel capable of utilizing machine learning for material exploration and shortening R&D time. In FY2024, 49 employees participated, and in the four years since FY2021, a total of 185 employees have participated.

"Domestic study abroad program" to strengthen on-site capabilities

The Company has established a system for sending employees to universities as auditing students for one year with the goal of improving on-site capabilities at each workplace. The program is similar to a study abroad program, except that the students stay in Japan. Each year, up to about ten employees are chosen, mainly operators from plant manufacturing sites, and sent to universities, where they not only acquire specialized knowledge, but also network with people from other businesses and plants that they otherwise may not have much contact with in their daily work. Many of the graduates go on to play key roles in their workplaces.

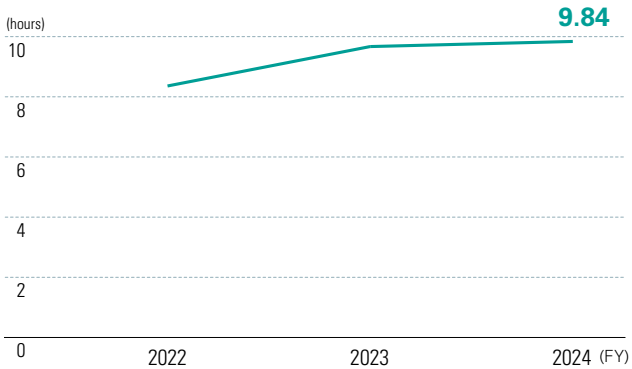
Training system list

	Training for different staff grades	Specialized education: AI management training	Specialized education: MI training	Environment and safety education	Quality control education	Special education	General education
General manager level	Advanced management training; S staff group/ M staff group	Patent training; Training for adaptation to internationalization; English language training; • Meeting skills course I/ II; • Presentation skills course I/II; • Chinese conversation Classes; • Intercultural communication training	DX management training; AI management training; • Basic training; • PBL*2; Onboarding training for new employees	MI*1 training; • Advanced; • Intermediate; • Beginner	Specialized education in environmental control and safety; • Supervisor education; • ISO education; Environmental health and safety education; Hazardous materials safety education; Industrial Safety and Health Act; Radiation; High-pressure gas; Mono-pressure, boilers, etc.		Course for management development training (external training)	Mental health seminars; • Self-care; • Line-care; • Human rights awareness training
Section manager level	Middle management training							
Junior manager level	Line management training; Staff management training				QC intermediate course			
Regular employees	Mid-career employees; Women employees; Junior leader training; Third-year training; New employee induction/ second-phase training			New recruit education	QC basic course	Auditing student system (one year)		

Job group change training

*1 Material Informatics
*2 Problem-based Learning

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 the hours spent on the program has since been included in the training hours.

Human Capital

OJT-based human resource development cycle

Performance-based personnel evaluation system

The Group has introduced an employee evaluation system that emphasizes their ability and work performance. This system aims to increase employees' motivation by reflecting their performance and attitude in the benefits that they will receive, and evaluates how they meet their challenges to achieve higher goals. Employees set ambitious work goals and improvement targets at the beginning of each fiscal year, and are then encouraged to grow by challenging themselves to achieve these goals. Supervisors provide advice and guidance to help employees achieve their goals. At the end of the fiscal year, employees are evaluated on the degree to which they have achieved their goals. At the same time, employees' abilities, potential for growth, and attitude toward their work are taken into consideration to boost their motivation.

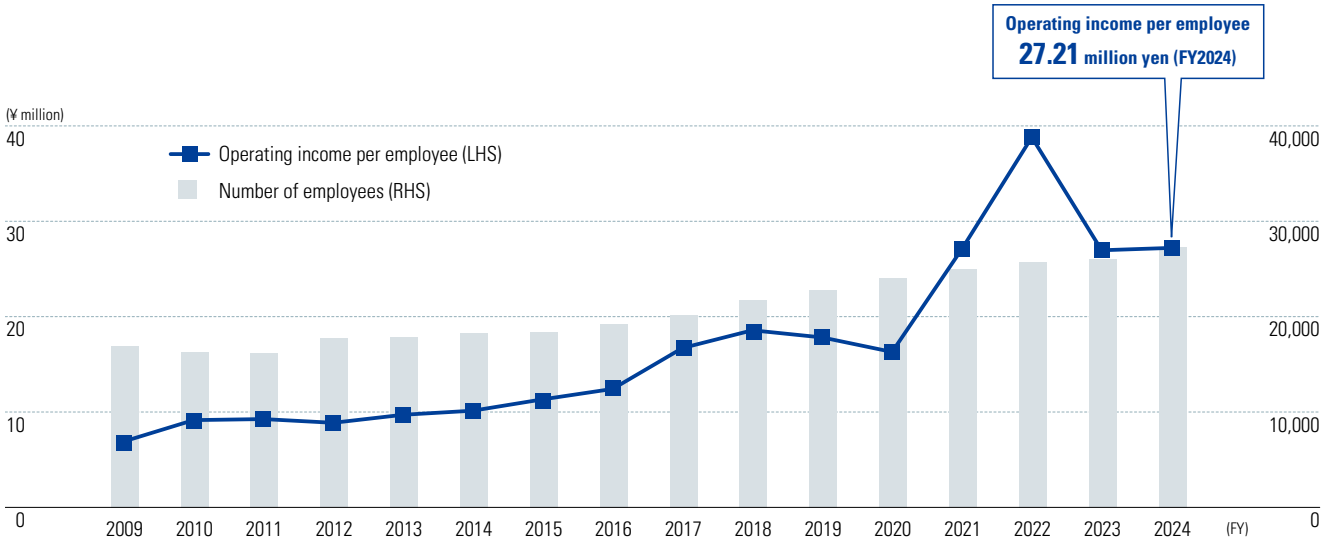
Fair and transparent evaluations

To manage the personnel system in a fair and appropriate manner, evaluation training is provided for all managers who conduct performance review, so that they can carry out personnel evaluations fairly. Transparency is increased by informing evaluation standards to employees. In addition, there is a system of interviews between an evaluator and a direct report to ensure that they can communicate successfully. During interviews, each staff member and their immediate supervisor use Communication Sheets to ensure mutual awareness of expectations and set half-year goals. Furthermore, feedback on progress is given for further development of skills.

T-shaped human resources to support high productivity

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 human resources developed in this way allows the Company to maximize economies of scale during periods of strong demand while comfortably handling a wide range of tasks during periods of low demand. As a result, the average growth rate of the Group's operating income in recent years has exceeded the average growth rate of the number of employees, which means the productivity per employee has also increased.

Operating income per employee (Shin-Etsu Group)



Human Capital

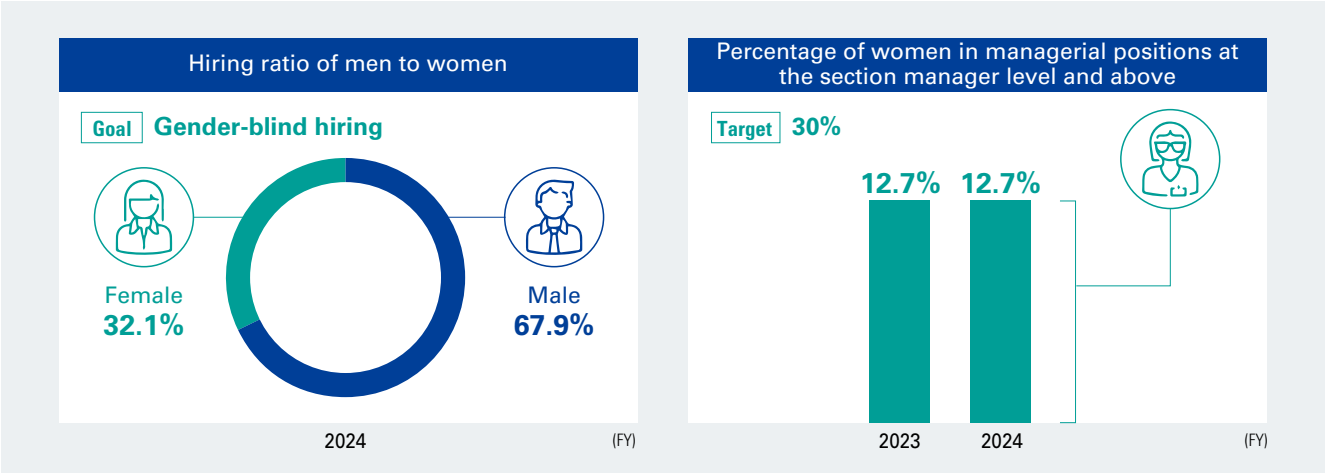
Promotion of diversity

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 is committed to the participation and advancement of women and aims to create a workplace where diverse human resources can contribute to the best of their abilities. We are also focused on local recruitment overseas as well as the hiring of foreign nationals living in Japan so that we can expand our business globally. Meanwhile, we have created employment environment that can accommodate employees aged 60 or older, ensuring that skilled workers at manufacturing sites can make use of their skills and experience and pass them on to the next generation.

Initiatives for work-life balance

The Group places the highest priority on ensuring the stable employment of its employees. Because we believe we can grow when employees feel secure in their jobs, do good work, and achieve good results. Based on this idea, in addition to properly managing working hours and creating an environment where it is easy to take paid vacation, we have put in place systems that allow employees to deal flexibly with various matters that occur in their lives, such as marriage, childbirth, childcare, treatment of illness, and nursing care. These initiatives have inspired a greater sense of belonging among employees and a greater willingness for employees to voluntarily contribute to the growth of the Company.



Scope: Shin-Etsu Chemical and its consolidated companies

Proper management of working hours

The Group aims to raise awareness about managing working hours, and create highly productive workplaces. To this end, we are proactively introducing a system to accurately track working hours through systems such as smart cards for the security gate at the plant entrance and employee PC logs. 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.

Employee engagement

Employee awareness survey

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. Based on these results, we will continue our efforts to make more employees feel fulfilled in their jobs, while further developing the areas where we excel and improving areas that need improvement.

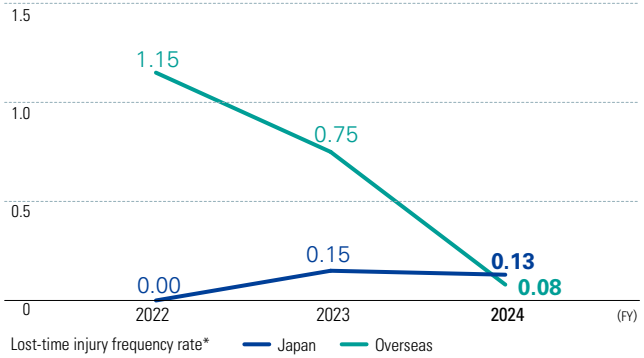
Human Capital

Maintain and pass on a safety culture

Creating safe and comfortable workplaces

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.

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.

Participants of safety education programs (Total number of persons)

	FY2020	FY2021	FY2022	FY2023	FY2024
Shin-Etsu Chemical	32,527	39,348	59,343	70,952	62,029
Consolidated companies	46,998	56,236	75,406	87,349	78,887

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

Physical and mental health of employees

In addition to encouraging regular health checkups, 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.

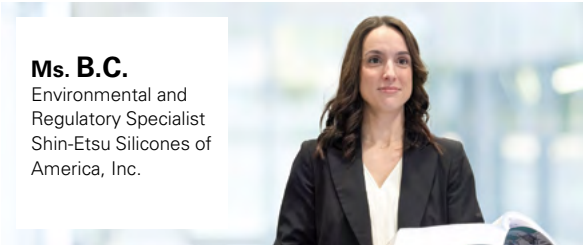
Human Capital

Our Sustainable ACT

The "Our Sustainable ACT" section of the Shin-Etsu Chemical Sustainability website explains the various initiatives and goals that support the Group's sustainability. Here are some snippets from the employee interviews posted on the site.

Shin-Etsu Chemical Sustainability website "Our Sustainable ACT"
https://www.shinetsu.co.jp/en/sustainability/interview/

Interview 01



Ms. B.C.
Environmental and Regulatory Specialist
Shin-Etsu Silicones of America, Inc.

Building a system where all employees contribute to reducing environmental impact

Shin-Etsu Silicones of America, Inc. (SESA) is engaged in many projects to reduce waste and air and water pollution. For example, in accordance with the Resource Conservation and Restoration Act (RCRA), we have installed a triple rinse station for empty pails and drums. Rinsing the containers allows us to rinse and recycle our metal containers that previously contained hazardous materials, rather than disposing of them. We have also initiated a collaboration with an external partner to recycle a portion of silicone materials that otherwise would have been wasted. In addition, by properly managing our solvent-soaked wipes, we have exempted them from hazardous waste regulations set by the Environmental Protection Agency (EPA), which has reduced disposal costs and achieved significant cost savings.

SESA acquired ISO14001 certification at all manufacturing sites in April 2025. We have been implementing environmental impact reduction activities beyond the legal requirements, and in 2023, we received an award from the Ohio Environmental Protection Agency, as well as high praise from the EPA.

SESA is constantly growing and expanding our production output, which requires the input of more resources. On the other hand, SESA has ingrained sustainability into our company culture, and every employee, from the top down, contributes something, bringing us step by step closer to becoming carbon neutral.

Interview 02

Ms. Y.O.
Digital Engineering Department, Engineering Headquarters
Mimasu Semiconductor Industry Co., Ltd.

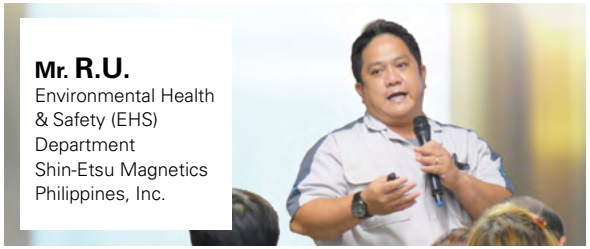
Automating tedious, repetitive tasks to create a more comfortable and productive workplace

I worked in the Quality Assurance Department of the Semiconductor Division for about 10 years, primarily handling tasks such as verifying and compiling shipment data. During that time, I took childcare leave for about a year, and after returning to work, I became involved in automating tasks using RPA (Robotic Process Automation) tools. This led me to the Engineering Department, where I learned programming languages. Currently, I study ways to automate routine tasks and tedious, repetitive tasks that are done manually, and I develop applications using RPA tools and programming languages in response to requests from various departments.

For example, in wafer processing, where the processing recipes involve intricate combinations of conditions depending on the specifications and grades, we created an application that automatically matches over 40,000 device-specific recipes against a master database. This eliminates human error while improving yields and reducing time on task, which reduces overtime and makes work more comfortable.

I am currently taking advantage of the shorter working hours system in order to balance my work with raising my child. With efficiency as my motto, I am striving to eliminate waste and focus on substantive work while maintaining close communication with my colleagues in order to effectively fulfill my managerial duties as a section chief within the limited time available.

Interview 03



Mr. R.U.
Environmental Health & Safety (EHS) Department
Shin-Etsu Magnetics Philippines, Inc.

Preventing incidents and accidents through awareness of on-site hazards and risks

I develop and lead the planning to ensure a safe work environment in the EHS Department at Shin-Etsu Magnetics Philippines (SMP). Specifically, we conduct risk assessments on new processes, machinery, and work areas, and take appropriate measures to address those risks. For example, we take measures to protect employees from the moving and rotating parts of machinery and equipment, and conduct 5S workplace organization audits (the five Ss are sort, systematize, shine, standardize, and sustain). We also pay attention to the health of our employees. In addition to providing SDSs (safety data sheets) for the chemicals used in the manufacturing process, we conduct regular audits to ensure that environmental health and safety measures are being implemented in accordance with Philippine law, and we review and update our procedure manuals.

SMP began new risk assessment activities in 2023, with the EHS Safety Officer, the person in charge of the process, and the actual operator coordinating on a monthly basis on specific processes to identify and assess potential risks, including their likelihood of occurrence. I believe that ensuring all employees are fully aware of the hazards and risks lurking in their work areas is the first step in preventing future incidents and accidents. Each year, we disseminate to employees what incidents and accidents are encountered in SMP along with their root causes and corrective actions, and provide them with opportunities to discuss such root cases and corrective actions.

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.

Tripartite development system and technological advantage

Shin-Etsu Chemical's product development is closely aligned with customer needs, enabling us to develop and supply high-quality products in a short period of time. This is made possible by our unique R&D system based on "tripartite teamwork" among the sales, development, and production teams. R&D centers are set up at production sites, share the market needs the sales department identifies, and work closely with the manufacturing department in order to develop products with a view to mass production.

Meanwhile, development projects that create new value-generating opportunities are being carried out across departments under the direct supervision of the president. In particular, we are focusing our R&D efforts on energy, semiconductor-related materials, optical and high-speed communications, healthcare, and materials that contribute to achieving SDGs and carbon neutrality. We are also focusing on developing innovative manufacturing processes that combine material and equipment technologies. We are constantly evolving our core production and processing technologies, including PVC polymerization technology and silicon wafer crystal growth technology, to solidify our competitive advantage.

Human resource development and accelerating R&D through AI, MI, and computational science

Our researchers communicate with customers on a regular basis and work to develop products that satisfy their needs, while also collecting new technical information through joint research and development with universities and startup companies. In addition, under the strategy of maintaining a research group that is small in number but highly skilled team, we encourage our researchers to conduct their research with patent rights and other IP rights in mind, and in cooperation with the Intellectual Property Department, we 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.

Furthermore, to further shorten development times and create new added value, we are also focusing on the development of human resources who will be responsible for AI and materials informatics (MI) technologies. We are deepening our data-driven R&D efforts based on AI and MI and working to improve the efficiency and speed of material development.

Intellectual Capital

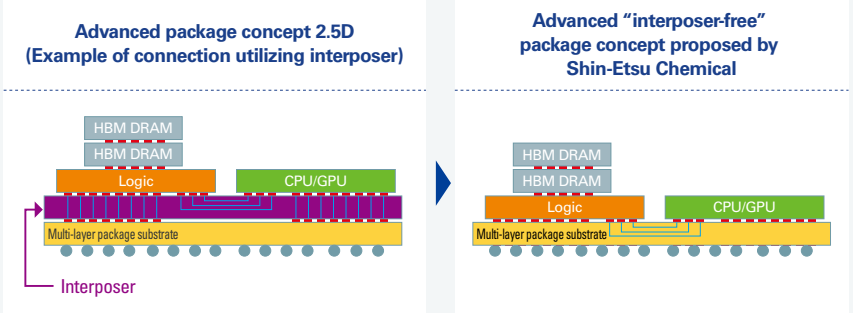
Topic 1

Develop equipment to manufacture semiconductor package substrates for the back end process and pursue a new manufacturing method

We have developed equipment to manufacture semiconductor package substrates with a new manufacturing method subsequently to manufacturing micro-LED manufacturing system. A chiplet, in which circuits are singulated and then assembled in a package, has caught attention as a technology to reduce the manufacturing cost of higher-performance semiconductors. This technology requires a process to mount several chiplets on an intermediate substrate (interposer) and connect them.

To meet this requirement, we developed the Shin-Etsu dual damascene method, which applies the same process used in the front end of semiconductor manufacturing to the back end package substrate manufacturing, and we also developed an excimer laser processing equipment that processes and forms wiring patterns with the same functions as an interposer directly onto a package substrate. This development eliminates the need for an interposer, shortening the process and drastically reducing costs, and makes it possible to perform microfabrication that was not possible with conventional methods.

Advanced package proposed by Shin-Etsu Chemical



Topic 2

In collaboration with SCIVAX, achieved mass production of Amtelus®, the world's smallest light emitting device for 3D sensors

Shin-Etsu Chemical has developed a material that makes possible the mass production of Amtelus®, a light source for 3D sensors developed by SCIVAX Corporation.

SCIVAX has so far sold Platanus®, an optical lens that diffuses and radiates light uniformly, for the 3D sensor light emitting sources that are used in automotive and other various applications, thereby contributing to improving sensor performance. Meanwhile, in recent years, the areas in which 3D sensing technology is utilized have grown wider, driving demand for light emitting devices to be more highly integrated and to have higher performance. With conventional structures, however, it was difficult to reduce the mounting area, which was a major issue.

To solve this issue, Shin-Etsu Chemical has developed a high-hardness material that can be processed by dicing, and that has both the necessary optical properties and a sealing capability to protect devices. Using this material, SCIVAX has successfully developed Amtelus®, the world's smallest light source device that incorporates the functions of Platanus®. This device has achieved a significantly smaller size compared with conventional devices, having a mounting area of 1 mm^2 or less, which is 10 times smaller than conventional devices, and with half or less of the thickness.

Shin-Etsu Chemical and SCIVAX are considering expanding the applications of this technology in the future to various fields, including to vital sign sensors.

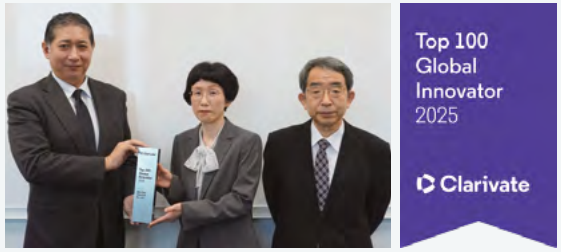
Amtelus®, the world's smallest light emitting device

Topic 3

Only Japanese chemical company to be selected as a Clarivate Top 100 Global Innovator™ for 14 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.

As a result of these efforts, Clarivate, a leading global provider transformative intelligence, has recognized Shin-Etsu Chemical as a Clarivate Top 100 Global Innovator™ for 14 consecutive years. The award is granted to the most influential companies and institutions shaping the global innovation landscape based on an evaluation made using Clarivate's proprietary database. Shin-Etsu Chemical is one of only nine companies in Japan to have been selected for 14 consecutive years, and is the only chemical company among them.



Intellectual Capital

Interview with the General Manager of the Patent Department

The goal is to build stronger barriers to entry

Q1 How would you characterize Shin-Etsu Chemical's intellectual property strategy and the role of the Patent Department?

Since the Company provides a wide variety of material products that support industry and daily life, and the business environment of each business division varies greatly, each division formulates its own intellectual property strategy based on the Company's management policies. Furthermore, to ensure we can quickly respond to rapid market changes, the R&D department has also formulated an intellectual property strategy to promote new research that will lead to new business ventures across divisions.

The Patent Department is responsible for advancing these intellectual property strategies and helping to secure a competitive advantage of our businesses in the marketplace through the acquisition, management, and utilization of intellectual property. Specifically, we aim to secure a competitive advantage that contributes to the Company's profitability by working closely with the R&D department to quickly and reliably acquire the rights to the results of R&D activities that create unrivaled value.

Q2 Shin-Etsu Chemical has received the Clarivate Top 100 Global Innovators™ award for 14 consecutive years. What accounts for the success of our intellectual property strategy?

Companies and institutions eligible for this award are selected based on the number of patents filed and held over the past five years, and are then evaluated based on a combination of "Influence," "Investment," "Success," and "Rarity." Shin-Etsu Chemical scored particularly high in the areas of "Influence" (assessed through the frequency of citations by downstream patent applications) and "Rarity" (an index for measuring the distinctiveness of an invention in terms of how diverse a combination of technologies it contains compared to existing similar inventions). Our high "Rarity" score in particular is evidence to me that we are carrying out highly original, cutting-edge R&D.

Q3 How has Shin-Etsu Chemical's intellectual property strategy evolved over the past 10 to 20 years?

Traditionally, the Company has engaged in mainly "defensive" intellectual property activities from the perspective of ensuring business continuity and flexibility. Over the past 10 to 20 years, however, while continuing these "defensive" activities, we have begun to move toward "offensive" intellectual property activities. These are exclusionary activities focused on securing our competitive advantage over other companies and building barriers to entry.

Traditionally, we protected our products primarily through patent rights and trademark rights. For our products with distinctive product forms, however, we have begun to actively acquire design rights to provide another layer of protection. One example is our insect pest control delivery device that diffuses insect pheromone components into agricultural fields. Another example is our stamp component for transferring microstructures, which is used to transfer microstructures such as semiconductor elements for micro LED displays.

Q4 How would you develop the intellectual property strategy going forward?

I would like to utilize new tools such as generative AI to improve the efficiency of various intellectual property-related tasks. In particular, I would like to work closely with the R&D department to strengthen our efforts to search for and acquire the rights to solutions that meet customer needs starting from the idea generation stage in a way that transcends the boundaries between departments.

Furthermore, with regard to the intellectual property that is generated though our R&D activities, I would like to pursue a strategic combination of acquiring rights by filing applications and keeping it secret in the form of know-how, with the goal of building stronger barriers to entry for other companies.

General Manager,
Patent Department
Shin-Etsu Chemical
Okmi Park

Social and Relationship Capital

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

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. Furthermore, in order to build strong relationships of trust with the local communities in which our plants are located, we place great importance on dialogue with local residents as well as governmental and municipal authorities.

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 respects 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 reappraised 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. The revised Human Rights Policy has been communicated throughout the Group and is also available on our website.

*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.

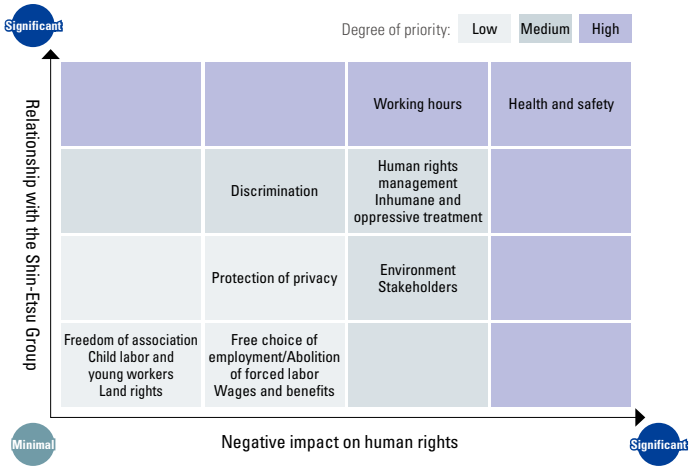
The Shin-Etsu Group Human Rights Policy
https://www.shinetsu.co.jp/en/sustainability/esg_social/human-rights/

Assessing human rights risks and identifying priority issues

In December 2019, we began conducting human rights risk surveys with all Group companies in Japan and abroad to identify human rights risks in the Group's value chain. Then, in 2021, we evaluated the priority of human rights issues based on the risks assumed for the Group from the two viewpoints of "the potential severity of the impact on human rights" and "our relationship with human rights-related risks." As a result, the Group identified potential risks related to health and safety and working hours as high. In addition, in an analysis of the responses to the human rights risk survey, approximately 40% of Group companies responded that human rights management in the supply chain is important, indicating the need to promote efforts to respect human rights throughout the supply chain.

The three priority issues we identified are listed on the next page, along with a description of our efforts in FY2024 to address them.

Identification of priority issues for human rights risks



Social and Relationship Capital

■Working hours
We introduced a system to accurately track working hours through PC logs and promoted the development of working environments that enable flexible and highly productive work styles. Furthermore, in line with regulatory caps on overtime work in the construction industry that took effect in FY2024, we supported the efforts of applicable Group companies in Japan to reduce overtime work.

■ Health and safety
We created the "Shin-Etsu Group Environmental Safety Management Plan," and are actively pursuing it by setting specific numerical targets to improve working environments.

■ Supply chain management
Starting in 2022, we began sending 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 to confirm that there were no high-risk business partners that were in conflict with the human rights issues that we consider serious and that fell significantly below our evaluation criteria.

Implementation of human rights awareness education

In addition to enforcing our human rights policy, we conduct training that addresses familiar human rights themes. The training aims to deepen the participants' understanding of respect for human rights. In addition to familiar human rights themes such as harassment, LGBTQ, and people with disabilities, the training also covers the Shin-Etsu Group Human Rights Policy and other initiatives based on the United Nations' Guiding Principles on Business and Human Rights. In FY2024, we conducted an e-learning program on the topic of gaining a deeper understanding of harassment (attendance rate: 95.7%). Furthermore, we are inviting submissions for human rights awareness slogans in preparation for Human Rights Week in December, aiming to enhance our employees' awareness of human rights.


Employees attending human rights awareness education

Building strong relationships of trust with local communities

We are also making an effort to build healthy relationships with nearby local communities to ensure smooth business operations in each region worldwide.

Topic

The president visits the governor of Louisiana

In July 2024, President Saitoh visited Governor Jeff Landry, who was inaugurated as Governor of the State of Louisiana in the same year, to confirm that the cooperative relationship between Shintech and the State of Louisiana will continue and be further strengthened.

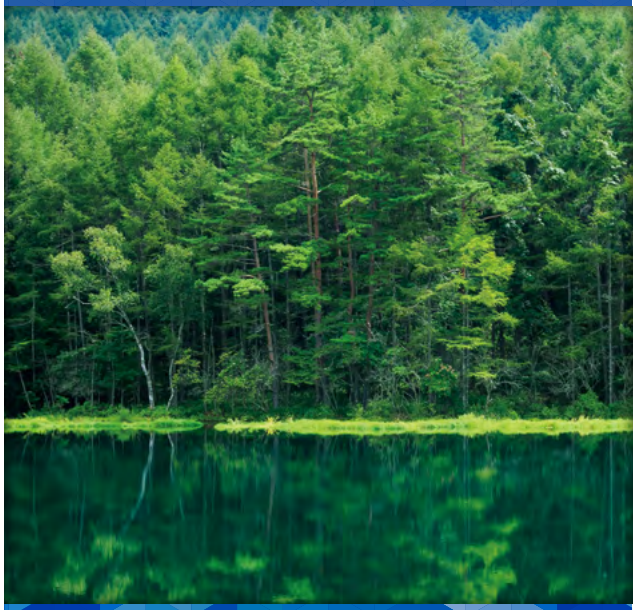
Shintech's Addis Plant began operations in Louisiana in 2000, and the Plaquemine Plant started integrated production from raw materials in 2008. Since then, we have built good relationships with successive Louisiana governors while continuing to make large investments in the state.

At their meeting, President Saitoh requested continued cooperation from the state government for further business expansion in the future, and the Governor expressed positive words of support and appreciation for Shintech's contributions to the local economy and employment.


The president (far left) visiting Governor Landry (second from left)

Natural Capital

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



For more information, please see the "Environment" section of the Shin-Etsu Chemical Sustainability website.
https://www.shinetsu.co.jp/en/sustainability/esg_environment/

Climate change

Climate Change on our sustainability website
https://www.shinetsu.co.jp/en/sustainability/esg_environment/global_warming/

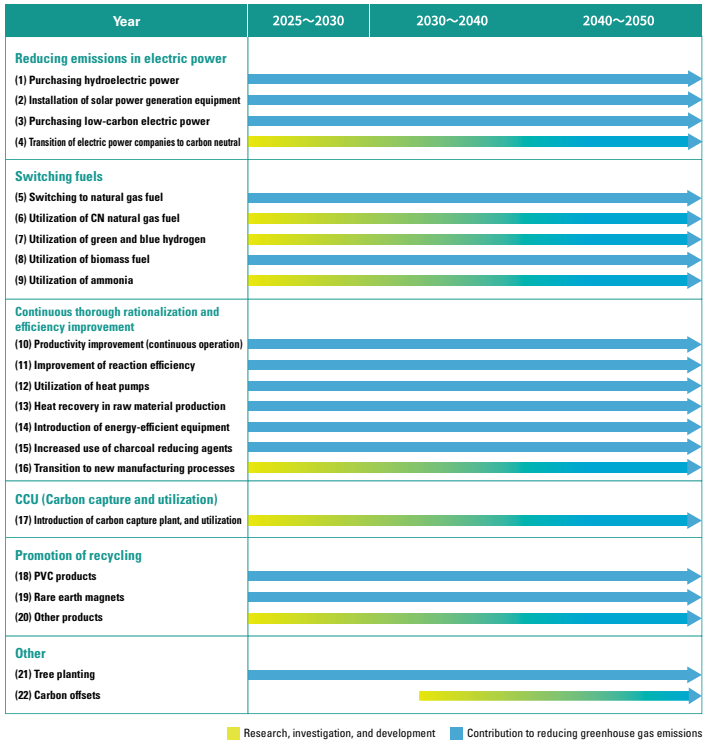
Initiatives aimed at carbon neutrality

The Shin-Etsu Group has developed and is moving forward with a plan to reduce greenhouse gas emissions (Scope 1 and Scope 2) to net zero, with the aim of achieving carbon neutrality by 2050.

The Group is investing in the construction of new plants and expansion projects to drive growth in each business, while simultaneously focusing on maximizing productivity and energy efficiency. A prime example of this is the new facility at Shintech Inc., which was completed and started operation in 2024.

It is difficult to reduce the CO_2 emissions associated with new facility expansion to zero with currently available technology. Therefore, while striving to continuously improve the productivity and energy efficiency of existing plants, we are actively adopting the latest energy-saving equipment and cogeneration systems at new facilities. In addition, as outlined under "Initiatives Aimed at Carbon Neutrality" below, we are aiming to achieve carbon neutrality by 2050 by taking measures such as installing solar power generation facilities, utilizing hydrogen and biomass fuels, and building recycling systems.

Initiatives aimed at carbon neutrality

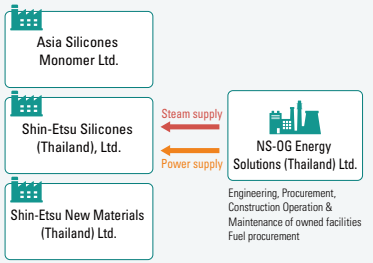


Topic

Reducing greenhouse gas emissions by deploying renewable energy in Thailand

Three Shin-Etsu group companies in Thailand— Shin-Etsu Silicones (Thailand), Ltd., Asia Silicones Monomer Ltd., and Shin-Etsu New Materials (Thailand) Ltd.—will start receiving renewable energy in 2027 from a biomass cogeneration system from NS-OG Energy Solutions (Thailand) Ltd. (NSET), a joint venture between Nippon Steel Engineering Co., Ltd. and Osaka Gas Co., Ltd. NSET will install, operate and manage the facility on the premises of Shin-Etsu Silicones (Thailand), Ltd. Utilizing wooden chips sourced locally from Thailand as fuel, the facility will generate renewable energy in the form of electricity and steam, which will be supplied to all three companies. This initiative is expected to reduce emissions by approximately 48,000 t-CO_2 per year.

Conceptual framework of the project scheme



Natural Capital

Initiatives Aimed at Carbon Neutrality

Amount of reduction of greenhouse gas emissions

The Group has 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. FY2024 results were 56.9% (down 0.1 points year on year) compared to FY1990 for the Group and 48.6% (down 4.8 points year on year) compared to FY1990 for the Company.

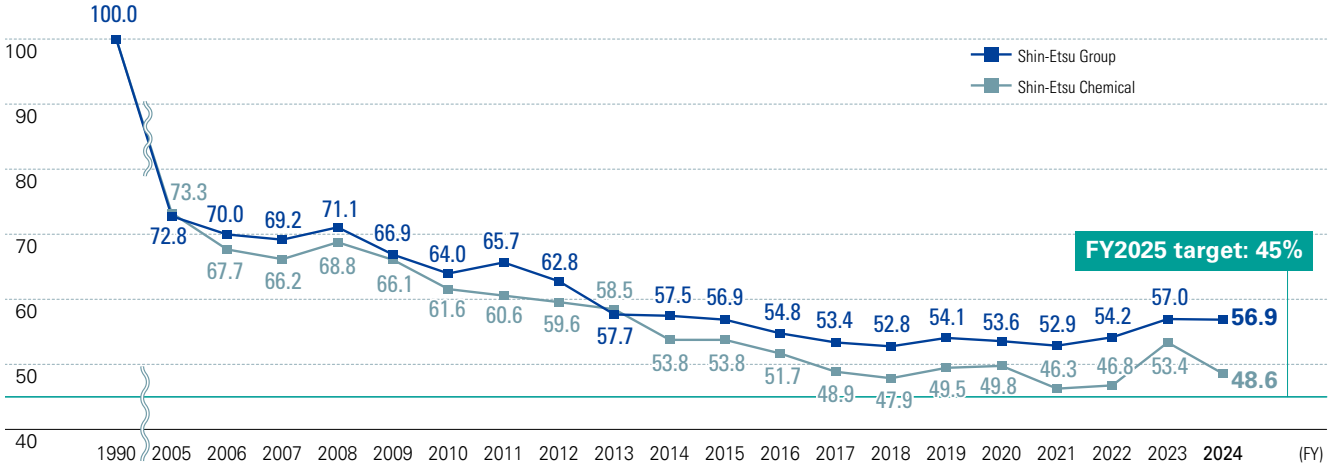
Scope 1 emissions were 2,326 thousand t-CO_2 (up 84 thousand t-CO_2 (3.7%) year on year) and Scope 2 emissions were 4,443 thousand t-CO_2 (up 140 thousand t-CO_2 (3.3%) year on year).

Greenhouse gas emissions by scope

The Group's Scope 3 greenhouse gas emissions*1 for FY2024 were 12,096 thousand t-CO_2, amounting to 64% 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.

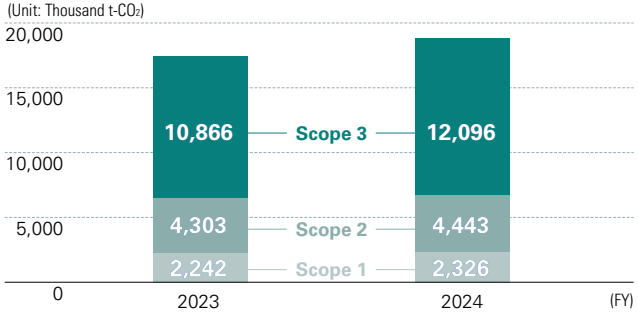
Changes in Greenhouse Gas Emissions in Terms of Production Intensity Relative to the FY1990 Level*



*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.

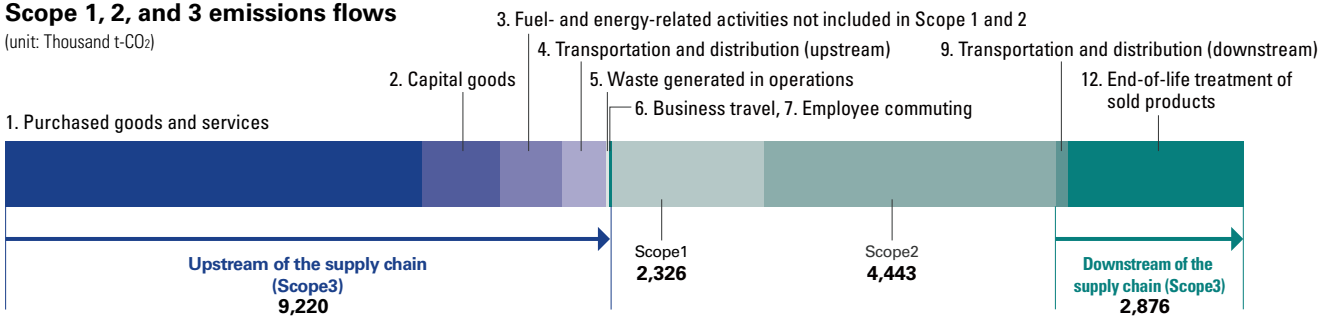
Greenhouse gas emissions by scope



(Note) Because the Shin-Etsu Group is working to calculate greenhouse gas emissions more precisely, Scope 2 emissions for FY2023 have been revised from the figure stated in the Annual Report 2024 (4,266 thousand t-CO_2).

Scope 1, 2, and 3 emissions flows

(unit: Thousand 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/

Natural Capital

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 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, which is attended by all directors, audit & supervisory board members, and corporate officers. Subsequently, the Task Force has been reporting on the Group's climate change-related initiatives at the Managing Directors' Meeting on an annual basis.

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 risks include transition risks such as increased spending due to CO_2 emissions trading and carbon taxes and rising manufacturing costs due to rising energy prices, as well as physical risks such as damage to equipment due to the wind disaster, damage to electrical equipment due to flooding, and plant shutdown resulting from such cases.

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 FY2024, Scope 1 emissions were 2,326 thousand t-CO_2 (up 84 thousand tons or 3.7% from the previous fiscal year) and Scope 2 emissions were 4,443 thousand t-CO_2 (up 140 thousand tons or 3.3% 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. FY2024 results were 56.9% (down 0.1 points year on year) compared to FY1990 for the Group and 48.6% (down 4.8 points year on year) compared to FY1990 for the Company. In FY2024, we continued to promote energy-saving activities at each of our business sites.

Natural Capital

Disclosure under the TCFD

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 window profiles resin windows because of its excellent heat insulation properties. Demand for PVC-framed 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 polyvinyl 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 electrical 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

Resource Saving

Resource Saving on our sustainability website
https://www.shinetsu.co.jp/en/sustainability/esg_environment/

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

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 proactively considering ways to recycle the solvents used in chemical reaction processes and create formulations that allow them to be reused.

Metrics and Targets

FY2024	
Targets	Achieve zero waste emissions.
	Promote the reduction of waste generation in terms of intensity.
Results	The final waste landfill disposal rate was 0.86% in Japan
Evaluation	The target was achieved in Japan
FY2025	
Targets	Achieve zero waste emissions.
	Promote the reduction of waste generation in terms of intensity.

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

Resource circulation

In terms of resource circulation, since 2007 we have been recycling magnetic powder generated from the processing of rare earth magnets. Furthermore, since March 2013, we have been improving the above recycling techniques to recycle rare earth magnets. PVC products in particular are increasingly being recycled because the impact of foreign matter contamination is small.

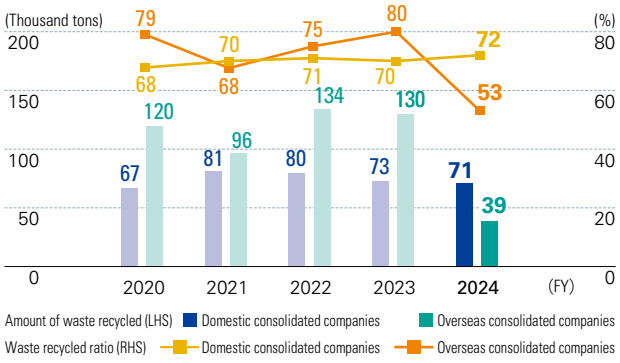
In FY2024, compared to FY2023, the amount of domestic waste generated decreased by 7 thousand tons (down 6.7% year on year), and the domestic recycling rate increased two percentage points year on year to 72%.

Reducing the weight of waste for disposal

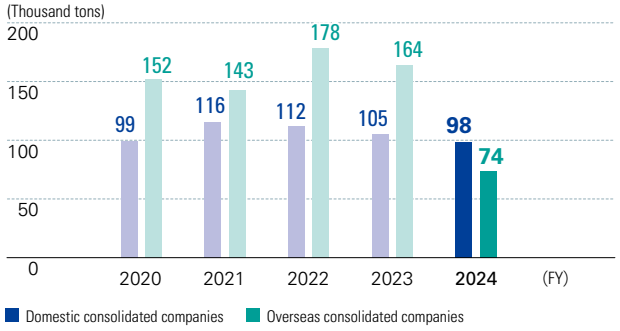
The plant's wastewater treatment facilities separate and dehydrate the inorganic solids contained in the wastewater to make a solid sludge. This sludge is treated as industrial waste by an external contractor and is put to effective use as roadbed material and the like. The Naoetsu Plant introduced a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

Dehydrator installed at Naoetsu Plant

Amount of waste recycled/Waste recycled ratio



Amount of waste generated



Natural Capital

Water Resource Conservation

Water Resource Conservation on our sustainability website
https://www.shinetsu.co.jp/en/sustainability/esg_environment/water/

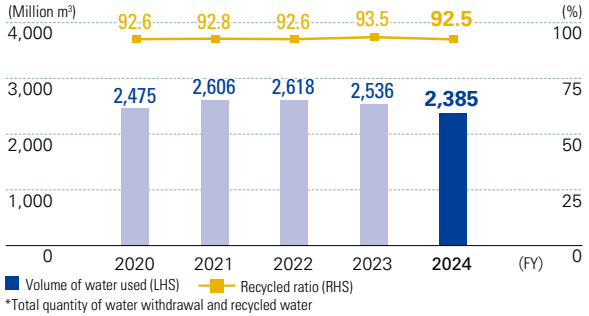
The Group, which has production bases in areas with abundant water and enjoys the benefits of water resources, is actively working to improve technologies for water resource conservation, such as reducing the amount of water withdrawal, ensuring that water is recycled, and implementing thorough wastewater purification and water quality management.

Metrics and Targets	
FY2024	
Targets	Reduce water withdrawal in terms of intensity at an average annual rate of 1%.
	Reduce water pollutant discharge in terms of intensity at an average annual rate of 1%.
Results	Intensity at the average annual rate from FY2021 to FY2024 was decreased by 7.9% in terms of water withdrawal and decreased by 8% in terms of BOD emission.
Evaluation	The targets were achieved.
FY2025	
Targets	Reduce water withdrawal in terms of intensity at an average annual rate of 1%.
	Reduce water pollutant discharge in terms of intensity at an average annual rate of 1%.

Water resource conservation

Water withdrawal and the average annual rate of water pollutant discharge expressed in terms of intensity were reduced from FY2021 to FY2024, achieving the targets that were set.

Water usage*/Recycled ratio (Consolidated)



*Total quantity of water withdrawal and recycled water

Effective use of water withdrawal and thorough water quality management

The Shin-Etsu Chemical Gunma Complex draws almost all of the water required for manufacturing from nearby rivers. The complex recycles and circulates such water inside the complex to reuse the water in its manufacturing and water-cooling processes. In addition, as a production base that is located upstream, the Gunma complex purifies the water before discharging it into the river. The Complex continually monitors the operating status of water treatment facilities and conducts regular water quality analysis of discharged water to verify that it is in strict compliance with high water quality standards.

Shin-Etsu Chemical Gunma Complex

Biodiversity and Pollutant Countermeasures

Biodiversity and Pollutant Countermeasures on our sustainability website
https://www.shinetsu.co.jp/en/sustainability/esg_environment/chemical/

The Group conducts its business activities in a way that takes into account global ecosystems. It also 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.

Metrics and targets (Prevention of air pollution)	
FY2024	
Targets	Reduce emissions of air pollutants in terms of intensity at an average annual rate of 1%.
Results	The annual average rate from FY2021 to FY2024 is an increase of 14.1% in Soot in terms of intensity, and an increase of 1.3% in SOx in terms of intensity.
Evaluation	The targets were not achieved.
FY2025	
Targets	Reduce emissions of air pollutants in terms of intensity at an average annual rate of 1%.

Biodiversity

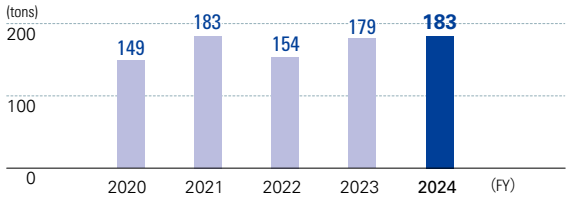
The Shin-Etsu Group aims to design eco-friendly products starting from the product development stage. As a chemical company, we are also working actively to ensure the strict control of chemical substances, mitigate global warming, reduce energy consumption, reduce the amount of waste generated, prevent air and water pollution, and make other environmental contributions. We are also actively engaged in activities such as tree planting at our plant sites in compliance with the Factory Location Act and river clean-up activities in areas around our plants.

Pollutant countermeasures

Now that the revised PRTR Law has come into force, silicon carbide and other substances have been identified as Class I designated chemical substances. In FY2023, the total amount of substances transferred under the PRTR system* increased, but in FY2024, the total amount was 2,727 tons, a decrease of 746 tons (down 21.5% year on year). Total emissions of substances subject to the PRTR system were 183 tons, an increase of 4 tons (up 2.2% year on year). Meanwhile, in FY2024, the Company performed groundwater and soil monitoring 260 times at its plant sites.

*Chemical substance release and transfer notification based on the "Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof"

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



*Figures are totals for Shin-Etsu Chemical and its 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.