

RC Report 2023



TechnoAmenity

Providing prosperity and comfort to people and society,
with our unique technology.

Values

> Respect Diversity

We will create new value by respecting the unique traits of each person.

> Pioneer New Possibilities

We will courageously provide solutions to customer challenges and social issues.

> Contribute to Global Environmental Preservation

We will work to ensure a better global environment is passed down to the next generation.

Safety Philosophy

Safety takes priority over production.

Code of Conduct

Every person working at the Nippon Shokubai Group will carry out business activities with commitment to the guiding principles below.

1 Realizing a sustainable society

We will contribute to the realization of a sustainable society by putting the Group Mission into practice.

2 Safety first

We will execute our business activities by always ensuring both internal and external safety.

3 Compliance

We will enforce thorough-going compliance in every area.

4 Respect for human rights

We will support international human rights standards and respect the human rights of all people touched by our business activities.

5 Fair and honest business dealings

We will engage in fair and sincere business activities with all of our stakeholders.

6 Providing value to our customers

We will provide materials and solutions needed by customers.

7 Preserving the environment

We will help reduce our environmental impact and help tackle environmental issues through technology.

8 Communicating with stakeholders

We will actively disseminate information and dialogue with stakeholders.

9 Promoting active participation of diverse human resources

We will recognize and respect diversity so that every person and organization reaches their full potential.

10 Contributing to local communities

We will contribute to the development of local communities as a member of those communities.

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On publishing the RC Report 2023

Nippon Shokubai's reports on Responsible Care (RC) initiatives began with the issuance of the "Environmental Report" in FY2002. Along with the improvement of the initiatives, the report name and contents have been changed as required. Starting from FY2019, in line with the publication of the TechnoAmenity Report to cover management strategies and financial data, in view of the importance of RC activities, we have issued a separate RC Report, which compiles information exclusively on our RC activities.

Under the principle of sustainable development, the Nippon Shokubai Group has designated environmental protection; process safety and disaster prevention; occupational safety and health; chemical safety; quality; and communication with society as the six priority areas of its RC activities, in which we are endeavoring to ensure the implementation of the activities. We enhance our activities based on our Safety Philosophy "Safety takes priority over production" and RC Policy, as well as the needs of society.

In particular, we began third-party verification of greenhouse gas emissions in Japan in FY2022, in response to increasingly apparent global climate change issues and Japan's moves to realize Green Transformation (GX). In February 2023, we acquired ISCC PLUS certification from the International Sustainability and Carbon Certification (ISCC), for the introduction of biomass-derived raw materials, and adopted internal carbon pricing as a criterion for investment decisions. In March 2023, in addition, we revised the TCFD Report, issued in April 2022 separately from this RC Report. Climate change issues are a major challenge that we need to tackle on a company-wide basis, and we will continue to actively address them from various perspectives, including RC.

I hope this Report will help deepen your understanding of the RC initiatives of our Group. We appreciate your support and candid opinions.

Gun Saito

Executive Officer, Director of RC Division



RC Initiatives

Nippon Shokubai proactively implements RC initiatives based on environmental protection, process safety and disaster prevention, occupational safety and health, chemical safety, quality, and communication with society.

RC Initiatives

Corporate members of the chemical industry that work with chemical substances undertake and publish the outcomes of voluntary initiatives to ensure excellence in environmental matters, safety, and health in all processes from the development to the manufacturing, distribution, and industrial and consumer use of chemical substances to their disposal and recycling in an effort to engage in dialogue and communication with society. The initiatives are collectively known as Responsible Care (RC), and have been promoted around the world since they were announced by the International Council of Chemical Associations (ICCA) in the RC Global Charter in 2006 and revised in 2014.

Nippon Shokubai is one of the charter members of the Japan Responsible Care Council (now known as the Responsible Care Committee of the Japan Chemical Industry Association [JCIA]) founded in 1995, and has since introduced and continues to promote efforts under several systems, including an environmental management system (ISO 14001), quality management systems (ISO 9001 and GMP*), and an occupational safety and health management system (OSHMS).

The Nippon Shokubai Group intends to continue to fulfill its corporate social responsibility by contributing to society through Groupwide RC activities.

* GMP: Good Manufacturing Practice



The Company President's signature on the RC Global Charter (2014 revised version)

RC Policy

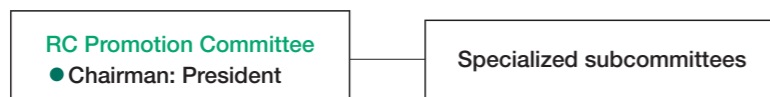
In order to achieve our Group Mission and put our Values, Code of Conduct, and Safety Philosophy into practice, the Nippon Shokubai Group takes the priority actions listed below with regard to the environment, safety, and quality. In doing so, we consider contributing to society by providing technologies and products that facilitate environmental protection to be a key management strategy; our actions are guided by the principle of Sustainable Development, and we work conscientiously to achieve harmony with environmental conservation on a global scale.

Our goal is for all Group employees to have an accurate understanding of this RC Policy, to be aware of its importance, and to put it into practice in all business activities. The Company President is the person with ultimate responsibility for putting the policy into practice.

- 1 We consider environmental impact and take steps toward environmental protection throughout the entire lifecycle of our products, from development to disposal.
- 2 We strive to ensure safety for our employees and society at large by striving to completely avoid accidents and injuries based on our Safety Philosophy of "Safety takes priority over production."
- 3 We consider the health of our employees, logistics partners, customers, and others by verifying the safety of the raw materials, intermediate goods, products, and other chemical substances we work with.
- 4 We consistently provide reliable, high-quality products and services that satisfy our customers.
- 5 We publish the outcomes of the aforementioned activities in an effort to ensure that our message is understood properly.

RC Promotion System

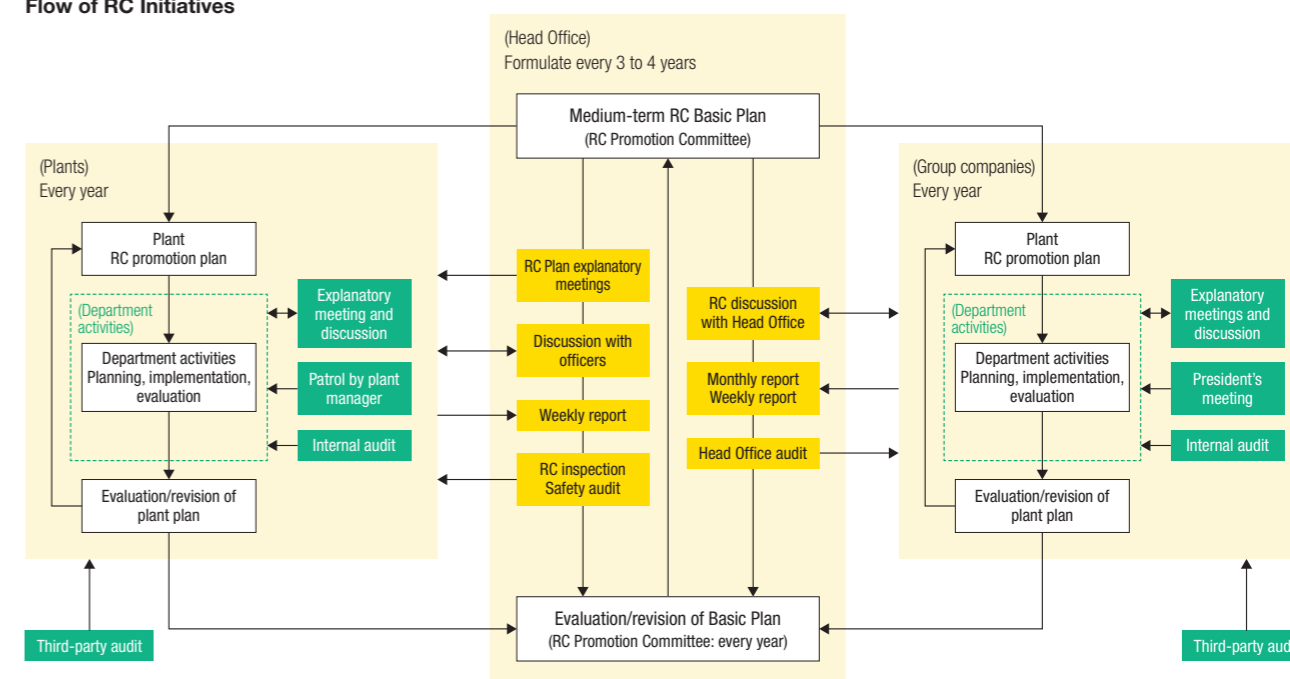
Our RC Promotion Committee chaired by the Company President reviews basic and overall matters to make concrete progress in implementing the RC Policy and guidelines set out in other company regulations in all activities: environmental protection, process safety and disaster prevention, occupational safety and health, chemical safety, quality, and communication with society. We have also established specialized subcommittees under the RC Promotion Committee to promote company-wide RC initiatives.



Promotion Cycle for RC Initiatives

To put the RC Policy into practice, the Nippon Shokubai Group makes efforts to contribute to society and fulfill its corporate social responsibility by undergoing the PDCA cycle each year within the promotion cycle for RC initiatives illustrated below.

Flow of RC Initiatives



Flow of Promotion Cycles

[Head Office]

Every three to four years, the RC Promotion Committee chaired by the Company President formulates a Medium-term RC Basic Plan to coincide with the duration of the company's medium-term management plan. Additionally, each year the council selects the focuses of inspections, conducts RC inspections and safety audits to check and evaluate the status of activity implementation at our plants, and revises plans as necessary.

[Plants]

Each year, the RC Committee at each plant chaired by the plant manager formulates a Plant RC promotion plan based on the Company-wide Medium-term RC Basic Plan and evaluations of the previous year's Plant RC promotion plan. Each department uses the RC promotion plan for their location as the basis for formulating and acting on a department activity plan that outlines specific activities to be implemented based on the challenges that department faces.

The progress of these activities is checked not only through plant manager patrols, discussions at departments, and internal audits of

ISO and other management systems, but also through discussions and RC inspections conducted by Head Office officers as well as third-party audits. In light of the results, department activity plans are revised as necessary to undergo the PDCA cycle in pursuit of continuous improvement.

[Group companies]

Like Nippon Shokubai, each year Group companies formulate plans based on the Medium-term RC Basic Plan; however, each formulates their own RC promotion plan in consideration of their business activities and the laws and regulations in their country.

They show the progress of their activities with the Head Office through weekly and other regularly scheduled reports and online meetings, and the Head Office also conducts regularly scheduled discussions and audits to check on the progress. In light of the results, the activities are revised as necessary to undergo the PDCA cycle in pursuit of continuous improvement.

The Head Office also encourages Group companies to interact with each other in an effort to enhance each other's activities.

Key Terminology

PDCA cycle: Plan-do-check-act cycle

A method of continuous improvement for quality control and other aspects of process technology. Operations are continuously improved by repeating the four steps: Plan, Do, Check, Act.

RC Inspections

We organized an RC Inspection Committee led by Company officers and chaired by the Member of the Board in charge of Production & Technology to conduct annual RC inspections in an effort to continuously improve RC initiatives at the Himeji and Kawasaki Plants.

What Are RC Inspections?

Our RC inspections date back 48 years to February 1974, soon after we established our Safety Philosophy of "Safety takes priority over production" in 1973.

We referred to them as "safety inspections" until 2003, and have continued conducting them in an effort to put our Safety Philosophy into practice. Now, we conduct them based on the key topics set out each fiscal year and the implementation status of RC initiatives at each plant. The following are the key topics for RC inspections over the past several years.

Medium-term Plan*	Fiscal year	Priority theme
10th FY2017 to FY2020	FY2017 (45th)	Initiatives for environmental protection
	FY2018 (46th)	Prevention of quality issues and ensuring quality governance
	FY2019 (47th)	Prevention of recurrence of similar industrial injuries
	FY2020 (48th)	Prevention of process safety accidents
FY2021	FY2021 (49th)	Chemical substance management
11th FY2022 to FY2024	FY2022 (50th)	Initiatives to foster a safety culture and revisions toward more effective safety activities

* The FY2021 plan is a single-year plan.

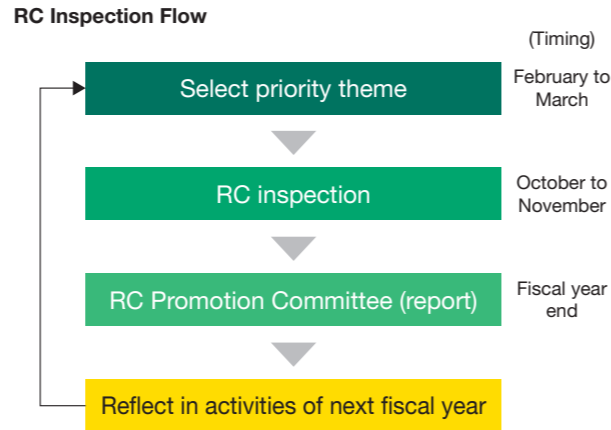
FY2022 RC Inspections

We conducted the RC inspection for FY2022 in person for the first time since FY2019, on October 13 for the Kawasaki Plant, and November 8 for the Himeji Plant, to check the implementation status of RC initiatives. The key topic was "fostering a safety culture and reviewing safety activities to make them more effective."

RC Inspection Procedure

RC inspections are conducted by the RC Inspection Committee from October to November each year after the key topic or topics for the year are selected from February to March of the previous fiscal year based on information such as problems outside the company and the results of internal RC initiatives. The results are reported to the plants as well as the RC Promotion Committee chaired by the Company President, and are reflected in the activities of the following fiscal year.

The diagram below shows the procedure of RC inspections.



We strive to continuously improve RC initiatives by sending reports containing concerns, suggestions for improvement, and other information to the plants.



RC inspection

The 11th (FY2022–FY2024) Medium-term RC Basic Plan and FY2022 Results

We formulated the 11th Medium-term RC Basic Plan, in which objectives and priority initiatives were set by reflecting ongoing activities from the 10th plan and the plan for FY2021, the results of analyzing the issues encountered, and external needs, including revisions to laws made in response to technological progress. By steadily implementing the 11th Medium-term RC Basic Plan and continuously making improvements, we will continue our safe and stable production activities and move toward the Goals for 2030, which have been set in our long-term vision "TechnoAmenity for the future."

[Ratings] 😊 Achieved 😊 Nearly achieved 😞 Unachieved

Environmental Protection

Objectives for FY2022–FY2024

- Energy saved: 6,000 kL (over 3 years)
- Energy consumption intensity: 5% reduction from FY2019 levels (annual reduction of 1%, 96.9 L/t-production)
- CO₂ emissions*1 for FY2030: 30% or greater reduction from FY2014 levels (including Group companies in Japan)
- Fuel consumption intensity for road transport: 4% reduction from FY2020 levels (annual reduction of 1%, 33.7 L/1,000 t-km)
- Promote modal shifts
- Water use intensity: reduction to at least FY2020 levels (8.45 m³/t-production)
- Maintain zero emissions*2: (Quantity of final off-site landfill) ≤ (Total amount of waste generated × 0.1%)
- Emissions of substances subject to the PRTR Law*3: 25% reduction from FY2015 levels (81 t/yr)*4

FY2022 Actual Figures

- Energy saved: 8,314 kL
- Energy consumption intensity: Increased 9.2%
- CO₂ emissions: Decreased 14.0%*5
- Fuel consumption intensity for road transport: Increased 1.4%
- Modal shift promotion ongoing
- Water use intensity: Increased 6.1% from FY2020 levels
- Zero emissions maintained
- Emissions of substances subject to the PRTR Law: Decreased 24.6%

Priority Initiatives

1. Promoted energy-saving activities and technical investigations to reduce emissions of waste/PRTR substances.
2. Promoted reduction in CO₂ emissions toward achieving carbon neutrality
3. Currently considering building a system that totals up product-specific CO₂ emissions
4. Ensured appropriate management of equipment that uses fluorocarbons and strove to control fluorocarbon emissions
5. Promoted certification of Environmental Contribution Products, including those manufactured by Group companies

Process Safety and Disaster Prevention

Objectives for FY2022–FY2024

- Zero Class A*6 or Class B*7 process safety accidents (aiming to completely avoid serious process safety accidents)

FY2022 Actual Figures

- Class A process safety accidents: 0
- Class B process safety accidents: 0

Priority Initiatives

1. Strove to strengthen the culture of prioritizing safety through monthly safety efforts, safety behavior checks, and more.
2. Implemented systematic risk assessment and other activities to prevent trouble.
3. Systematically implemented deterioration countermeasures, seismic countermeasures, and more.
4. Strove to continuously improve safety management systems.
5. Systematically implemented and enhanced training provided by outside entities and education/training/drills at plants and research centers.

Occupational Safety and Health

Objectives for FY2022–FY2024

- Zero injuries with loss of workdays*8 (including contractors)
- Zero injuries without loss of workdays*9 (including contractors)

FY2022 Actual Figures

- Injuries with loss of workdays: 2
- Injuries without loss of workdays: 5

Priority Initiatives

1. Promoted basic safety activities and implemented other activities to prevent troubles.
2. Implemented systematic safety measures through efforts such as persistently sharing cases of industrial injuries throughout the company.
3. Verified the status and strove for continuous improvement of various safety activities.
4. Systematically implemented workplace safety training and enhanced training/drills.
5. Supported contractors' safety activities through safety training, patrols, and more.

*1 The emissions reduction target is in fact for greenhouse gases (GHG), but most GHG is actually carbon dioxide (CO₂). Therefore, it is referred to as CO₂ here.

*2 Zero emissions: Reducing the quantity of waste subject to final disposal at off-site landfills to 0.1% or less of the total amount of waste generated

*3 PRTR Law: Act on the Assessment of Releases of Specified Chemical Substances in the Environment and the Promotion of Management Improvement

*4 Due to amendment of the PRTR Law, this objective is scheduled to be reviewed within the period of the 11th Medium-term RC Basic Plan.

*5 Including a carbon credit offset of 7.3% due to the purchase of carbon-neutral city gas

*6 Class A: Level 9 or higher according to the Nippon Shokubai method on the Japan Petrochemical Industry Association chart

*7 Class B: Level 3 to 8 according to the Nippon Shokubai method on the Japan Petrochemical Industry Association chart

*8 Injury with loss of workdays: Injury requiring at least one lost workday for medical treatment

*9 Injury without loss of workdays: Injury requiring no loss of workdays for medical treatment

Chemical Safety

Objectives for FY2022–FY2024

- Completely avoid (legal/social) problems with chemical products

FY2022 Actual Figures

- Cases involving problems with chemical products: 0

Priority Initiatives

1. Systematically conducted internal training and held explanatory meetings concerning laws and regulations for management of chemical substances both inside and outside of Japan.
2. Revised SDS on time in accordance with the requirements of relevant laws and regulations, including amendment to the PRTR Law.
3. Submitted notices and information before the prescribed deadlines based on legal obligations under domestic and foreign laws and regulations, and when requested by the authorities.

Quality

Objectives for FY2022–FY2024

- To achieve zero serious quality complaints
- To improve customer satisfaction by strictly complying with quality-related laws and promoting priority initiatives regarding quality

FY2022 Actual Figures

- Serious complaints about quality: 0
- Accomplished quality priority initiatives designed to improve customer satisfaction

Priority Initiatives

1. Continuously made improvements by effectively using the quality management system through audit, inspection, quality meetings, and the like.
2. Promoted activities to prevent quality complaints and issues, as planned.
3. Implemented quality education and quality awareness-raising activities to foster a quality-first mindset, as planned.

Communication with Society

Objectives for FY2022–FY2024

- Engage in dialogue with and disclose information to stakeholders

FY2022 Actual Figures

- Published the RC Report and published and revised the TCFD Report

Expanding RC initiatives to Group Companies (Common Items with Group Companies)

Objectives for FY2022–FY2024

1. Environmental protection:
 - Reduce energy consumption intensity
 - Set a CO₂*1 emissions reduction objective (Group companies outside Japan)
 - Reduce the volume of waste sent to off-site landfills for disposal (Group companies in Japan)
 - Reduce the total volume of waste (Group companies outside Japan)
 - Reduce emissions of substances subject to the PRTR Law (Group companies in Japan)
2. Process safety and disaster prevention:
 - Completely avoid disasters and accidents (equivalent to Class A and Class B process safety accidents on the Nippon Shokubai scale)
3. Occupational safety and health:
 - Completely avoid injuries with loss of workdays
4. Chemical product safety:
 - Completely avoid (legal or social) problems with chemical products
5. Quality:
 - Completely avoid serious complaints about quality
6. Communication with society:
 - Engage in dialogue with and properly disclose information to stakeholders

FY2022 Actual Figures

- Energy consumption intensity: Decreased at 7 out of 12 companies
- Volume of waste sent to off-site landfills for disposal: Decreased 31% YoY (Group companies in Japan)
- Volume of total waste: Increased 2.7% YoY (Group companies outside Japan)
- Emissions of substances subject to the PRTR Law: Decreased 12% YoY (Group companies in Japan)
- Disasters: 0
- Accidents: 0
- Injuries with loss of workdays: 4
- Cases involving problems with chemical products: 0
- Serious complaints about quality: 0
- Published environmental reports, and participated in local community events

Priority Initiatives

- Conducted RC discussions and audits of Group companies in an effort to improve the Group's overall quality of RC initiatives

Environmental Protection Initiatives

Nippon Shokubai promotes initiatives to reduce the environmental impact of our business operations, including tackling climate change and reducing waste through our product supply chains.

Overview of FY2022

Nippon Shokubai began third-party verification of greenhouse gas (GHG) emissions in Japan in FY2022. In addition, we have acquired ISCC PLUS certification from the International Sustainability and Carbon Certification (ISCC), for the introduction of biomass-derived raw materials, and adopted internal carbon pricing as a criterion for investment decisions. With regard to our efforts to reduce energy consumption, we conserved about 8,300 kL of energy (crude oil equivalent) through process improvement. However, energy consumption intensity deteriorated due to decreases in production volume of our major products. As for the reduction of emissions of substances subject to the PRTR Law, we were able to reduce their emissions more or less smoothly.

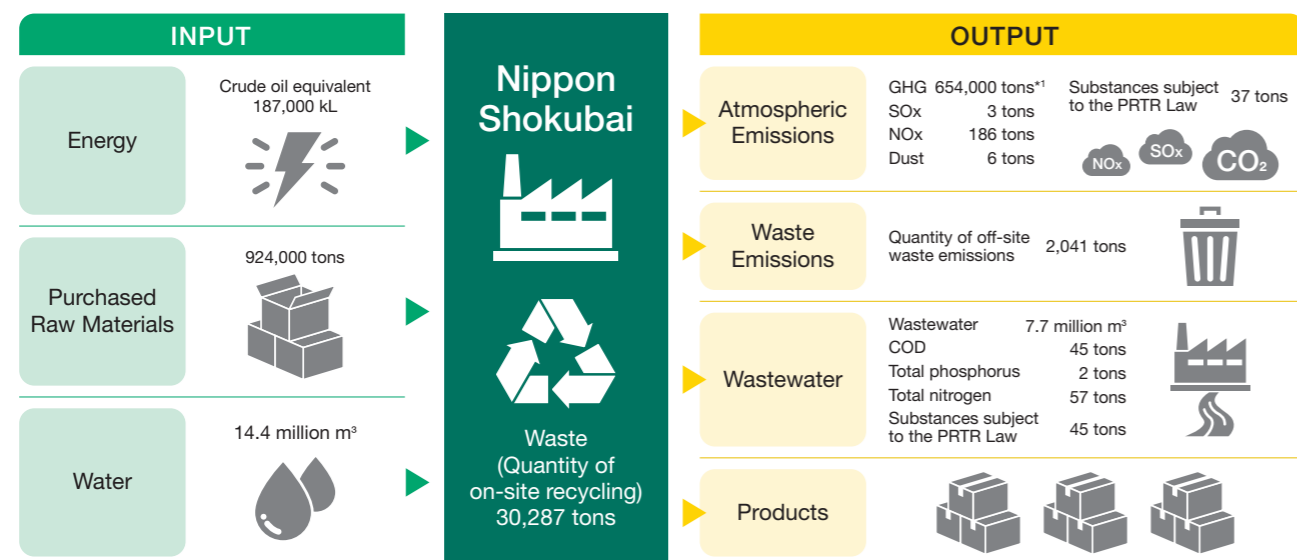
Environmental Protection Policy

We have set out the following Environmental Protection Policy based on the Group Mission “**TechnoAmenity** : Providing prosperity and comfort to people and society, with our unique technology.”

- Actively seek to improve energy efficiency, use renewable energy and bio-based raw materials, and engage in other efforts to reduce greenhouse gas emissions.
- Reduce emissions of waste and chemical substances and promote the recycling and the effective use of resources to contribute to the realization of a sound material-cycle society.
- Actively seek to develop and provide products and technologies that help reduce environmental impact.
- Seek to minimize the negative impacts of business activities on ecosystems in an effort to preserve biodiversity.
- Actively disclose and communicate information about environmental conservation to further mutual understanding with stakeholders.

Environmental Impact of Business Activities

In addition to striving to provide better products and services, we engage in various activities to reduce the environmental impact of our business activities, which we extend to include our supply chains. We recycle the water we use in our production locations to a high degree and thoroughly treat it before releasing it into the natural environment in an effort to effectively use water resources in addition to the obvious benefits of saving energy and combating climate change. Also, so that people in the vicinity of our production locations can live free of worry, we ask them to monitor the air for foul smells, and conduct odor patrols and measure noise ourselves on a regular basis. There were no environmental pollution incidents or complaints in FY2022.



Note: This fiscal 2022 data is for only Nippon Shokubai (including our head offices, research centers and other sites).
**1 Including a carbon credit offset of 61,000 tons of CO₂ emissions due to the purchase of carbon-neutral city gas

Tackling Climate Change

Promoting greenhouse gas (GHG) emissions reduction

▶ Formulating a roadmap for reducing GHG emissions

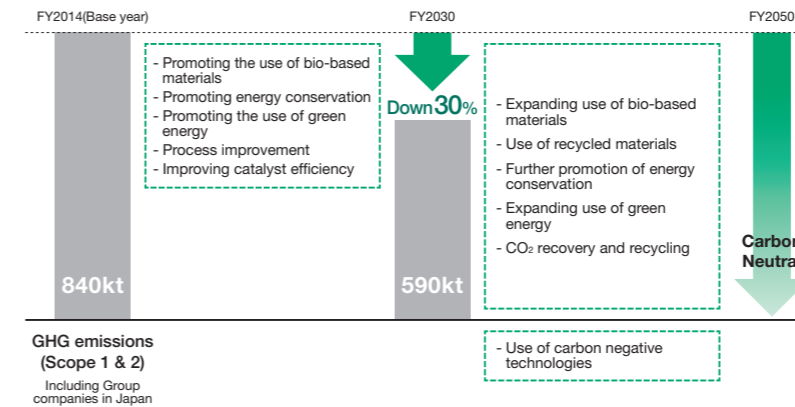
Nippon Shokubai formulated a roadmap for reducing GHG emissions by 2050 in terms of the “strategic transformation for environmental initiatives,” one of the “three transformations” set out in “TechnoAmenity for the future,” the Nippon Shokubai Group long-term vision published in April 2021.

Regarding our GHG emissions reduction target for FY2030, the final year of our long-term vision, we set a target of reducing our GHG emissions in Japan, which constitute roughly 70% of Group-

wide emissions, by at least 30% from FY2014 levels by FY2030.

In FY2022, we started to buy carbon-neutral city gas. In FY2022, our GHG emissions in Japan, including those offset by the purchase of carbon-neutral city gas, amounted to 720,000 t-CO₂e,*1 a 14%*1 reduction from FY2014 levels. We are currently considering setting targets for GHG emission reductions at Group companies outside Japan.

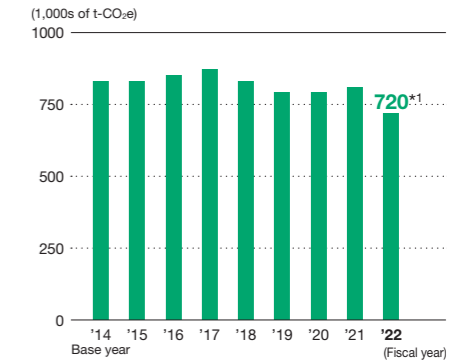
Roadmap for Reducing GHG Emissions by 2050



Note: We partly changed the aggregation method of GHG emissions.

*1 Including a carbon credit offset of 61,000 tons of CO₂ emissions (7.3% reduction from the FY2014 level) due to the purchase of carbon-neutral city gas

Trend in GHG Emissions (in Japan)



Employee's Voice

Realizing heat recovery in various operation conditions

The Kawasaki Plant has introduced a co-generation system, which effectively uses the heat generated at the plant to heat the steam generated at the ethylene oxide (EO) plant, thereby enabling highly efficient use of energy from the entire plant. Depending upon the operation conditions of the plant, however, it was difficult to use the generated heat.

In response, I proposed remodeling plant facilities so that the generated heat can be used effectively under a wide range of operation conditions. This idea of remodeling, which affects the basis of the EO plant, was considered from various angles, including risk management, with the cooperation of the technical department and the engineering department. Under circumstances where any mistakes or trial and error would be unacceptable, we were able to remodel the facilities, although we had difficulties stabilizing the steam temperature and reducing remodeling costs. Thanks to this effort, we were able to conserve about 3,000 kL of energy (crude oil equivalent) in FY2022.

We will continue to promote energy conservation activities by taking advantage of DX, while pursuing safe and stable production activities.



Kodai Naruse
Production No. 1 Section, Kawasaki Plant

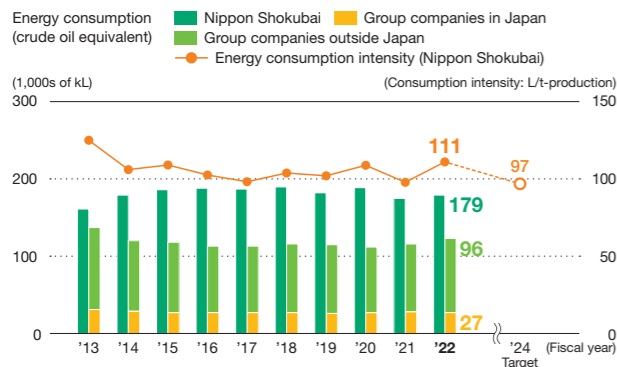
Environmental Protection Initiatives

▶ Reducing energy consumption and CO₂ emissions

Our RC Promotion Committee, which is chaired by the Company President, formulated a Medium-Term RC Basic Plan based on the targets set out in JCI's action plan for achieving a low carbon society. On the basis of this plan, each of our plants takes action to mitigate climate change under the leadership of the committees responsible for promoting energy conservation activities and a reduction in CO₂ emissions.

In FY2022, despite the progress of energy conservation activities, energy consumption intensity changed for the worse due to a decline

Trends in Energy Consumption and Energy Consumption Intensity

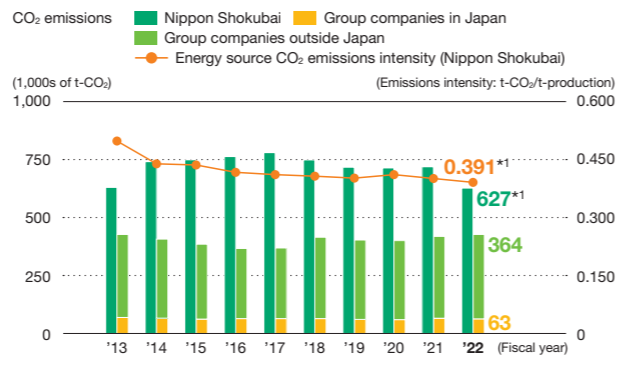


Note: Figures for neither energy consumption nor CO₂ emissions include those from the Head Offices, Research Centers, plant management buildings, or welfare facilities.
 Note: In FY2022, energy consumption and CO₂ emissions for the Nippon Shokubai Head Offices, Research Centers, plant management buildings, and welfare facilities were 8,000 kL and 11,000 tons (including the emissions offset by buying carbon-neutral city gas), respectively.

in the production volume of energy generation products. In addition, a decrease in production volume contributed to the worsening of CO₂ emission intensity, but CO₂ emissions were reduced partly due to the use of carbon-neutral city gas.

In FY2021, we started solar power generation (on-site PPA) at the Himeji Plant. In addition, we promote energy conservation activities through the collection of waste heat and the introduction of a co-generation system. We also collect part of the CO₂ generated in the manufacturing process and sell it as liquefied carbon dioxide to reduce CO₂ emissions.

Trends in CO₂ Emissions and Intensity



Note: Figures for CO₂ emissions are totals of energy-derived and non-energy-derived CO₂ emissions.
 Note: We have changed the aggregation method.
 *1 Including the emissions offset by buying carbon-neutral city gas

▶ Fluorocarbon emission control

The Act on Rational Use and Proper Management of Fluorocarbons, which covers the entire lifecycle of fluorocarbons from production to disposal, went into effect in April 2015, and regulations for disposing of certain equipment were further tightened in April 2020.

As a manager of Class I specified products, the Company conducts the legally mandated simple inspections and routine inspections according to plans. Additionally, our calculations of leaked fluorocarbons in FY2022 revealed leakage of 112 t-CO₂e from the Himeji Plant, 5,135 t-CO₂e from the Kawasaki Plant, and 5,255 t-CO₂e Company-wide. We intend to make efforts to reduce leaked fluorocarbons—an activity that facilitates climate change mitigation—by intensifying inspections and maintenance, upgrading to equipment that uses coolants with low global warming and ozone depletion potential, and properly disposing of equipment.

Calculations of Leaked Fluorocarbons in FY2022

	(t-CO ₂ e)
Himeji Plant	112
Kawasaki Plant	5,135
Others	8
Entire company	5,255

Topics \ Adoption of Internal Carbon Pricing

On February 1, 2023, the Nippon Shokubai Group adopted internal carbon pricing (ICP*) to promote low carbonization and decarbonization in corporate management.

*ICP: A tool for creating economic incentives to reduce emissions and save energy, promoting low-carbon investment and encouraging climate change response by setting a company's own carbon price to calculate the cost of CO₂ emissions.

ICP of the Nippon Shokubai Group

- ICP: ¥10,000/t-CO₂
- Method of application: The costs will be calculated using ICP based on a change in CO₂ emissions, and will be used as a criterion for investment decisions.

To realize its Mission "TechnoAmenity," the Nippon Shokubai Group is promoting the three transformations set forth in its long-term vision "TechnoAmenity for the future": "Business Transformation," "Strategic Transformation for Environmental Initiatives," and "Organizational Transformation."

We will accelerate "Strategic Transformation for Environmental Initiatives" by raising awareness of the Group's commitment to decarbonization, promoting energy conservation, and activating discussion about opportunities and risks concerning CO₂ emission reductions.

Calculating GHG emissions throughout supply chains

▶ Calculating Scope 3 emissions

The GHG Protocol classifies GHG emissions into three classes: Scope 1, Scope 2, and Scope 3, which are the total GHG emissions attributable to business activities throughout supply chains for all categories.

- Scope 1 Direct emissions:** Direct GHG emissions by the reporting company itself (eg. fuel combustion, industrial process)
- Scope 2 Indirect emissions:** Indirect emissions from the use of electricity, heat, or steam supplied by others
- Scope 3 Other indirect emissions:** Indirect emissions other than Scope 1 and Scope 2 (emissions by others related to the company's activities)

Nippon Shokubai will continue to calculate Scope 3 emissions and explore the possibility of reducing CO₂ emissions resulting from all corporate activities.

Trends in Scope 3 Emissions (Data for Nippon Shokubai alone)

No.	Category	Emissions (1,000 t-CO ₂ e)		
		FY2020	FY2021	FY2022
1	Purchased goods and services	1,445	1,522	1,370
2	Capital goods	55	44	43
3	Fuel- and energy-related activities not included in Scope 1 or Scope 2	85	83	89
4	Upstream transportation and distribution	14	15	13
5	Waste generated in operations	7	8	5
6	Business travel	0.3	0.3	0.3
7	Employee commuting	0.9	0.9	0.9
12	End-of-life treatment of sold products	1,961	2,111	1,884
Total		3,567	3,783	3,405

Note: We partly changed the extent of calculation.

Efforts for Eco-Friendly Logistics

Promoting White Logistics to reduce environmental impact

To tackle climate change and prevent air pollution in logistics, we are making efforts to reduce fuel consumption intensity and CO₂ emission intensity and undertaking emissions countermeasures.

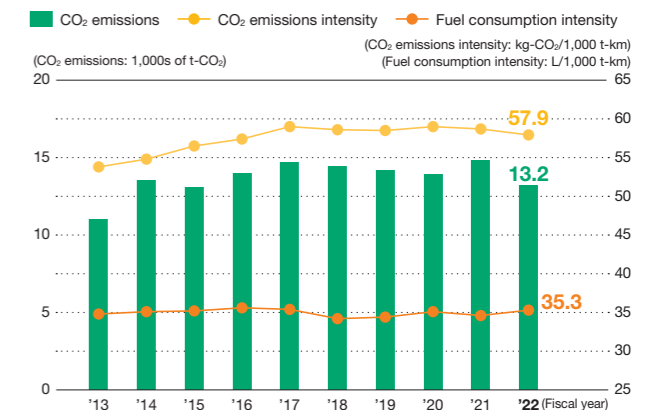
Although changes in traffic volume and the means of transportation resulting from economic conditions impact fuel consumption intensity and CO₂ emission intensity, we are deploying four measures to reduce CO₂ emission intensity: promoting modal shifts, improving transport efficiency, using digital tachographs linked to vehicle GPS and dashboard cameras, and saving energy in operations through efforts such as fitting vehicles with eco tires and switching engines off when vehicles are not in use.

As part of efforts to prevent air pollution, we are implementing three measures: eco-driving and displays indicating our commitment to eco-driving (eco-driving decals), avoiding the use of vehicles that do not satisfy the requirements of the Automotive NOx and PM Act, and proactively using low-pollution, fuel-efficient vehicles.

Also, given the increasing severity of the truck driver shortage in the logistics industry, we embrace and are working to promote the White Logistics movement that aims to realize more sustainable logistics. We are working to improve loading and unloading, streamline transport—for example shifting from long-distance trucking to roll-on/roll-off ship and railway transport and joint transport with competitors—and promote other efforts to improve productivity and create better working environments for women and older truck drivers.

Furthermore, we believe this movement concurrently helps reduce environmental impact.

Trends in Fuel Consumption Intensity and CO₂ Emissions/CO₂ Emission Intensity in Domestic Logistics



Example of a modal shift: Railway tank containers and loading and refilling facilities

Key Terminology

Modal shift

Changing the mode of transport to mass transport modes such as railways or ships in an effort to streamline transport while also saving energy and reducing environmental impact.

Roll-on/roll-off ship

A ship that transports loaded trucks and flatbeds.

Ton-kilometer

In transport, a ton-kilometer (t-km) is a unit of work that expresses the volume of freight transport in which the weight of transported freight in tons is multiplied by the distance the freight is transported in kilometers. As such, it is an accurate measure of transport as an economic activity.

Environmental Protection Initiatives

Topics **ISCC PLUS certification acquired for various products, including acrylic acid, superabsorbent polymers, and ethylene oxide** **– To promote the use of biomass as raw materials for disposable diapers, detergents, and other products –**

In February 2023, Nippon Shokubai obtained ISCC PLUS certification*1 for 19 products, including acrylic acid, superabsorbent polymers (SAP), and ethylene oxide manufactured at its Himeji Plant and Kawasaki Plant.

The certification enables us to establish a system to manufacture and market certified products which use biomass-derived raw materials allocated by the mass balance method,*2 and to offer a wider variety of products with low environmental impact. Our Group company in Belgium already acquired this certification in May 2021.

The Nippon Shokubai Group has established a global supply system for SAP (a water-absorbent material for disposable diapers) and acrylic acid (a raw material for SAP), and has the largest production capacity in Japan for ethylene oxide (a raw material for polyester fiber and detergents). As a responsible supplier of these products, in addition to the above initiatives, Nippon Shokubai is also working on the development of a new acrylic acid manufacturing process using 100% biomass derived from natural products, and on joint studies with other companies for manufacturing and marketing ethylene oxide derivatives using biomass raw materials.

Aiming to achieve carbon neutrality by 2050, the Nippon Shokubai Group will implement the Strategic Transformation for Environment Initiatives as outlined in the Group's long-term vision and medium-term management plan. One of the initiatives is to promote the use of bio-based materials. As part of such efforts, we have acquired this ISCC PLUS certification. We are planning to gradually introduce biomass-derived raw materials. For the time being, however, it is required to employ the mass balance method that mixes biomass-derived raw materials with petroleum-derived raw materials. We will continue to pursue "transformation," thereby contributing to increasing customer value and realizing a sustainable society.

The Nippon Shokubai Group is committed to and declares its compliance with the ISCC PLUS requirements in accordance with the latest ISCC regulations.

*1 ISCC (International Sustainability and Carbon Certification): A globally applicable certification system encompassing sustainability and carbon ISCC PLUS certification: a certification system that, across the supply chain, manages and guarantees biomass and renewable materials and products manufactured and sold around the world

*2 Mass balance method: When biomass-derived raw materials and petroleum-derived raw materials are mixed to create raw materials that are used for production, the ratio of the biomass-derived raw materials used is assigned as the biomass ratio of a specific end product. The method has been authorized by the ISCC PLUS system.

ISCC PLUS Certified Products

Product name	Production locations	Main applications
Acrylic Acid	Himeji	Acrylic esters, Superabsorbent polymers, Fiber modifiers, Flocculants
Superabsorbent Polymers (AQUALIC CA™)	Himeji	Disposable diapers, Sanitary pads, Pet sheets
Acrylic Esters	Himeji	Raw materials for adhesives and paints, For use in molding resin copolymerization, Acrylic fibers, Acrylic rubber
Acrylic Acid Special Esters	Himeji	Paints and coatings, Adhesives and pressure-sensitive adhesives, Printing ink, Photosensitive resins
	Kawasaki	Paints, Adhesives and pressure sensitive adhesives, Fiber treatment, Improving agent for copolymers, Photosensitive resins
Methacrylic Acid Special Esters	Himeji	Paints and coatings, Adhesives and pressure-sensitive adhesives, Printing ink, Photosensitive resins
Ethylene Oxide	Kawasaki	Ethylene glycol, Ethanolamine, Raw materials for organic synthesis such as alcohol ethoxylates, Surfactants
Ethylene Glycol	Kawasaki	PET resins, Polyester fibers, Antifreeze, Unsaturated polyester, Polyurethane, Softeners for cellophane, Synthetic resins
Ethanolamine	Kawasaki	Synthetic detergents, Gas absorbents, Metal corrosion inhibitors, Detergents for electronic materials, Waxes
Secondary Alcohol Ethoxylates (SOFTANOL™)	Kawasaki	Surfactants, Detergents for household use, Shampoos, Various industrial detergents, Scouring agents
Polycarboxylates (AQUALIC™ L)	Himeji Kawasaki	Raw materials for detergents
Polyethyleneimine Ethoxylate	Kawasaki	Raw materials for detergents, Papermaking agents (deinking, pitch control), Pigment dispersants, Water treatment agents (scale inhibitors), Abrasive grains dispersants, Plating additives

Development and Expansion of Environmental Contribution Products

Environmental Contribution Products

To produce chemical and industrial products, we use natural resources, emit CO₂, and generate waste, all of which impact the environment. However, considering the entire lifecycle of products from raw material extraction to final product disposal, there are cases where the presence of these chemical and industrial products helps reduce the environmental impact.

The Nippon Shokubai Group's products are used throughout supply chains as well as in everyday products, the equipment used to produce those products, infrastructure, and elsewhere. Thus, we evaluate how our products contribute to reducing environmental impact.

Our internal certification committee examines checklists, numerical data, and other information to certify Environmental Contribution Products. In FY2022, we started to conduct a third-party review prior to examination by the internal certification committee, and to reflect the views and advice obtained from the review in examination materials. Five products were newly certified in FY2022.



IONEL™
(Lithium-ion battery materials)



EPOMIN™
(Water treatment agents)



VEEA™
(UV-curable reactive diluent)



Waste gas treatment catalyst

Environmental Contribution Products

Types of contribution	Product life stage	Application	Certified product	
Preventing global warming/conserving energy	Reducing GHG	Manufacturing	Binding agent for fish feed in aquaculture	AQUALIC™ H (for feed)
			Concrete admixture	AQUALOC™
			Multifunctional hydrophilic treatment agent for synthetic fibers	PET-4G (product using recycled PET) [SINO-JAPAN CHEMICAL CO., LTD.]*
		Use	Material for rechargeable lithium-ion batteries	IONEL™
			Solid-state battery materials	ICPDAP™, ICPSEB™
			CO ₂ absorbent	Aminoalcohol (for absorbent) [NIPPON NYUKAZAI CO., LTD.]*
	Energy conservation	Manufacturing	FO (forward osmosis) system components for seawater desalination	Draw solute
			Paint, adhesive materials, and reactive diluent	Isobornyl acrylate
		Use	Paint and adhesive materials	Ethyl acrylate
			UV-curable reactive diluent	VEEA™
Reducing chemical emissions/preserving air quality	Reducing chemical emissions	Use	Water-based paint	UWR™/ACRYSET™ (for water-based paint)
			Emulsifier for emulsion polymerization for water-based paints	NEWCOL™ (for emulsion polymerization) [NIPPON NYUKAZAI CO., LTD.]* Reactive surfactant (for emulsion polymerization) [SINO-JAPAN CHEMICAL CO., LTD.]*
		Water-based adhesives	EPOCROS™	
		UV-curable paints	AOMA™	
	Preventing air pollution	Use	Removing hydrocarbons (HC), NO _x , dioxins, and other pollutants from exhaust gas	Automotive catalysts Waste gas treatment catalysts Denitrification catalysts and equipment Dioxin decomposition catalysts and equipment
			Oxidizing/decomposing hazardous substances in wastewater	Wastewater treatment catalysts for catalytic wet air oxidation
			Water treatment agents	EPOMIN™
			Polymer flocculants	Aminoalcohol (for flocculants) [NIPPON NYUKAZAI CO., LTD.]*
Conserving water resources/water quality/biodiversity	Preventing water pollution	Detergent builders	AQUALIC™ L (for detergent)	
		Detergent ingredients	SOFTANOL™ HIDS™	
	Biodegradability	Disposal	Detergent ingredients	SOFTANOL™ HIDS™
Reducing resource consumption	Reducing resource consumption	Use	Hollow fiber membranes	Polyvinylpyrrolidone
Reducing waste	Reducing waste	Disposal	Concrete admixtures	AQUAGUARD™

* A product of our Group company

Environmental Protection Initiatives

Promoting the reduction of CO₂ emissions throughout the entire lifecycle of products

We use the cLCA method to evaluate the best of our Environmental Contribution Products in terms of their contributions to reducing CO₂ emissions.

The cLCA method is an evaluation method for calculating net contributions to CO₂ emissions reduction; specifically, the difference

between CO₂ emissions throughout the lifecycle of a chemical product-based finished product and those of the finished product based on comparable products is considered to be the amount of additional emissions of the finished product if the constituent chemical product were not used.

Products expected to contribute to reducing CO ₂ emissions		Assessment prerequisites
AQUAGUARD™	Calculation of CO ₂ emissions avoided in one year when all apartments are built as long-lasting structures 4.05 million tons	We developed AQUAGUARD™ to limit cracking in concrete. Combining AQUAGUARD™ with high-performance AE water reducer should substantially prolong the useful lives of concrete structures. Service life: Assumed to be 100 years for long-lasting public housing and 50 years for ordinary public housing. CO ₂ emissions associated with the manufacturing, use, and demolition of public housing evaluated based on the LCA Guidelines for Buildings issued by the Architectural Institute of Japan.
ACRYSET™ (for damping materials)	Calculation of CO ₂ emissions avoided when an application-type vibration-damping material is installed in all automobiles manufactured in one year 310,000 tons	We developed an emulsion for vibration-damping coating to be applied to the lower surface of a vehicle body to suppress vibrations and noise from engines and road surfaces. Using vibration-damping coating should make automobiles lighter and conserve fuel. Vehicles to be driven 10,000 km per year for 10 years. Compared to vehicles with asphalt sheet as the vibration-damping material.
ZIRCOSTAR™	Calculation of CO ₂ emissions avoided when ZIRCOSTAR™ is incorporated in all smartphones manufactured in one year 220,000 tons	With its high optical properties, this product can be used as an optical material for plastic lenses, displays, and other components of mobile phones and smartphones, helping conserve the energy consumed by the displays of the devices and lengthen the battery life. According to the usage time described in the Carbon Footprint Product Category Rules, the product was evaluated as being in use for two years. A smartphone incorporating ZIRCOSTAR™ in the optical material was evaluated as achieving a 3.6% reduction in power consumption as an energy-efficiency benefit.
VEEA™	Calculation of CO ₂ emissions avoided by reduction expected from all the UV curable inks produced in one year 330,000 tons	Using VEEA™ as a UV-curing reactive diluent in eco-friendly ink removes the need to use volatile solvents and the equipment associated with them, saving energy and improving productivity. 3.2 g of ink per m ² of full-size A-series paper (880 x 625 mm) on a four-color printer. Commercial offset and commercial UV printing presses were compared for evaluation.
IONEL™ ICPDAP™ ICPSEB™ Electrolyte sheets for solid oxide fuel cells	(1) Calculation of CO ₂ emissions avoided when solid batteries are utilized as a regulated power supply for the use of renewable-energy-derived electricity supplied in one year (not including electricity for electric vehicles and the like) (2) Calculation of CO ₂ emissions avoided from the use of fuel cells Total: 5.96 million tons	IONEL™ and ICPDAP™/ICPSEB™ are used in storage batteries, which are expected to be used as regulating power sources to boost solar and wind power, which are the main sources of renewable energy but are characterized by widely fluctuating output. Additionally, solid oxide fuel cells are highly efficient at supplying power and heating water, contributing to reducing CO ₂ emissions. Due to the inability to forecast the supply of hydrogen, the CO ₂ reduction from using fuel cells is based on household fuel cells that generate electricity by modifying municipal gas. Compared to thermal power generation.
Aminoalcohol (for absorbent) (Nippon Nyukazai Co., Ltd.)*	Calculation of CO ₂ emissions avoided in one year when the CO ₂ emitted from thermal power plants is collected and stored using a chemical absorption technique 5.5 million tons	While renewable energy is increasingly being used, thermal power plants continue to operate to achieve stable power supply. Aminoalcohol contributes to CO ₂ emissions reduction because this product is used when these power plants trap CO ₂ from waste gas through a chemical absorption technique. Aminoalcohol was used as an absorbing solution when CO ₂ was separated and collected, and the amount of energy required mainly for the separation and collection was evaluated. The comparison target was CO ₂ emissions without the separation or collection.

Note: The assumptions above are expected values and do not guarantee actual service lives or performance.
* A product of our Group company

Chemical Substance Control

Reducing chemical substance emissions

Since FY1995, we have participated in the voluntary PRTR investigations conducted by the JCIA in an effort to reduce emissions of chemical substances into the environment.

Our emissions of PRTR substances in FY2022 was 81 tons, a

24.6% reduction from the level in FY2015.

We will continue to strive to systematically reduce chemical substance emissions toward the FY2024 objective of 25% reduction from the level in FY2015.

FY2022 Emissions of PRTR Substances (Top 10 Substances)

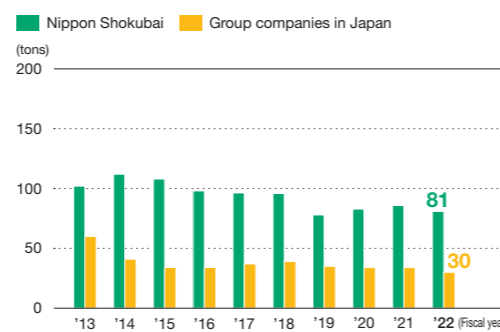
No.	Cabinet order No.	Name of PRTR substance	Air emissions	Discharge into water areas	Total	Movement
1	405	Boron compounds	0.0	28.9	28.9	0.2
2	321	Vanadium compounds	0.0	12.7	12.7	0.1
3	4	Acrylic acid and its water-soluble salts	7.7	0.0	7.7	0.0
4	56	Ethylene oxide	6.2	0.0	6.2	0.0
5	12	Acetaldehyde	5.9	0.0	5.9	0.0
6	80	Xylene	3.7	0.0	3.7	6.4
7	300	Toluene	2.8	0.0	2.8	393.2
8	58	Ethylene glycol monomethyl ether	2.2	0.0	2.2	0.0
9	7	Butyl acrylate	2.0	0.0	2.0	0.0
10	20	2-Aminoethanol	0.1	1.7	1.8	0.0

Key Terminology

Pollutant Release and Transfer Register (PRTR)

A system for registering the discharge and movement of pollutants. Under the system, operators report the release of chemical substances into the air, water, and soil and transfer of waste to government agencies that gather, organize, and publish the data.

Trends in Emissions of PRTR Substances



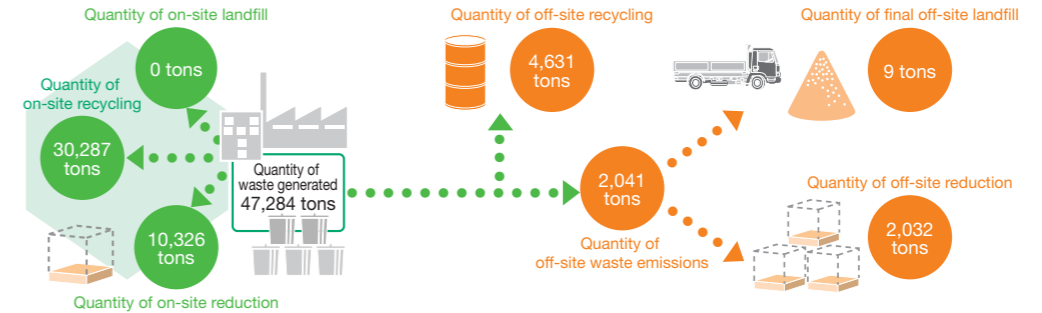
Waste Reduction

Reducing the volume of waste sent to off-site landfills for disposal

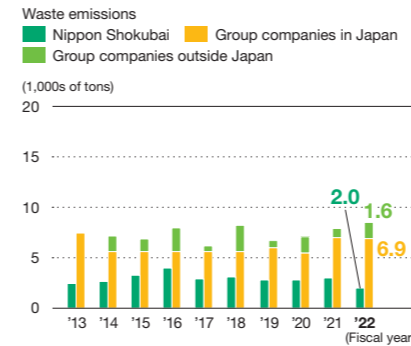
Promoting waste reduction is vital among efforts to form a sound material-cycle society. Nippon Shokubai sorts, collects, and recycles waste in addition to making other efforts consistent with our goal of achieving and maintaining zero emissions (volume of waste sent to off-site landfills for disposal is 0.1% or less of the total volume of waste).

In FY2022, in addition to continuing to rigorously sort and collect and promote recycling, we reduced the volume of waste sent to off-site landfills for disposal and maintained zero emissions by improving processes such that they produce less waste, reusing by-products, and treating product residues on-site.

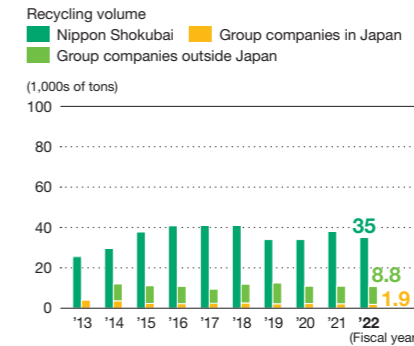
Diagram of Waste Treatment



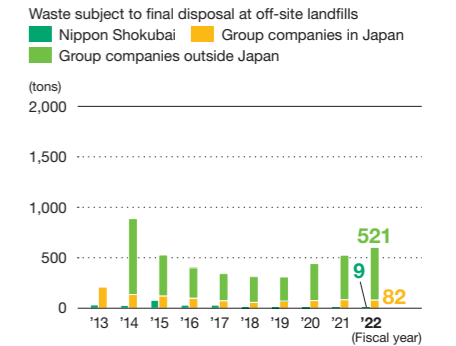
Trends in the Volume of Waste Generated



Trends in the Volume of Recycling



Trends in the Volume of Waste Sent to Off-site Landfills for Disposal



Employee's Voice

CO₂ emissions eliminated by reducing the amount of wastewater

Superabsorbent polymers (SAP) are made from polymerized acrylic acid (AA) and other raw materials that are crushed and dried. Since the waste gases emitted during the process of drying contain traces of AA that did not polymerize, AA is removed by contact with recycling water in a waste gas washing tower, and wastewater that has absorbed AA is burned in the disposal facilities of the plant.

In the Himeji Plant, the operation of old-type SAP production facilities with low production efficiency has been terminated one by one to be replaced with facilities with high production efficiency. Although the amount of waste gases can be reduced by stopping the operation of those old-type facilities, the amount of wastewater cannot be reduced simply in proportion to the amount of waste gases.

If the amount of wastewater extracted from the waste gas washing tower is reduced to decrease the amount of wastewater generated by the tower, the wastewater containing AA will increase in concentration and its retention time will be longer, thereby bringing about the generation of gel and making it difficult to treat wastewater in a normal manner.

To address this issue, I collected detailed data on the concentration of AA and its retention time in the waste gas washing tower and considered how the operation of the tower could be optimized. As a result, I was able to establish the operation requirements for reducing the amount of wastewater in the tower, contributing to a reduction of about 120 tons of CO₂ emissions per year.



Makoto Saito
Superabsorbents Production Department
Himeji Plant

Environmental Protection Initiatives

Air Pollution Prevention

Efforts to reduce environmental impact by introducing catalysts for treating exhaust gas

We are making efforts to reduce emissions of SOx, NOx, and dust to prevent air pollution. We ascertained the emissions of the respective substances, and installed proprietary De-NOx equipment and scrubbers to reduce NOx and dust, respectively, and reduced fuel oil consumption and shifted to natural gas to reduce SOx. We also use proprietary catalysts for treating exhaust gas to purify unutilized materials and other emissions from our manufacturing processes.

None of our emissions exceed the values we agreed upon with the municipal and prefectural governments.

Trends in Emissions

		'17	'18	'19	'20	'21	'22
SOx emissions	Nippon Shokubai	2.8	3.5	3.5	3.7	3.1	3.0
	Group Companies in Japan	1.5	1.6	1.4	1.6	1.4	0.7
NOx emissions	Nippon Shokubai	204	198	203	198	196	186
	Group Companies in Japan	48	45	43	48	72	52
Dust emissions	Nippon Shokubai	6.4	6.3	6.5	5.7	7.4	6.0
	Group Companies in Japan	2.3	2.2	3.3	2.1	2.1	1.9

(tons)

Water Resource Conservation

The Nippon Shokubai Group manufactures a wide variety of chemical products, and water is indispensable in the manufacturing process. For example, water is used to prepare water solution products, heat or cool materials in the manufacturing process, clean products, and operate detoxifying facilities that remove chemicals generated in the manufacturing process as well as drainage facilities. Consequently, the continuity of our business depends on our ability to ensure the sustainability of water, which we see as our responsibility to society. In an effort to conserve water resources, we are working to use water efficiently and prevent water pollution by introducing a wastewater collection system that enables acrylic acid contained in wastewater to be collected and reused. In addition, we strive to provide solutions to water problems through our products and technology (see "Environmental Contribution Products" on page 12 of this Report).

We have confirmed with the Aqueduct Water Risk Atlas, developed by the World Resources Institute (WRI), that none of our business locations are in the "Water Stress" area. We will continue to check on this matter and work on reducing water-related risks.

Water pollution prevention

To prevent water pollution, we work to eliminate the environmental impact of wastewater at all plants through high-level purification of wastewater from manufacturing processes, specifically by introducing high-performance activated sludge treatment equipment, which is capable of consistently treating even heavy-duty wastewater.

All emissions of chemical oxygen demand (COD), total phosphorus, and total nitrogen for our wastewater are at levels below municipal and prefectural agreements.

Trends in Emissions

		'17	'18	'19	'20	'21	'22
COD of wastewater	Nippon Shokubai	54	55	50	50	56	45
	Group Companies in Japan	45	53	60	61	55	72
Total phosphorus emissions	Nippon Shokubai	2.8	2.9	2.7	2.5	2.6	2.3
Total nitrogen emissions	Nippon Shokubai	47	58	55	52	56	57

(tons)

Topics \ Nippon Shokubai gets top DBJ Environmentally Rated Loan Program score for 4th time in a row

Nippon Shokubai received the highest rating in the DBJ Environmentally Rated Loan Program* operated by Development Bank of Japan Inc. (DBJ). This is the fourth consecutive time Nippon Shokubai has been awarded the highest rating, which is given to companies with "excellent advanced environmental initiatives," after getting top marks in 2008, 2012, and 2017.

This time, we received a loan under DBJ's new KPI-based environmentally rated loan program. The program is uniquely designed to support companies implementing initiatives aimed at solving social problems and increasing their corporate value simultaneously.

We will use the funds to expand the IONEL™ business. IONEL™, one of our Environmental Contribution Products, is an electrolyte for lithium-ion batteries (a material designed to solve various problems with lithium-ion batteries).

For details, see the NEWS on the Nippon Shokubai website.
URL <https://www.shokubai.co.jp/en/news/2023022712060/>

* The DBJ Environmentally Rated Loan Program is the world's first financing menu to select outstanding companies by evaluating their environmental management by means of the environmental rating method developed by DBJ.



Environmental rating award ceremony

Biodiversity Preservation

The Nippon Shokubai Group believes biodiversity preservation is a key issue in efforts toward sustainability based on the realization that all business activities both benefit from and impact biodiversity. One of our Environmental Protection Policies is to work to minimize the negative impact of our business activities on ecosystems and strive to conserve biodiversity, which we believe we can accomplish by sustaining efforts to tackle climate change, conserve the environment through our products, control chemical substances, reduce waste, prevent air pollution, and conserve water resources.

We have also enjoyed the cooperation of local governments, NPOs, and other organizations in implementing volunteer activities by Nippon Shokubai Group employees to protect and restore natural environments in Japan and other countries. Through these activities, we learn the value of preserving biodiversity and aim to empower people to conceive of and take actions to help the environment.

Biodiversity risk assessment

We conducted a survey on the proximity of major production sites of the Nippon Shokubai Group to protected biodiversity areas located within a 3 km radius by using the Integrated Biodiversity Assessment Tool (IBAT*1).

The survey has confirmed that all production sites are not in close proximity to IUCN Category*2 Ia, Ib, II, or III areas (required to be strictly protected), World Heritage Sites,*3 or Ramsar Convention Wetlands.*4 However, IUCN Category IV, V, and VI areas have been found adjacent to many of the production sites.

Fully aware of such an environment, we will continue to work to minimize the negative impact of our business activities on the ecosystem and strive to preserve biodiversity.

*1 IBAT (Integrated Biodiversity Assessment Tool): developed and provided through a partnership of BirdLife International, Conservation International, the International Union for Conservation of Nature (IUCN), and the United Nations Environment World Conservation Monitoring Centre (UNEP-WCMC).

*2 IUCN Categories: IUCN Protected Area Management Categories are assigned to legally protected areas by national government agencies to allow international comparison between national protected area networks, based on the management objectives of a protected area: Ia – Strict Nature Reserve; Ib – Wilderness Area; II – National Park; III – Natural Monument or Feature; IV – Habitat/Species Management Area; V – Protected Landscape/Seascape; VI – Protected Area with Sustainable Use of Natural Resources

*3 World Heritage: A landmark or area which is selected by UNESCO as having cultural, historical, scientific, or other form of significance, and is legally protected by international treaties. The sites are judged important to the collective interests of humanity.

*4 Ramsar Wetlands: Protected by national governments to fulfill their obligations under the Convention on Wetlands of International Importance (commonly called the "Ramsar Convention").

Nojigiku (*Chrysanthemum japonense*) preservation and popularization

To rescue, preserve, and popularize the nojigiku (*Chrysanthemum japonense*)—the endangered prefectural flower of Hyogo—the Himeji Plant has dedicated roughly 2,000 m² of its greenery yard to cultivating 160 varieties of the flower (including foundation stocks). The plant began cultivating the flowers in 1972, and has worked with the Hyogo prefectural government to distribute seedlings each year since 1974.



The nojigiku preservation garden

Forest conservation activities

▶ Creating the "Yugawara Myriad Leaves Forest"

Location: Kajiya, Yugawara-machi, Ashigarashimo-gun, Kanagawa prefecture
Duration: Since November 2013

We have implemented forest maintenance and held nature observation events in the headwater forest of the Niizaki River in the town of Yugawara. In November 2022, employees engaged as volunteers, together with forest instructors, in the activity for the first time in three-and-a-half years since the COVID-19 pandemic.



Yugawara Myriad Leaves Forest

▶ Forest and Water Resource Conservation Activities

Location: Akasai Valley at Hagacho-hara, Shiso City, Hyogo Prefecture
Duration: November 2008 – March 2023

We worked to manage and preserve the headwater forest in the Akasai Valley where the Ibo River that passes by our Himeji Plant originates.

▶ Japan-Indonesia Friendship Forests of Banten Bay for Biodiversity Preservation

Location: Serang, Banten Province, Republic of Indonesia
Duration: September 2018 – March 2023

Nippon Shokubai conducted activities aimed at restoring mangrove forests in Banten Province in the Republic of Indonesia, where PT. NIPPON SHOKUBAI INDONESIA is located.

▶ Japan-China Friendship Forest Development and Global Warming Prevention

Location: Ejin Horo Banner, Inner Mongolia Autonomous Region, China
Duration: October 2008 – March 2023

We traveled to inland China to plant trees and watch them grow with the aims of preventing desertification and restoring the expansive forests that used to exist there.

Note: The forest development initiatives in Japan and China were undertaken in cooperation with NPOs through the Green Fund of the National Land Afforestation Promotion Organization. The forest development initiative in Indonesia is undertaken in cooperation with local NPOs.

Environmental Protection Initiatives

Environmental Accounting

We base our environmental accounting on the *Environmental Accounting Guidelines for Chemical Companies* published in 2003 by JCIA and the Japan Responsible Care Council. We also refer to the *Environmental Accounting Guidelines 2005* of the Ministry of the Environment.

Costs and Benefits of Environmental Protection Duration: April 1, 2022 – March 31, 2023, Scope: Nippon Shokubai alone (millions of yen)

Category	Key Activity	Investment	Cost	Outcome
Business area cost	(1) Pollution prevention cost	18	857	No pollution problems occurred.
	(2) Global environmental protection cost	50	3,798	Saved 8,314 kL (crude oil equivalent) during the period.
	(3) Resource circulation cost	20	685	Achieved zero emissions through sorted collection and recycling of waste.
Upstream/downstream cost	Reusing resources	0	60	Reusing some drums and containers.
Administration cost	Operating environmental countermeasure systems, obtaining/maintaining ISO 14001 certification	0	604	Obtained certification for all plants, enhancing environmental management systems.
R&D cost	Developing eco-friendly products, reducing environmental impact in manufacturing processes	0	3,354	Researching and developing Environmental Contribution Products.
Social activity cost	Donating to environmental causes	0	20	Engaging in Nippon Shokubai Forest Conservation Activities.
Environmental Remediation Cost	—	0	4	—
Total		88	9,382	

Economic Benefit Associated with Environmental Protection Initiatives (Actual Benefits)

Details of Benefit		Amount
Revenue	Operating revenue from the sale of recycled waste products and used products produced through key business activities	7
Cost Reduction	Reductions in energy costs through energy conservation	1,343
	Reductions in waste disposal costs through resource	4,531
Total		5,881

Reference Total investment during the period: 8,613 million yen
Total R&D cost during the period: 14,448 million yen

Close Up

Rank-based RC Training

We continuously conduct RC training for employees for the purpose of improving their overall understanding and mastery of RC initiatives.

FY2022 was no exception—we followed the RC training curriculum to provide training for new hires and for employees on their promotions to subsection chief and management positions. We intend to continue working to enhance our RC training.



Training for employees newly promoted to managerial positions

Key Terminology

Environmental accounting

A system employed by companies and others seeking sustainable development to quantitatively understand, analyze, and publish the costs and benefits of environmental conservation activities in the context of business activities to the extent.

Process Safety and Disaster Prevention Initiatives

All Nippon Shokubai employees engage in various activities to ensure safety based on our Safety Philosophy, “Safety takes priority over production.”

Overview of FY2022

We had zero class A or B process safety accidents. In FY2022, while maintaining our basic approach to safety issues, we continued to promote our voluntary safety initiatives according to the priority initiatives of the 11th Medium-term RC Basic Plan, launched in April 2022.

Basic Approach to Safety Issues

We have incorporated the lessons learned from the accident at the Himeji Plant in 2012 to reinforce our basic approach to safety issues. We have clarified our Safety Philosophy, Safety Oath, and the safety management principles presented below, as well as the roles of the company at each organizational level, and are ensuring that all employees stay fully informed.

Principles for safety management

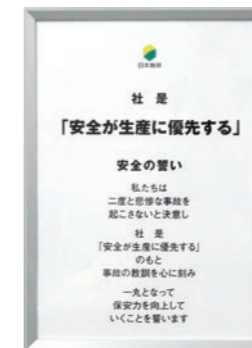
The Company’s “Rules for Safety Management” set out the basic principles for safety management, guidelines for manufacturing activities, and more, which we put into practice.

Excerpt from basic principles for safety management

- (1) Ensure safety based on our Safety Philosophy, “Safety takes priority over production.”

Guidelines for manufacturing activities

- (1) When you detect anything out of the ordinary during operations, immediately shut down operations. You are not responsible for the consequences of the shutdown.



Safety Oath



Safety Philosophy, “Safety takes priority over production”



Inspection of Kawasaki Plant by President

Message from the President on Safety

With FY2022 marking the 10th anniversary of the explosion and fire at the acrylic acid production facilities, the President re-emphasized in his speech that we should not let the memory of the accident fade away. In response, safety discussions were held in every workplace during Safe Operation Month (September 16 to October 15), in which employees looked back at the accident and discussed what should be done to prevent such an accident from occurring again.

In addition, the President visited the Himeji and Kawasaki Plants to energetically conduct safety inspections. He had a lively dialogue with the employees and re-emphasized the importance of continuing to pursue safe and stable production activities with the company’s Safety Philosophy “Safety takes priority over production” deeply in mind.



Inspection of Himeji Plant by President

Process Safety and Disaster Prevention Initiatives

Promoting Voluntary Safety Activities

Since our founding, we have promoted voluntary safety activities with the aims of ensuring safe manufacturing under proprietary technology and completely avoiding Class A and Class B process safety accidents.

Preventing trouble

Our efforts to prevent trouble include adopting HAZOP as our method of identifying potential risks at plants and systematically implementing it (including both routine and non-routine situations) in addition to consistently implementing change and non-routine work management.

We also implement small group activities—HMI activities at the Himeji Plant and TPM activities at the Kawasaki Plant—to identify deficiencies and promote improvement.

We intend to continue implementing broad-ranging activities to prevent trouble.

Systematically implementing safety measures

When accidents occur, we analyze the causes from various perspectives and implement countermeasures in addition to reflecting and systematically implementing permanent measures for facilities in maintenance plans. We also systematically promote measures to counter the age-related deterioration of facilities.

Seismic countermeasures

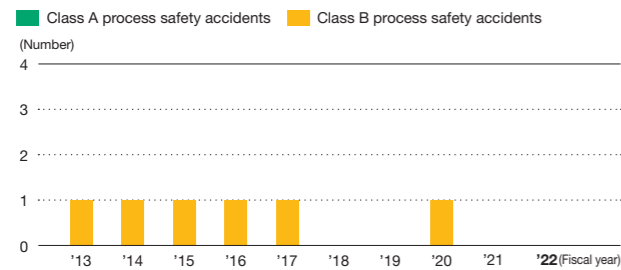
In light of our experience with the Great East Japan Earthquake in 2011, we have reviewed and undertaken both technical and non-technical measures to prepare for massive earthquakes and tsunamis. We also periodically revise and strengthen the measures.

Regarding existing measures to improve the earthquake resistance of high-pressure gas facilities, we have already verified that our spherical tanks with steel pipe braces and gas holders—critical high-pressure gas facilities in terms of seismic design—satisfy earthquake-resistance standards, and have reported that fact to the relevant administrative agencies. We will also continue to implement earthquake resistant measures for piping in FY2023.

Recent history of process safety accidents

In FY2022, we had zero Class A or B process safety accidents. We will continue efforts to prevent process safety accidents while continuously improving safety activities.

Trends in the Number of Process Safety Accidents



Key Terminology

Hazard and Operability Study (HAZOP)

A method of evaluating safety in which potential risks at plants are exhaustively identified and corresponding safety measures are systematically investigated for sufficiency.

Himeji Manufacturing Innovation (HMI) activities

Activities to promote improvement and transformation at the Himeji Plant.

Total Productive Maintenance (TPM) activities

Improvement activities aiming to actualize manufacturing methods in pursuit of the utmost comprehensive efficiency in manufacturing systems.

Enhancing education and training

We are striving to enhance training for chemical plant risk management in an effort to strengthen skills and abilities pertaining to safety.

With all due attention to measures to prevent COVID-19 infections, courses on risk management and other related topics were given in FY2022, as usual, by instructors from the Sanyo Association for Advancement of Science & Technology, in which a total of 48 employees participated.

We also collect and organize “Know-Why” information for use in training to enable trainees at both plants to inherit techniques and understand the basis for procedures and rules.

We intend to continue internal and external training while incorporating the views of our employees in an effort to improve their knowledge and awareness of safety.



A course titled “What Accidents Can Teach Us about Risk Management”

“Chemical plant accident prevention based on actual case study” class

Maintaining and improving safety management activities

RC inspections are conducted by management personnel at the Himeji and Kawasaki Plants each year. In FY2022, which marked the 10th anniversary of the 2012 accident, the management checked the status of fostering a safety culture, in addition to the safety management activities, at each plant.

The Head Office also conducted safety audits led by the officer in charge of the Responsible Care Division in an effort to continuously improve safety management activities.

Certified high-pressure gas plants

The Chidori and Ukishima Plants of the Kawasaki Plant were certified by the Ministry of Economy, Trade and Industry in 1989 and 1991, respectively, as entities capable of conducting completion and safety inspections for high-pressure gas certification, and each undergoes screenings for renewal every five years.

This certification allows plants with outstanding voluntary safety systems to continuously operate high-pressure gas manufacturing facilities and conduct their own safety inspections. The certification of the Chidori Plant was renewed in June 2022.

Improving emergency drills

Each plant has established a disaster risk reduction system and systematically conducts emergency drills for different types of disasters each year.

In FY2022, workarounds were required to conduct the drills with due attention to measures to prevent COVID-19 infections.

By reflecting the issues identified in disaster prevention drills into subsequent drills, we revise and strengthen our disaster risk reduction system as well as education and training.



Comprehensive emergency drill at the Kawasaki Plant



Comprehensive emergency drill at the Himeji Plant



Comprehensive emergency drill at the Suita Research Center

Strengthening the culture of prioritizing safety

Each plant engages in distinct initiatives—for example, self-checks of basic safety behaviors at the Himeji Plant and checks of safety behaviors at the Kawasaki Plant—in an effort to strengthen the culture of prioritizing safety.

Additionally, in November 2022, the Kawasaki Plant underwent a third-party evaluation of safety competency (safety culture) conducted by the Japan Industrial Safety Competency Center. The plant will reflect the recommendations in its RC plan in an ongoing effort to improve safety competency.

Preserving memories of accidents

To prevent memories and lessons learned from the 2012 accident from fading and to demonstrate our determination to avoid similar accidents, we held another Safety Oath Ceremony in front of the Safety Oath monument at the Himeji Plant in FY2022 to recommit ourselves to improving our safety capacity.



Safety Oath Ceremony

Commendations

At the 40th Safety Promotion Meeting and the 13th Safety Award Ceremony of the Japan Petrochemical Industry Association, an employee of the Kawasaki Plant was commended for his years of efforts and achievements in ensuring workplace safety.



Commendation at the Safety Award Ceremony of the Japan Petrochemical Industry Association

Responsible Care Initiatives

Logistics Safety Initiatives

Nippon Shokubai outsources all logistics operations to Nisshoku Butsuru Co., Ltd. The company works closely with the environmental safety and quality assurance divisions at the Himeji and Kawasaki Plants to ensure safety and quality and prevent accidents in logistics.

We regularly conduct drills for responding to accidents while products are in transit to make it possible to respond swiftly and minimize the damage in the rare occasions when such accidents occur.

We also endorse the White Logistics movement promoted by the Ministry of Land, Infrastructure, Transport and Tourism and others with the aim of realizing sustainable logistics. We issued our own White Logistics Declaration in April 2020 and have been implementing activities accordingly since then.



A drill for responding to accidents while products are in transit

Occupational Safety and Health Initiatives

Consistent with its goal to completely avoid industrial injuries at the Company and its contractors, Nippon Shokubai implements occupational safety and health activities to improve working environments, reduce risk factors, and promote the creation of comfortable workplaces.

Overview of FY2022

We experienced one injury with loss of workdays and two injuries without loss of workdays. Our contractors experienced one injury with loss of workdays and three injuries without loss of workdays. In FY2022, we promoted our occupational safety and health initiatives for industrial injury prevention according to the priority initiatives of the 11th Medium-term RC Basic Plan, launched in April 2022.

Basic Approach to Occupational Safety and Health

We promote occupational safety and health activities that prevent industrial injuries and health problems in the workplace, ensure safety and health for our employees, and create comfortable working environments.

Continuously Improving Occupational Safety and Health

We work to continuously improve occupational safety and health, mainly through our Occupational Safety and Health Management System (OSHMS). We also engage in hazard prediction (KY), *hiyari hatto* (near miss) analysis, 5S activities, and other basic safety activities on a daily basis, and systematically conduct training and drills in an effort to reduce industrial injuries. When industrial injuries occur in the workplace, we explore the causes at the scene, draft countermeasures, and have the Safety and Health Committee evaluate the countermeasures from the perspectives of labor and management to prevent the same or similar injuries from occurring again.

Risk assessment

We work to reduce and eliminate the risks of tasks and substances we work with by assessing them based on our Occupational Safety and Health Management System.

Basic safety initiatives

We recognize the importance of daily safety activities in preventing industrial injuries. Accordingly, we devote energy to KY activities preceding tasks, documenting near misses, and implementing 5S activities in the workplace. We aim to improve daily safety activities by regularly conducting KY training and seminars to maintain and improve risk awareness. Another effort aiming to prevent industrial injuries is posting posters and conducting training to thoroughly inform employees and ensure the rigorous implementation of the three basic safety behaviors: (1) Think before you act; (2) Pointing and calling; and (3) Hold the handrail when stepping on stairs.



On-site training sessions

Aiming to improve employees' sensitivity and ability to predict potential risks in the field, we provide hands-on training using a VR simulator (see p. 25 of this Report), in addition to conventional drills in which participants are exposed to chemical liquids.



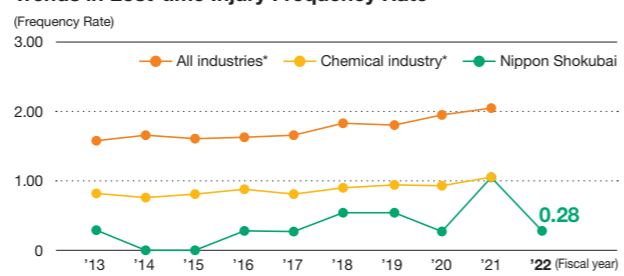
VR training (experience with a caught-in incident)

Status of industrial injuries

In FY2022, one injury with loss of workdays and two injuries without loss of workdays occurred at the Company, while our affiliates experienced one injury with loss of workdays and three without.

In the past several years, industrial injuries at the Company have often involved younger employees. Similarly, our affiliates report many injuries among relatively inexperienced workers. We intend to enhance safety training to improve risk awareness among younger and less-experienced employees.

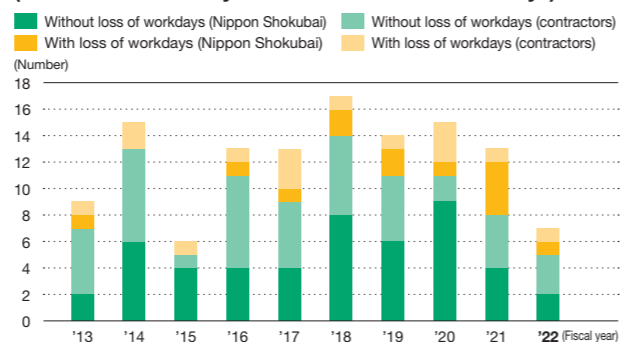
Trends in Lost-time Injury Frequency Rate



Note: Lost-time injury frequency rate: Number of casualties in industrial injuries per 1 million actual working hours

* Source: "Survey on Industrial Accidents," Ministry of Health, Labour and Welfare

Trends in Total Number of Industrial Injuries (with Loss of Workdays and without Loss of Workdays)



Health-related accommodations for retirees from the Company

Although we have never manufactured asbestos products in our history, some of the insulation materials and sealants we used contained asbestos. Therefore, we respond to health-related consultations from retirees from the Company and set up medical examinations for all who desire them. For more information, please visit our website.

Key Terminology

Hazard prediction (KY activity)

An activity involving holding meetings before starting tasks to identify potential hazards (unsafe behaviors and conditions) and undertake countermeasures in an effort to prevent injuries.

Near miss analysis

Reflecting on near misses in everyday operations to identify why they occurred and how they could have been avoided, and undertaking safety measures in terms of both facilities and behavior.

5S activities

Promoting and practicing the 5S: sort, set in order, shine, standardize, and sustain.

Chemical Safety Initiatives

Nippon Shokubai promotes chemical product control by complying with laws and regulations, disseminating information, and engaging in other efforts to completely avoid legal and social problems with chemical products throughout their lifecycles.

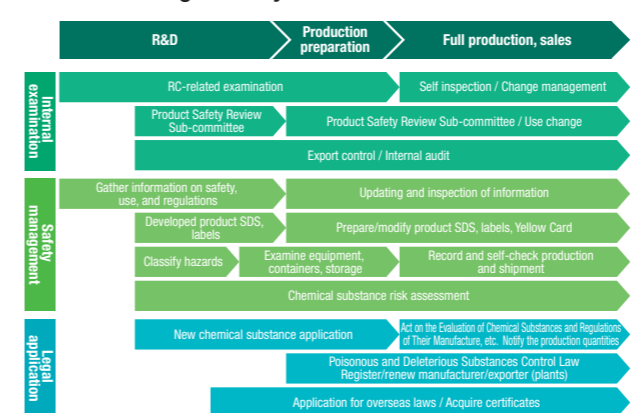
Overview of FY2022

Faced by the tightening of laws and regulations, and industry standards for management of chemical substances, as a result of efforts to collect information related to product safety and applicable laws and regulations, and to disseminate the information throughout the company, we were able to achieve zero legal and social problems in FY2022. Drastic amendments to the Act on the Assessment of Releases of Specified Chemical Substances in the Environment and the Promotion of Management Improvement and the Industrial Safety and Health Act brought significant revisions to the types of materials and substances that are subject to reporting and labeling requirements in FY2022. We are systematically working on changes to SDS and labels to meet legal deadlines so that there will be no compliance problems later. We will continue to develop a system for the management of chemical substances capable of adapting to diverse laws and regulations, as well as social situations.

Rigorous Chemical Product Control throughout Product Lifecycles

We establish internal systems for compliance with domestic and foreign laws and regulations pertaining to chemical products, disseminate information about product safety and applicable laws and regulations to customers, and undertake other efforts to promote chemical product control with the aim of completely avoiding legal and social problems with chemical products throughout their lifecycles, from research and development to disposal after they are used.

Chemical Management System



Operating our chemical substance control system

We established a chemical substance control system to centrally manage information on chemical substances, raw materials, product-related hazards, laws and regulations, and more, and use the system for many purposes, including evaluating risks, preparing SDS, and responding to customers' inquiries about the chemical substances in products. We are also sustaining efforts to update information and improve the functionality of the system, and in FY2020 launched an automatic warning label-creating function based on the system, that we began using for products in development.



Example of an SDS Example of a warning label

Accommodating chemical registration requirements within and outside Japan

We work with specialized agencies and Group companies outside Japan to comply with laws and regulations, for example the Chemical Substances Control Act and the Industrial Safety and Health Act of Japan, TSCA in the USA, and REACH in the EU.

We also hold training on laws and regulations and briefings on new systems pertaining to chemical product control on a regular basis to inform our employees and foster in them a sense of respect for the laws and regulations.

Additionally, regarding acrylic acid—a priority assessment chemical substance under the Chemical Substances Control Act—an organization to which we belong conducts safety tests for aquatic life, and we submit information and otherwise respond proactively to risk assessments by the central government.

Import and export control initiatives

To ensure faithful compliance with import and export regulations, we establish and maintain Company rules, inform everyone in the Company of decisions as to controlled items, establish and maintain a shipping management system tied to our central accounting system, and conduct internal training on a regular basis. Additionally, our annual internal audit revealed no problems with exports during CY2022.

Efforts toward product safety

We strive to ensure the safety of new products and swiftly put them on the market by appropriately and promptly examining the safety and compliance status throughout the chemical product lifecycles at each stage, from research and development to commercialization.

Product safety initiatives

We create GHS-compatible Safety Data Sheets (SDS), warning labels, and Yellow Cards to promote the dissemination of information to our customers and the education of our employees. We also conduct strict checks of products intended for different end-uses (e.g. active pharmaceutical ingredients, pesticides, cosmetics, food additives) that include action by the Product Safety Review Subcommittee to comply with the Product Liability Act (PL Act).

Key Terminology

Yellow Card

The yellow card is a unique initiative in Japan, which lists a product's hazards, first aid procedures in an accident, and emergency contact information. As part of its promotion of RC, JCIA prepares and manages guidelines on the procedures for preparing a yellow card in order to strengthen first aid measures in the event of an accident. Carriers transporting dangerous goods are encouraged to carry a yellow card to report information about the cargo to the fire brigade in the event of an accident.

Quality Initiatives

We make efforts to maintain and improve quality under a basic quality policy of consistently providing products and services that satisfy customers and are worthy of their trust.

Overview of FY2022

We achieved our target of zero serious quality complaints. Quality audits for Nippon Shokubai plants and Group companies both inside and outside Japan were conducted to confirm that compliance is ensured for the entire Group.

Continuous Improvement of Quality

Customer satisfaction initiatives

All our plants and all the Group companies both inside and outside of Japan engaged in manufacturing have introduced quality management systems. We implement our quality assurance initiatives from the customer's perspective from the product development stage through manufacturing and delivery.

We are dedicated to the continuous improvement of our quality management system to ensure our customers are satisfied with the stable high quality of our products and services.



Quality control convention

Promoting activities to prevent problems with quality

We respond quickly to any complaints or inquiries from customers concerning our products. At the same time, we prevent quality issues from occurring through company-wide distribution of case studies. In FY2022 as well, we shared information about complaints and problems at meetings of division leaders and took permanent measures for the prevention of recurrence. We share information about the complaints and problems we had in FY2022 at meetings of division leaders, and take permanent measures for the prevention of recurrence. The information on quality complaints and issues are also distributed to our Group companies in Japan, with the aim of preventing similar quality problems.

Initiatives toward gaining greater public trust

We maintain quality systems that preserve the feelings of safety and security our products deliver. The quality assurance departments at our Head Offices conduct quality audits at our plants and Group companies and engage in other efforts to monitor the state of quality assurance systems and quality control at all Group manufacturing facilities.

In quality audits for FY2022, a Lot traceability exercise of the products with quality problems that have occurred in the past was used to check whether countermeasures against past quality issues had been taken on an ongoing basis, and to confirm that there was no problem with the quality system.

These audits did not reveal any problems that were considered to constitute non-conformance. We will conduct quality audits on a continual basis to check that measures to meet customer requests and countermeasures against past quality issues are taken properly.

Key Terminology

chemSHERPA

This shared system for transmitting information about chemicals contained in products to supply chains was developed under the initiative of the Ministry of Economy, Trade and Industry in Japan. Full-scale utilization began in April 2018.

Supply chain initiatives

Nippon Shokubai promotes initiatives to ensure supplies of safe and reliable products throughout the entire supply chain, from procurement of raw materials to manufacture and sales of products. In accordance with our regulations for green procurement management, we have independently assigned substances that are regulated or highly hazardous to two categories: "prohibited substances" and "restricted substances." We are promoting the development of green products and the procurement of raw materials with low environmental impact while controlling the inclusion of such substances in our products. For information transmission sheets, we have introduced chemSHERPA.

Introducing products with halal certification

Parts of Southeast Asia, most notably Malaysia and Indonesia, are home to many Muslims, and demand for halal-certified ingredients and production processes from food-related businesses has been increasing. In response to this situation, we have acquired halal certification for products for which acquisition of the certification is strongly urged by customers. Specifically, in 2014, the Himeji Plant acquired halal certification for organic acids (maleic anhydride, succinic acid, and disodium succinate), and Sino-Japan Chemical Co., Ltd. acquired halal certification for some products. In 2015, the Himeji Plant acquired halal certification for sodium polyacrylate (AQUALIC™ H series), too. Furthermore, PT. Nippon Shokubai Indonesia (NSI) acquired halal certification for all products in 2019. With these certifications, we can expect further expansion of demand for these products in Southeast Asia. We will make continuous efforts to provide prosperity and comfort to people and society by responding to the needs of society.

Note: Examples of products for which our Group has acquired halal certification (as of April 1, 2023)

Succinic acid, disodium succinate, maleic anhydride, AQUALIC™ FH (food additives use), AQUALIC™ MH (feed additive use) and AQUALIC™ IH (industrial use), and All products produced at NSI (Acrylic acid (AA), Acrylates (AES), Superabsorbent polymers (SAP))



NSI Halal certification

Halal Certification

A certification with religious relevance, granted by the relevant organizations when certain standards are satisfied, for products and services targeted at Muslim customers.

Communication with Society

Guided by our Group Mission of "TechnoAmenity: Providing Prosperity and Comfort to People and Society, with Our Unique Technology," we are implementing and promoting various initiatives, including community co-creation and the training of next-generation human resources, as part of our CSR activities.

Community Co-Creation

We have established opportunities to communicate with local communities around each of our plants based on our belief that trust-based relationships with community members are essential for stable plant operation.

Cleanup activities

We regularly clean up areas around our plants and cooperate with community beautification efforts.



Cleanup activity

Potato harvesting

We grow sweet potatoes in a potato patch in the greenery yard at the Himeji Plant, and children from nearby preschools and nursery schools enjoy digging them up at harvest time. We have done this every year since 1971, and it has enriched our connections with the community—some of the children have even gone on to join the company when they grew up.



Children harvest potatoes

Dialogue with local communities

We participate in the community dialogue undertaken by JCIA Responsible Care Committee in the areas in which our plants are located to explain and communicate our RC activities to the neighborhood associations, local governments, NPOs, industrial associations, companies, and other participants in pursuit of mutual understanding.

The dialogue was held in writing, rather than in-person, as a means of preventing the spread of COVID-19 infections.



Dialogue with local communities Proceedings of the dialogue held in writing (cover)

Developing Next-Generation Human Resources

We participate and engage in various events and activities to promote learning and fun environments while making chemical technology more relatable. We have also created internship opportunities to give people hands-on experiences of what it is like to work for us. These activities that leverage the qualities of our business contribute to the development of tomorrow's leaders.

Demonstrations of Chemistry Experiments for Children

We put on demonstrations titled "Superabsorbent Polymers: Mysterious Powders." Children find these demonstrations to be a fun, interesting introduction to chemistry.



Experiment Show

Internship Program

We have created internship opportunities for technical college students.



Internship

Delivery class for junior high schools

We offer a "delivery class" to teach the attractions of our work to junior high school students. To interest students in chemistry and work, the lecturer talked about the pleasure of work and the sense of satisfaction from work.



Delivery class at a junior high school

Production/R&D Site Reports

Himeji Plant

Plant Outline

Plant Manager Tokihiro Yokoi, Executive Officer
 Location 992-1 Aza-Nishioki, Okinohama, Aboshi-ku, Himeji, Hyogo
 Number of employees 1,235 (including research center)
 Products Acrylic acid, acrylates, maleic anhydride, superabsorbent polymers, resin modifiers, electronic information materials, De-NOx catalysts, dioxins decomposition catalysts, and other products
 TEL +81-79-273-1131
 FAX +81-79-274-3723



Tokihiro Yokoi,
Plant Manager

FY2022 Results of RC Activities

- Occupational safety and health
- Process safety and disaster prevention
- Environmental protection

Zero injuries with loss of workdays, four injuries without loss of workdays (including contractors)
 Zero Class A and Class B process safety accidents
 Implemented measures for energy conservation amounting to about 4,800 kL/year (crude oil equivalent)

FY2022 marked the 10th anniversary of the explosion and fire at the acrylic acid production facilities. We held a lecture meeting on safety with Dr. Masayoshi Nakamura, an accident investigation committee member, as the lecturer. This lecture meeting provided employees with an opportunity to think anew about what we should do to pass on the lessons of the accident to future generations and prevent such an accident from recurring.

As for occupational safety and health, the Himeji Plant has continued to strive to thoroughly implement the practice of basic safety behavior (think before you act, pointing and calling, and hold the handrail when stepping stairs). As a result, the number of industrial injuries decreased by half from eight in the previous year to four, and there were zero injuries with loss of

workdays.

Regarding environmental protection, we provide education to employees from various angles to strengthen our activities to achieve carbon neutrality. As part of such efforts, a lecture was given by a researcher of JAXA (the Japan Aerospace Exploration Agency) with the theme "Earth Seen from Space."

In addition, in an effort to promote smart safety, we are working to advance the use of new inspection technology for facilities. For example, a drone is used to check facilities and equipment, producing results.

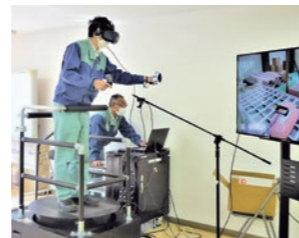
The Himeji Plant will continue to strive to provide maximum value for customers by enhancing the resilience of each member of the plant.

Hands-on learning using VR safety experience equipment

In FY2022, the Himeji Plant provided hands-on safety education using VR (virtual reality). This education program, which is designed to enhance employees' awareness of safety through firsthand experience, has recently been introduced as a new safety education method by many companies in the manufacturing industry.

This time, we introduced VR contents for one month through a subscription system to enable employees to have virtual-reality experiences with various types of injuries and accidents using a three-axis VR simulator, such as falling from a height, being caught in machinery, a fire outbreak, or a dust explosion. In this education program, 320 employees of the plant participated and gave feedback in a questionnaire, saying things like, "I was able to have a unique experience that was beyond my imagination and that cannot be provided by case study-based education," and "This experience made me aware of a sense of danger and fear that I didn't feel before." The participants' feedback shows that the purpose of this education program was achieved.

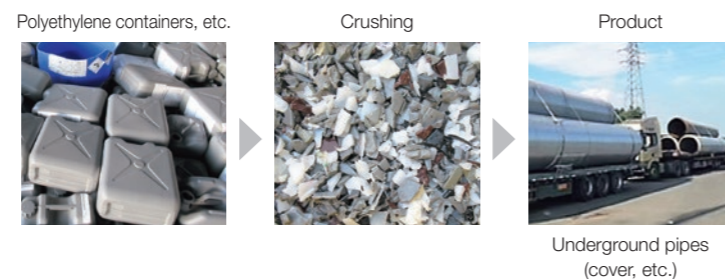
We will consider introducing VR contents that respond to various on-site needs, and expanding VR education to other plants and contractors.



Hands-on learning using VR safety experience equipment

Material recycling of waste plastics

The enactment of the Plastic Resource Circulation Act has accelerated the move toward transition to a circular economy. At the Himeji Plant, plastic containers for raw materials had been incinerated as industrial waste. We have decided to recycle some waste plastics and offer them as raw materials of plastic products. We will continue to contribute to reducing waste, promoting the effective use of resources, and decreasing CO₂ emissions by increasing the number of recyclables.



Kawasaki Plant

Plant Outline

Plant Manager Yoshihisa Oka, Executive Officer
 Location Chidori Plant 14-1 Chidori-cho, Kawasaki-ku, Kawasaki, Kanagawa
 Ukishima Plant 10-12 Ukishima-cho, Kawasaki-ku, Kawasaki, Kanagawa
 Number of employees 370
 Products Ethylene oxide, ethylene glycol, ethanolamine, secondary alcohol ethoxylates, polymers for concrete admixture, acrylic acid special ester, and other products
 TEL +81-44-288-7366
 FAX +81-44-288-8492



Yoshihisa Oka,
Plant Manager

FY2022 Results of RC Activities

- Occupational safety and health
- Process safety and disaster prevention
- Environmental protection

Two injuries with loss of workdays, one injury without loss of workdays (including contractors)
 Zero Class A and Class B process safety accidents
 Implemented measures for energy conservation amounting to about 3,400 kL/year (crude oil equivalent)

Regarding occupational safety and health, the Kawasaki Plant had two injuries with loss of workdays (backache and a fall) and one injury without loss of workdays (chemical burns). To thoroughly prevent similar issues, we provided re-education in work procedures and strengthened scaffoldings.

For process safety and disaster prevention, we ensured safety management. As a result, we achieved zero Class A and Class B process safety accidents. In addition, we underwent a third-party evaluation by the Japan Industrial Safety Competency Center, through which we were able to confirm that our safety foundation and culture had been maintained, and identified the issues to be tackled to further strengthen them.

For environmental protection, we took energy conservation measures, including heat recovery through modification of equipment. Regarding substances subject to the PRTR Law, we continued to work for the recovery of boron and conducted comprehensive inspections centering on the substances added to the list of those subject to the law due to its amendment. The inspections ensured that we grasp our emission amount without omission.

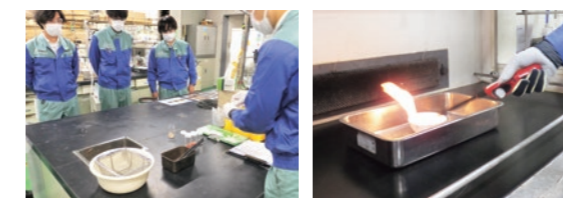
We will continue to promote RC activities to ensure safety and even higher reliability.

Experience-based education for employees in administrative areas

Recently there have been fewer opportunities for employees to learn firsthand about "fears" in a chemical plant. We provide hands-on education to employees to enhance their awareness of danger. At the Kawasaki Plant, we provide experience-based education for not only young operators but also those working in administrative areas, including the technical department and the engineering department, who often make on-site visits.

In an experiment on chemical burns, chicken meat and a piece of the material used for protective equipment are dipped in chemical solutions handled at the plant, such as acids and alkalis, to see how they change in color and shape. In addition, participants learn the importance of washing at the time of exposure to a chemical solution through a demonstration that shows how difficult it is to restore the chicken meat exposed to the chemical solution to a neutral pH by washing it with water. In an experiment on burning, various hazardous materials are burned in a laboratory to see how the color and shape of the flame change.

Considering the effectiveness of education for those working in plants, we will strive to enhance their safety awareness.



Experiment on chemical burns Experiment on burning

Reinforcement of young employees' on-site capabilities

As part of education and training activities conducted under the RC Promotion Plan, the Kawasaki Plant places emphasis on the enrichment and effective use of documents necessary to pass on skills. In an effort to pass on the tacit knowledge that experienced employees have acquired to younger employees, the production division continues to provide education to enhance employees' inspection skills.

In this education program, persons who stay at the company under its post-retirement re-employment system serve as instructors, taking advantage of the deep production knowledge they have acquired through many years of experience in operation management and equipment modification. Those re-employed workers join young employees in their on-site inspection and give guidance on inspection points. They also provide explanations about equipment that is not subject to inspection, including the background to modification, configuration, and operating conditions. This education program helps young employees add new perspectives to their inspection activities and improve their ability to perceive changes occurring on-site and respond to them promptly.



On-site training to enhance inspection capabilities

Suita Research Center

Suita District Outline

Representative Yasutaka Sumida, Member of the Board, Managing Executive Officer

Location 5-8 Nishi Otabi-cho, Suita, Osaka

Number of employees 421

R&D organizations Corporate Research Division, GX Research & Development Division, Industrial & Household Chemicals Research Department, Battery Materials Research Department, Electronics & Imaging Materials Research Department, Process Technology Center, Health & Medical Business Division, Cosmetics Materials Research Group, IONEL Project Technology Department, Water & Environment Solutions Business Department, R&D Management Department, General Affairs Research Department, Responsible Care Research Department

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Yasutaka Sumida,
Member of the Board,
Managing Executive Officer



FY2022 Results of RC Activities

- Occupational safety and health
- Process safety and disaster prevention
- Environmental protection

Zero injuries with loss of workdays, zero injuries without loss of workdays*
Zero Class A and Class B process safety accidents
Recycling 100% of waste

* Total number for Suita Research Center and Himeji Research Center

Regarding occupational safety and health, we had zero injuries with loss of workdays and zero injuries without loss of workdays. We believe that these results are attributable to our constant efforts focused on risk reduction and risk prediction. We will remain vigilant in pursuing safety activities.

For process safety and disaster prevention, training in risk management to prevent the occurrence of accidents was given by an external organization, and lecture meetings on disaster management were held with internal personnel as lecturers. To increase our disaster prevention capabilities,

various emergency drills were also conducted, including those for initial response to fire, and for disaster prevention organizations for self-protection.

With regard to environmental protection, we attained the targets set for FY2022 by continuing to achieve 100% recycling of waste and enhancing energy conservation through efficient operation of air conditioning equipment and the updating of power machinery.

Aiming at ensuring sustainable and safe research activities, we will continue to promote RC activities.

Commitment to education

To enhance our ability to respond to earthquake disasters, we held a lecture meeting as part of employee education, with a former firefighter as the guest speaker. Participants learned about preparedness for disaster and preparatory measures from a real experience-based discourse given by the speaker who, as a firefighter, immediately went to affected areas and engaged in rescue operation and fire extinguishment at the time of the Great Hanshin-Awaji Earthquake.

He talked about many unanticipated events that happened in the wake of the disaster, including delay in response due to confusion in the chain of command, delayed arrival of fire engines due to heavily damaged roads and many abandoned vehicles, manual operation to rescue persons buried under the wreckage of collapsed houses in some areas that heavy machinery could not access, and failure to stop fires effectively due to lack of fire-fighting water resulting from damage to water supply systems.

Through this lecture meeting, we recognized afresh that it would be necessary to provide training designed for disaster management teams to enhance their ability to respond to emergency situations, on the assumption that emergency materials and equipment would suffer damage.



Lecture meeting

Enhancement of chemical substance management

In FY2022, Suita Research Center adopted a "reagent management system," which enables the use of reagents by each department of the Center to be managed by issuing a bar code for every container and reading the barcode.

The introduction of this system, which automatically records the use of chemical substances, significantly reduces the workload conventionally needed for the preparation of documents, and eliminates the step of checking to prevent error in posting. Regarding general-purpose reagents, this system allows employees to check other departments' holding status of a specific reagent and to share the reagent, eventually leading to reducing the redundancy of reagents.

We have just introduced the system, but we will make improvements as necessary to further increase its convenience.

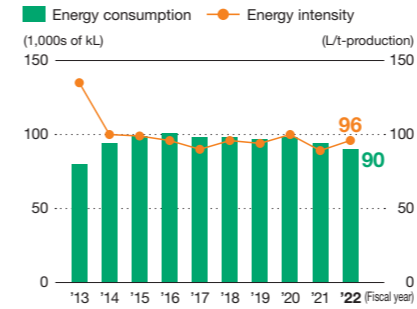


Reagent management system

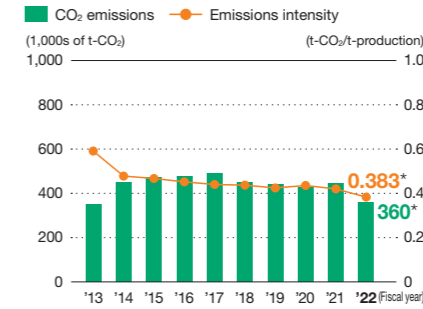
Plant Data

Himeji Plant

Trends in Energy Consumption and Intensity

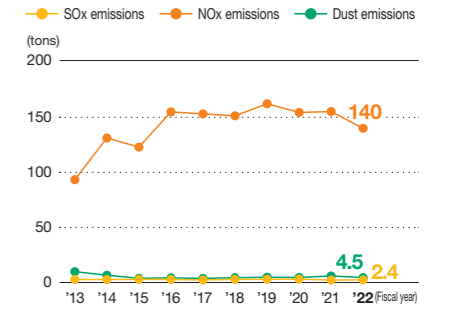


Trends in CO₂ Emissions and Intensity

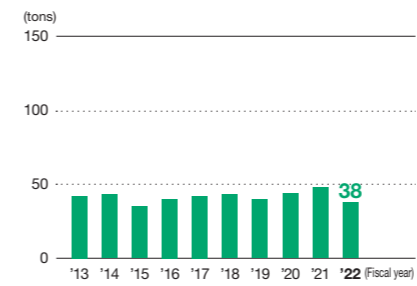


* Including emissions offset by buying carbon-neutral city gas

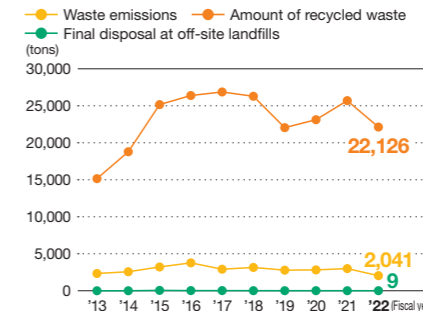
Trends in Emissions of SO_x, NO_x, and Dust



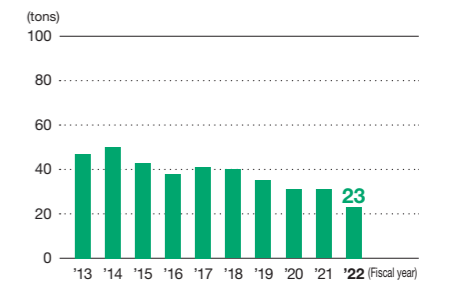
Trend in COD of Wastewater



Trends in Amount of Waste, Recycled Waste, and Waste for Final Off-site Landfill Disposal

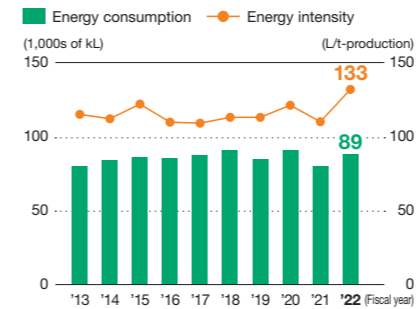


Trend in Emissions of Substances Subject to the PRTR Law

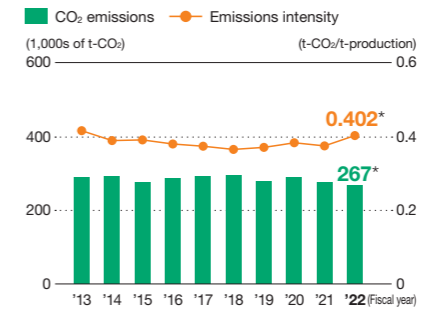


Kawasaki Plant

Trends in Energy Consumption and Intensity

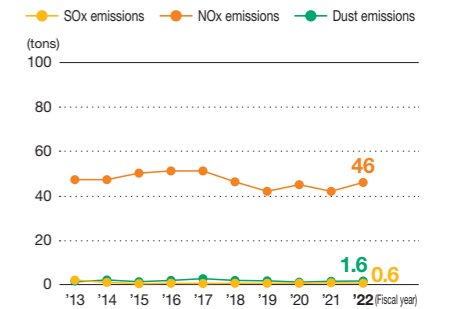


Trends in CO₂ Emissions and Intensity

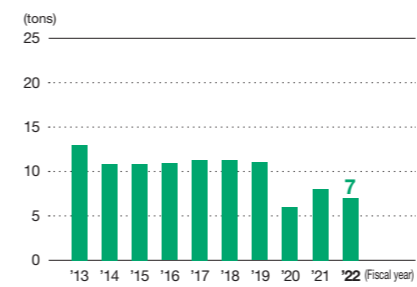


* Including emissions offset by buying carbon-neutral city gas

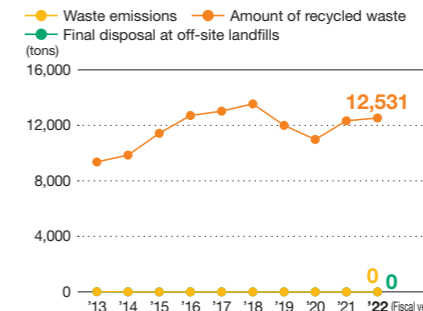
Trends in Emissions of SO_x, NO_x, and Dust



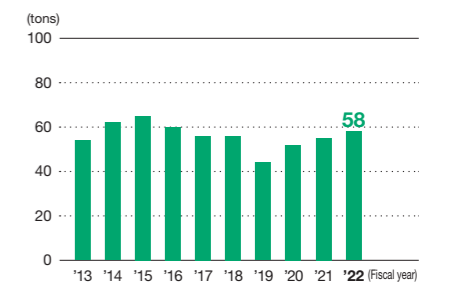
Trend in COD of Wastewater



Trends in Amount of Waste, Recycled Waste, and Waste for Final Off-site Landfill Disposal



Trend in Emissions of Substances Subject to the PRTR Law



Providing Support for Group Companies

In the interests of strengthening group management, we are providing active support for the RC initiatives of our Group companies.

Support for Environment and Safety Activities

RC discussions

The RC Division holds RC discussions to promote and improve RC initiatives for Group companies both inside and outside Japan.

In FY2022, discussions were held in-person with six Group companies inside Japan for the first time in three years, and online with one Group company outside Japan.

In these discussions, the companies in Japan reported on the planning and achievements of their RC initiatives. And the company outside Japan reported on the planning and achievements of its RC initiatives, as well as the status of operation of its management systems. We provided them with advice and support.



RC discussion with Nisshoku Techno Fine Chemical Co., Ltd.

RC discussion with Singapore Acrylic Pte Ltd

Environmental and safety audits

We conduct environmental and safety audits at our Group companies in Japan every year to strengthen our environmental safety management structure and promote continuous system improvements.

In FY2022, the audits were conducted in-person for the first time in three years. We were able to confirm compliance with legal requirements as well as the status of the establishment and operation of necessary standards related to safety and the environment. We also confirmed that their environment and safety management systems are properly implemented.



Environmental and safety audit of Nippon Chemicals Co., Ltd.

Environmental and safety audit of Tokyo Fine Chemical Co., Ltd.

Environment and safety exchange meeting

Every year, environment and safety personnel of our Group companies inside Japan gather at one of the companies to hold an environment and safety exchange meeting. At the meeting, the participating companies introduce their RC initiatives and share information with each other to improve the level of their initiatives. In FY2022, the meeting was held online to share information and exchange views on the implementation status of task risk assessment and relevant measures as well as safety measures for new employees.

An exchange meeting for Group companies outside Japan is held as appropriate, to allow the participants to share favorable initiatives and implement them in their own companies. In FY2022, the meeting was held online, with the participants sharing good practice and exchanging views.



Environment and safety exchange meeting for Group companies outside Japan

Support for Quality Activities

Support for quality assurance initiatives

For Group companies inside Japan, in FY2022, we continued to provide advice and support on their quality activities and quality issues through quality roundtable meetings.

For SAP manufacturing sites of Group companies outside Japan, to ensure high quality at the same level at our all sites for our core businesses, we have a quality meeting every year with the members in charge of quality of each site.

In FY2022, the meeting was held in person at the Himeji Plant of Nippon Shokubai for the first time in three years, although some sites participated online. As usual, we also held a periodic meeting with each site, including Sino-Japan Chemical Co., Ltd. We continue to provide even closer support to the Group companies, including the enhancement of the quality-related database for work sites outside Japan.

Quality audits

Quality audits for the Group companies inside Japan for FY2022 were conducted focusing on products that had caused issues in the past. Through a Lot traceability exercise, the auditors checked whether day-to-day operations had been conducted in accordance with established procedures, and whether countermeasures against the recurrence of the issues had been taken on an ongoing basis. The audit findings were shared within the Group companies to raise the level of their initiatives.

For Group companies outside Japan, internal audits of SAP manufacturing sites were conducted in-person in FY2022 for the first time in three years, although at some sites, on-site audits were postponed due to the impact of COVID-19. For sites manufacturing products other than SAP and the SAP manufacturing sites for which on-site audits were not performed in FY2022, auditors will visit these sites for auditing in FY2023.

Quality exchange meeting

Every year, quality personnel from us and the Group companies inside Japan hold a quality exchange meeting, taking turns to lead it. In FY2022, the meeting was conducted face to face for the first time in three years. Based on the theme of "delivery specifications," participants shared their current status and challenges to be tackled, the information thereof having been collected through a prior questionnaire survey. Lately, unavailability of materials and raw materials sometimes forces abrupt changes in schedule. The participants exchanged views and ideas about how their companies coped with the situation.



Quality exchange meeting for Group companies in Japan

Initiatives of Group Companies

Group Companies in Japan

NIPPON NYUKAZAI CO., LTD.

Principal business	Manufacture and sale of surfactant and other chemicals
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In FY2022, we at Nippon Nyukazai promoted RC initiatives regarding occupational safety and health by analyzing all the cases of industrial injuries that had occurred in the past at our company, and identified trends from specific perspectives, including age brackets. In consideration of these trends, we will continue to promote our basic safety initiatives steadily to reduce injury risk.

In terms of quality, we analyzed the quality *hiyari hatto* (near miss) incidents reported in and after FY2019. From among the items describing the conditions of the relevant employees when such incidents occurred, "Did not notice at all" and "When performing familiar routine tasks" ranked high. Considering that there may be some risk factors hidden behind familiar routine work, we will utilize what we have learned from past near miss incidents to prevent the occurrence of similar near miss incidents.

For environmental protection, we implemented measures to reduce atmospheric emissions of substances subject to the PRTR Law. Regarding the issues that we are currently considering for improvement, we will proceed with our investigation to further promote the reduction of emissions.

Regarding communication with society, a clean-up activity was carried out by the Kashima Plant for the first time in three years, in which 29 people (including 12 families of our employees) cleaned Nikkawahama Beach.

We will continue to further promote our RC initiatives while pursuing safe operation.



Kashima Plant: Cleanup activity on Nikkawahama Beach

Interview

Replacement of UPS (uninterruptible power-supply system) under equipment replacement plan

The Kashima Plant of Nippon Nyukazai Co., Ltd. is working on the replacement of various types of equipment under its equipment replacement plan. The UPS of the plant was working stably thanks to regular maintenance. Considering it plays an important role in the case of power failure, the UPS was replaced in FY2022 as planned.

In October 2022, after the replacement of the UPS, the plant and the surrounding area suffered a power outage due to damage to power transmission lines caused by a rainstorm. Until the plant's emergency power-generating facilities were activated, the UPS supplied power in a stable manner, enabling the plant to be controlled safely without interruption of the DCS (distributed control system).

We will continue to make efforts to ensure the stable operation of the plant by promoting the replacement of equipment in a planned manner.

Satoshi Konno
Chief, Kashima Machinery & Equipment Maintenance Sect., Engineering Dept.
Nippon Nyukazai Co., Ltd.



NISSHOKU TECHNO FINE CHEMICAL CO., LTD.

Principal business	Manufacture and sale of (meth)acrylic acid derivatives and photo/electro chemicals
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In FY2022, Nisshoku Techno Fine Chemical had one injury without loss of workdays involving a young employee, and it immediately took countermeasures against the recurrence of such an injury, including re-education on the handling of equipment. To prevent industrial injuries, we are continuously carrying out KY risk prediction and *hiyari hatto* (near miss) campaigns, and reviewing the risk assessment of the tasks to which any change was made. In addition, we are conducting various events to promote safety activities, including a safety convention in July and a health convention in October.

In an effort to promote environmental protection, we are striving for even more efficient operation of production facilities by setting the target of reducing waste intensity, the emissions intensity of substances subject to the PRTR Law, and the energy use intensity to below the FY2021 levels. Under the medium-term plan, we are also working to reduce environmental impact by converting fuel in steam boilers from heavy oil to city gas to reduce CO₂ emissions.

For process safety and disaster prevention, we carried out a disciplinary drill under the guidance of the Ichikawa Collaborative Disaster Control Center, partly due to a recent increase in the number of young employees. In addition, a comprehensive emergency drill was held, including an evacuation drill on the assumption of a tsunami caused by an earthquake and a disaster response drill.

In FY2023, we will continue to conduct safety and disaster control activities while taking measures against COVID-19.



Disciplinary drill under the guidance of the Ichikawa Collaborative Disaster Control Center

Comprehensive emergency drill

NIPPON POLYMER INDUSTRIES CO., LTD.

Principal business	Manufacture and sale of acrylic resins
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Regrettably in FY2022, Nippon Polymer Industries had one injury with loss of workdays and four injuries without loss of workdays (one of which occurred in a contractor). We take seriously the fact that there was an increase in cases involving new employees and less experienced workers. As part of efforts to prevent such occupational injuries, we are working on the revitalization of *hiyari hatto* (near miss) campaigns, including drastically improving the near miss report format and its submission system. We are also reviewing on-site warning signs (consideration of adoption of universal design) and education curriculums.

For process safety and disaster prevention, we held a joint emergency drill with the fire department in a way similar to a "blind" method, in which the fire department controls the timing of event occurrence to make the drill more practical, rather than a drill based on conventional scenarios. As a result, we were able to identify many challenges to be resolved and learned a lot.

We will continue to work on RC initiatives with full participation whenever possible, aiming for zero accidents and zero injuries.



Joint emergency drill

Initiatives of Group Companies

Group Companies in Japan

NIPPOH CHEMICALS CO., LTD.

Principal business Manufacture and sale of iodine, iodine compounds, raw materials for pharmaceuticals and pesticides, and natural gas

In FY2022, Nippon Chemicals formulated a three-year medium-term RC plan, and has since been promoting RC initiatives.

For occupational safety and health, regrettably, we had four injuries without loss of workdays. By type of injury, one case fell in the category of "cuts," and the other three in "exposure to harmful substances," all of which were caused by unsafe behaviors resulting from familiarity with tasks and carelessness. We will strive to prevent the occurrence of such industrial injuries by ensuring basic safety behavior and enhance the safety awareness of employees. In FY2022, moreover, we created a poster titled "safety declaration at the workplace" by involving Group company employees working in the same workplace to enhance a spirit of teamwork and promote mutual awareness raising.

We launched an environmental protection sub-committee to implement initiatives toward carbon neutrality. To achieve the GHG emissions reduction goal, we determined how much gases were being emitted, identified self-flowing methane from a well for extracting groundwater (brine water) that contains iodide ion and natural gas as another source of GHG, and calculated its emissions.

We will further promote RC initiatives with full participation.



Poster: "Safety declaration at the workplace"



Well for extracting brine water and natural gas

TOKYO FINE CHEMICAL CO., LTD.

Principal business Manufacture and sale of antiseptics, antifungal agents, disinfectants, brine, stabilizers of vinyl chloride resins, etc.

In FY2022, the first year of the 8th RC Promotion Plan, we at Tokyo Fine Chemical engaged in RC initiatives under Nippon Shokubai's safety philosophy "Safety takes priority over production," as in the previous fiscal year. Regrettably, however, we had two industrial injuries, both of which involved young employees. We, together with young employees with less experience, are currently reviewing the task risk assessment made in the past. We will promote our initiatives toward zero industrial injuries.

For environmental protection, we continuously worked on waste reduction and sorting, resulting in a significant enhancement of the recycling rate of waste plastics.

In February 2023, our Yokosuka Plant was commended by Yokosuka City for being an excellent plant. Mayor Katsuaki Kamiji visited the plant, where an awarding ceremony was held.

We will continue to make company-wide efforts in further promoting and reinforcing RC initiatives.



Excellent plant award ceremony

CHUGOKU KAKO CO., LTD.

Principal business Manufacture and sale of adhesive-processed products and fine sphere particles

In FY2022, for occupational safety, Chugoku Kako had zero injuries with or without loss of workdays for the first time since 2016, achieving the target of improving its record to 1,800 days. As a specific effort, we provided employees with re-education on *hiyari hatto* (near miss), task risk assessment, and past cases of industrial injuries. In light of the fact that many industrial injuries involving new employees have occurred at Group companies, we are planning to provide safety education to young employees in FY2023.

Regarding environmental protection, we are making steady progress toward the FY2030 goal of reducing GHG emissions by 30% from the FY2014 levels by the replacement of boilers (to change the fuel to city gas) in 2021.

In our improvement and proposal activity "Chugoku Kako Improvement ACTION," launched in 2020, a total of 284 proposals were made over two years, bringing about tangible results in a reduction in workload, information sharing, and safety and quality improvement.

We will continue to promote RC initiatives with an eye to continuously achieving zero injuries and reducing environmental impact.



A continuous record of zero injuries with loss of workdays



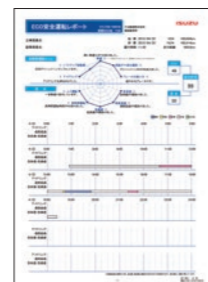
"Chugoku Kako Improvement ACTION" posted on a bulletin board

Nisshoku Butsuryu Co., Ltd.

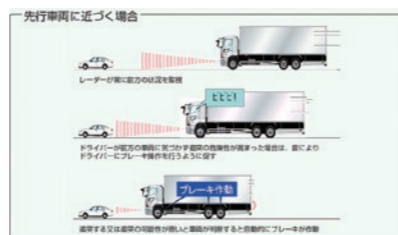
Principal business Logistics of chemicals

The Nisshoku Butsuryu Group positions "providing environment-friendly, safe, and high-quality logistics services for chemicals and contributing to society through its RC initiatives" as its key management policy. Under this policy, we have been working on the reduction of GHG emissions as an initiative to reduce environmental impacts and promoting risk prediction as an initiative to achieve zero accidents and injuries. We also promote proper operation of advanced operation information systems and the introduction of vehicles equipped with Advanced Emergency Braking System as priority tasks.

We also worked on the following priority issues: prevention of environmental disasters and accidents, promotion of energy consumption reduction and resource conservation, prevention of accidents with vehicle equipment, prevention of chemical transportation/handling issues, and promotion of white logistics.



"Mimamori-kun" advanced operation information system



Advanced Emergency Braking System

Group Companies outside Japan

SINO-JAPAN CHEMICAL CO., LTD. (Taiwan)

Principal business Manufacture and sale of surfactant and other chemicals

A Pre-Start-up Safety Review (PSSR) is recommended by U.S. OSHA rules, the American Institute of Chemical Engineers / Center for Chemical Process Safety (AIChE/CCPS), and the American Petroleum Institute (API). Sino-Japan Chemical has adopted and implemented PSSR as a control method to enhance process safety and facility reliability. In the chemical industry, serious accidents often occur at the time of introducing new equipment, launching new products, changing processes, or changing raw materials. In our plant, we consider PSSR to be important and have established review processes for new equipment, new processes, new materials, and new products. To further enhance the safety of equipment, our safety review team checks engineering measures and management measures prior to start-up, in addition to PSSR.



Pre-start-up safety review

Interview

Risk assessment of production processes

At the Linyuan Plant, we mainly use HAZOP (Hazard and Operability Analysis) to perform risk management of production processes. With a method taken by a major manufacturer in Taiwan as a guide, we had identified risks, but the method was not suitable for our plant.

Since production processes at our plant differ depending on the step of input of raw materials, replacement, synthesis, etc., we prepared a facility map and an operating procedure manual for each step, carried out HAZOP, and identified potential risks that had been overlooked. Since the fourth quarter of 2022, we have used the above method to carry out a re-assessment of important facilities.

We will continue to pursue safety initiatives based on the philosophy: "Safety takes priority over production."

Ho Cheng-Kuan

Senior Specialist and HAZOP Team Leader
Engineering Affairs Section,
Manufacturing Department
Sino-Japan Chemical Co., Ltd. (Taiwan)



NIPPON SHOKUBAI EUROPE N.V. (Belgium)

Principal business Manufacture and sale of acrylic acid and superabsorbent polymers

In 2022, as in the previous year, Nippon Shokubai Europe organized its second "safety week" during the periodic shut down maintenance in September to remind employees of the importance of ensuring their safety at work.

During this safety week, employees participated in a fire evacuation drill and a confined space rescue drill. For experiential safety education, a presentation about explosions was given by an outside expert. Within well controlled parameters, employees witnessed and experienced several vapor and dust explosions after a thorough explanation about how explosions occur and how to prevent explosions. The participants witnessed how small quantities of chemicals could generate a heat radiation and pressure wave. This event provided employees with a significant learning experience. In addition, initiatives related to the prevention of contamination and quality issues were also carried out.



Experiential safety education

Nippon Shokubai America Industries, Inc.

Principal business Manufacture and sale of superabsorbent polymers, polymers for concrete admixture, water soluble polymers, and acrylic emulsions

In 2022, both the Houston and Chattanooga facilities of Nippon Shokubai America Industries (NAII) achieved their goals of zero injuries with loss of workdays and zero environmental violations.

At the Houston facility, the slogan that won the top prize in the annual safety slogan contest was used on hardhat stickers and on a large banner to remind all employees and contractors of the importance of ensuring their safety at work.

At the Chattanooga facility, employees are working on several large-scale projects. The projects at the Chattanooga site and the large-scale periodic maintenance at the Houston site require the cooperation of several contractors in overhauling process equipment, building necessary infrastructure, and resuming production in a timely manner. In 2022, both facilities had no contractor injuries, thus meeting their objectives. Contractor safety will remain a top priority at both NAII locations.

Additionally, as part of its CO₂ reduction initiative, NAII switched to green electricity by wind power at the Houston facility through our joint venture American Acryl L.P. from November 2022.



Top prize-winning slogan for 2022

Initiatives of Group Companies

Group Companies outside Japan

SINGAPORE ACRYLIC PTE LTD

Principal business Manufacture and sale of acrylic acid

Due to the COVID-19 pandemic, Singapore Acrylic did not hold any physical emergency drills in or after FY2020, and instead only conducted tabletop exercises. We conducted our first emergency drill in June 2022 for the first time in three years, since primary COVID-19 measures had been lifted in Singapore from the second quarter of FY2022, in which we conducted hazmat and confined space drills with an external private fire brigade. Also in December 2022, together with the Singapore Civil Defence Force, we conducted a fire simulation around toluene storage tanks and performed a rescue operation of injured personnel.

In FY2022, to meet the National Environment Agency's tightened energy management regulations, we decided to implement an ISO 50001 energy management system to better address our energy management shortcomings and to also improve our overall energy consumption. We received professional guidance from an external consultant regarding the necessary documentation and training. We successfully obtained ISO 50001 certification.



Fire drill

NISSHOKU CHEMICAL INDUSTRY (ZHANGJIAGANG) CO., LTD. (China)

Principal business Manufacture and sale of superabsorbent polymers

Nisshoku Chemical Industry conducted a "Near Miss Kaizen" campaign in 2022, as in the previous year. A total of 181 suggestions (including 33 safety-related ones) were submitted. In the semiannual campaign, the teams that made the most and the second most suggestions per capita are commended.

In September, all employees of the company were given training based on past cases of injuries, and accidents that had occurred at the subsidiary companies of Nippon Shokubai in order to improve their safety awareness.

Twice-a-year emergency drills in collaboration with the local fire department and the emergency response center were conducted in June and December.

First-aid training with an external professional instructor was provided in November.



"Near Miss Kaizen Activity" awarding ceremony



First aid training

PT. NIPPON SHOKUBAI INDONESIA

Principal business Manufacture and sale of acrylic acid, acrylic esters, and superabsorbent polymers

In January 2023, PT. Nippon Shokubai Indonesia conducted emergency drills for a major earthquake disaster, consisting of Emergency Phase 1 (Field team by Shift Operation Members) and Emergency Phase 2 (Office team by Daytime Employees).

On the assumption of a major earthquake, all the employees participated in the Shakeout Drill (Drop, Cover, and Hold on!), in which the participants ensured their safety and then confirmed the safety of other employees and production facilities. In addition, based on a scenario where ethanol leakage and fire were found in the unloading area, the NSI Emergency Response Team that consists of the Office Team and the Field Team launched operations as stipulated in the Procedure. The Office Team was led by the Plant Manager, and the Field Team was led by the Shift Operation Supervisor.

The purposes of these drills are to train employees on initial response against an emergency situation and to enhance the firefighting skills of the Field Team and the command ability of the Office Team in order to contain the spread of damage and ensure safety and security. After the drills, a debriefing was conducted. We will strive to work on the issues identified through the drills and enhance our crisis-control capabilities.



Training of the Office Team



Training of the Field Team

About the RC Report 2023

This RC Report 2023 was prepared to go into more detail about our RC initiatives reported in the TechnoAmenity Report, which we began to publish in 2019.

In preparing this Report, we focused on increasing both simplicity and readability for ease of understanding by a wide variety of stakeholders.

Along with this RC Report 2023, we would recommend that you read the TechnoAmenity Report 2023. This integrated report covers our materialities, value creation process, business strategies, governance, and financial information to explain our Group's medium- and long-term value creation efforts to all of our stakeholders, including shareholders and investors, in an easy-to-understand manner.

Scope of This Report

Organization

(Unless otherwise stated, all provided data refers solely to Nippon Shokubai Co., Ltd.)

NIPPON SHOKUBAI CO., LTD.

Osaka Office
Tokyo Office
Himeji Plant
Kawasaki Plant
Suita Research Center
Himeji Research Center

Group Companies in Japan

NIPPOH CHEMICALS CO., LTD.
TOKYO FINE CHEMICAL CO., LTD.
CHUGOKU KAKO CO., LTD.
NIPPON POLYMER INDUSTRIES CO., LTD.
NISSHOKU TECHNO FINE CHEMICAL CO., LTD.
NIPPON NYUKAZAI CO., LTD.
Nisshoku Butsuryo Co., Ltd.

Group Companies outside Japan

Nippon Shokubai America Industries, Inc.
PT. NIPPON SHOKUBAI INDONESIA
NIPPON SHOKUBAI EUROPE N.V.
SINGAPORE ACRYLIC PTE LTD
NISSHOKU CHEMICAL INDUSTRY (ZHANGJIAGANG) CO., LTD.
SINO-JAPAN CHEMICAL CO., LTD.

Reporting period:

April 1, 2022–March 31, 2023

Some topics in and after April 2023 are also contained in the report.

Publication date:

November 2023

Third-party Verification Report on Greenhouse Gas Emissions



No.1811004587

Greenhouse Gas Emissions Verification Report

To: NIPPON SHOKUBAI CO., LTD.

1. Objective and Scope

Japan Quality Assurance Organization (hereafter "JQA") was engaged by NIPPON SHOKUBAI CO., LTD. (hereafter "the Company") to provide an independent verification on "FY2022" calculation report of GHG emissions" (hereafter "the Report"). The content of our verification was to express our conclusion, based on our verification procedures, on whether the Report was correctly measured and calculated, in accordance with the "Calculation manual of GHG emissions" (hereafter "the Rule") developed by the Company. The purpose of the verification is to evaluate the Report objectively and to enhance the credibility of the Report.

*The fiscal year 2022 of the Company ended on March 31, 2023.

2. Procedures Performed

JQA conducted verification in accordance with "ISO 14064-3" for GHG emissions, and with "ISAE3000" for energy consumption and Carbon Neutral City Gas purchase quantity. The scope of this verification assignment covers Scope 1, 2 as GHG (CO₂, CH₄, N₂O, CFC, HCFC, HFCs and PFCs) emissions, energy consumption and Carbon Neutral City Gas purchase quantity. The verification was conducted to a limited level of assurance and quantitative materiality was set at 5 percent of the total emissions in the Report. The organizational boundaries of this verification include ten production sites and four non-production sites of the Company and its group companies in Japan.

Our verification procedures included:

- Performing validation of integrated functions to check the Rule prior to the on-site assessment.
- Holding on-site verification at the Company's two domestic sites. The location of sampling sites for on-site assessment was selected by the Company.
- On-site assessment to check the Report's boundaries, source of GHG, monitoring points, monitoring and calculation system and its controls.
- Vouching: Cross-checking the GHG emissions, energy consumption and Carbon Neutral City Gas purchase quantity data against evidence for all sampling sites.

3. Conclusion

Based on the procedures described above, nothing has come to our attention that caused us to believe that the statement of the information regarding the Company's FY2022 GHG emissions, energy consumption and Carbon Neutral City Gas purchase quantity in the Report, is not materially correct, or has not been prepared in accordance with the Rule.

GHG Emissions	Scope1	Scope2	Total
Carbon Neutral City Gas purchase quantity	626 thousand tCO ₂ e	157 thousand tCO ₂ e	784 thousand tCO ₂ e
	28,000 thousand Sm ³ (15°C, atmospheric pressure)		

4. Consideration

The Company was responsible for preparing the Report, and JQA's responsibility was to conduct verification of GHG emissions, energy consumption and Carbon Neutral City Gas purchase quantity in the Report only. There is no conflict of interest between the Company and JQA.

Sumio Asada, Board Director
For and on behalf of Japan Quality Assurance Organization
1-25, Kandasakicho, Chiyoda-ku, Tokyo, Japan
September 6, 2023

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TechnoAmenity

Providing prosperity and comfort to people and society,
with our unique technology.

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Our corporate symbol
represents the spirit of
TechnoAmenity

- Hexagon ▶ One of the fundamental symbols used in chemistry
- Cosmo yellow ▶ Represents the hidden energy of the sun
- Earth green ▶ Represents the life-supporting nature of the earth
- Horizon between two colors ▶ Represents the future we always seek