

# TechnoAmenity Report 2020



November 2020

Dear readers of TechnoAmenity Report 2020

Yujiro Goto  
President and Representative Director  
Nippon Shokubai Co, Ltd.

## Notice Regarding the Cancellation of the Business Integration

NIPPON SHOKUBAI CO., LTD. and Sanyo Chemical Industries, Ltd. have held a series of discussions toward the business integration, and have agreed to the Cancellation of the Business Integration on October 21, 2020.

Because the business environment surrounding the Companies has rapidly and significantly changed after the execution of the final agreement concerning the Business Integration on November 29, 2019, such as significant changes in raw material prices and product prices as well as heightened uncertainty about product demand in the future, the Companies reached the conclusion that it has become difficult to conduct the Business Integration. Further, the Companies determined that, in light of the current business environment, exerting their respective strengths as independent companies will lead to enhancing the Companies' corporate value.

Based on our corporate group mission of "TechnoAmenity: Providing affluence and comfort to people and society, with our unique technology", our company will strive to achieve the goal of "Enriching people's lives in every aspect and contributing to the creation of a sustainable society for the future by always challenging uncharted fields as well as producing innovative and unique values" as the newly integrated company had taken aim. We would like to express our sincere gratitude to our shareholders, business partners, and many other stakeholders for their support and understanding to realize the Business Integration, although it did not happen. We would like to ask for your continuous understanding and support for our future business operations.

For more details, please refer to our website below.

<https://www.shokubai.co.jp/en/news/news0245.html>

<https://www.shokubai.co.jp/en/news/news0246.html>

## Editorial Policy

Starting from 2019, Nippon Shokubai has published “ **TechnoAmenity** Report ” to replace the CSR Report it has published up until 2018. The new report covers both financial information such as business plans and results, and non-financial information such as ESG (environmental, social, and governance) activities, which developed from Responsible Care (RC) activities.

This report aims to help a broad range of stakeholders understand our initiatives to achieve the Nippon Shokubai Group’s Mission “ **TechnoAmenity** – Providing affluence and comfort to people and society, with our unique technology.”

RC Report, which covers details of our RC activities, and major ESG data compiling numerical figures of our ESG initiatives are available on our company website. We recommend that you read them along with this Report.

## Scope of this Report

The report covers the entire Nippon Shokubai Group (consolidated). The report on Responsible Care activities covers Nippon Shokubai and its seven Group companies in Japan and the six overseas Group companies listed on P.65.

### Reporting period





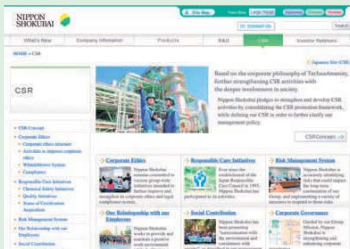
April 1, 2019 to March 31, 2020

Some topics in and after April 2020 are also contained in the report.

### Publication date

November 2020

## Overview of our Reporting Media

Financial data		Non-financial data	
<b>Booklet / PDF</b>	<b>PDF</b>	<b>Booklet/PDF</b>	<b>PDF</b>
			
<b>Financial Section</b> (English)	<b>TechnoAmenity Report</b> (Japanese/English)	<b>RC Report</b> (Japanese/English)	
<b>Website pages</b>		<b>Website pages</b>	
			
<b>IR data</b> <a href="https://www.shokubai.co.jp/en/ir/">https://www.shokubai.co.jp/en/ir/</a>		<b>CSR activities</b> <a href="https://www.shokubai.co.jp/en/csr/">https://www.shokubai.co.jp/en/csr/</a> <b>Major ESG data</b> <a href="https://www.shokubai.co.jp/en/csr/esg/">https://www.shokubai.co.jp/en/csr/esg/</a>	

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## Nippon Shokubai Group Mission

# TechnoAmenity

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

## Management Commitment

We conduct all of our corporate activities based upon a deep respect for humanity.

We aim at coexisting with society, and working in harmony with the environment.

We pursue technologies that will create the future.

We act on the global stage.

## Pioneering Spirit with Vision

Nippon Shokubai has been in business as a growing company for more than 70 years now. Our second president, Taizo Yatagai, who is actually the founder of the company and renowned as a “passionate entrepreneur,” laid the foundation for the development of the company. As a result of the persistent R&D efforts to develop the company’s proprietary technologies instead of introducing existing technologies from American corporations, Yatagai succeeded in manufacturing ethylene oxide at our Kawasaki Plant for the first time in Japan in 1959. The “pioneering spirit with vision” demonstrated by him has guided us as a compass in conducting our business activities.



## Corporate Credo

# Safety takes priority over production.

## Nippon Shokubai Code of Conduct

In the belief that it is our social responsibility to conduct business based upon the principles of compliance and self-responsibility for the sake of proper social development, we have set forth the following basic corporate behavior guidelines as the “Nippon Shokubai Code of Conduct.”

- ① Guided by our Group Mission of **TechnoAmenity**, we will conduct all of our actions as a good corporate citizen.
- ② We will comply with relevant laws both inside and outside of Japan, and act in accordance with in-house regulations.
- ③ We will create and nurture a sound, vibrant workplace, where each individual can hone their professional competence and find fulfillment in their career.
- ④ We will develop and market products and services that are both safe and useful, based upon an accurate understanding of social demands.
- ⑤ We will commit ourselves to eliminating labor hazards and accidents, and constantly strive to protect the global environment.
- ⑥ We will conduct business based on fair and open competition.
- ⑦ We will take a firm stance when dealing with unlawful or antisocial groups.
- ⑧ We will ensure frequent communications with our shareholders and members of society in general, and guarantee the appropriate disclosure of corporate information.
- ⑨ With respect for the culture and customs of every nation/region we serve, we will contribute to their development and wellbeing through community-based business undertakings.
- ⑩ We will ensure the solid and sustainable development of the company through business undertakings based soundly upon the above action guidelines.

## Creating New Values based on Inherited Corporate DNA

When the global financial crisis of 2008 hit, many companies had to cut back on capital investments. Instead, looking to the trends that would emerge after the crisis, at Nippon Shokubai we chose to expand our acrylic acid and superabsorbent polymers manufacturing facilities to continue supplying our customers with the products they needed. This indicates that our corporate DNA in the “pioneering spirit with vision” we have inherited since our founding lives on today. Based on this DNA, we will enhance our competitive advantage in a combination of R&D capabilities and production technology capabilities and create new, unprecedented value.

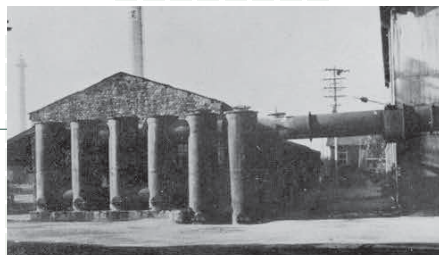
## History of Value Creation

Numerous chemical industry firsts in Japan and worldwide are testimony to our history of success in evolving our R&D and production technology capabilities. We are an innovative chemical company that leverages new and existing core technologies to provide customer solutions.

### First Commercial Production of Phthalic Anhydride

First  
in Japan

After developing a proprietary method to oxidize naphthalene using a vanadium catalyst, we were the first in Japan to commercially produce phthalic anhydride. Initially, demand for this product increased as a raw material for aircraft paints and plastics. Later, this key plasticizer for vinyl chloride resin contributed to the growth of the vinyl chloride industry. Home-grown technology underpins our operations as a chemical manufacturing company.



1941

1959

1970

### Successful Ethylene Oxide Production

First  
in Japan



polyester raw materials and detergent raw materials.

\*In Japan, we are a leading producer by volume.

### A New Acrylic Acid Production Process

First  
Worldwide

We were the first in the world to commercialize acrylic acid through direct oxidation of propylene. This enabled low-cost, high-volume acrylic acid production and derivative products including paint raw materials, adhesive raw materials and superabsorbent polymers. Leading acrylic acid manufacturers worldwide have adopted our production technology and catalysts.



\*We are one of the largest volume producers worldwide.

## Successful Mass Production of Superabsorbent Polymers

We began mass-producing superabsorbent polymers "AQUALIC CA™" in 1985 using acrylic acid as the raw material, and we continue to be the global technology and production leader in this market. Our superabsorbent polymers have excellent water absorption and retention of 100 to 1,000 grams of water per gram of polymer. Mainly used in disposable diapers, our superabsorbents improve quality of life and have also been used to prevent desertification.

**\*With a worldwide production system, we maintain our position as the world's top producer (as of April 2020, according to Nippon Shokubai research).**



1985

2006

First  
Worldwide

## High-performance Acrylic Resin ACRYVIEWA™ Commercial Production

We used our new polymer design technology to successfully commercialize ACRYVIEWA™, a unique acrylic resin with outstanding transparency, optical properties, and heat resistance. This high-performance material enables larger, thinner liquid crystal displays for televisions, smartphones, tablets and other devices.



First  
in Japan

## Commercial Production of ZIRCOSTAR™ The Dispersion of Highly Concentrated Zirconia Nanoparticles

We used our unique technologies to develop ZIRCOSTAR™, the Dispersion of highly concentrated Zirconia Nanoparticles. These zirconia nanoparticles can be dispersed in various organic solvents and resins in high concentration. Resins in which these nanoparticles are dispersed demonstrate good optical characteristics that are not possible with conventional materials (including a high refractive index and high transparency). ZIRCOSTAR™ is used for optical materials such as plastic lenses and displays, as well as for electronics materials.



2015

2012

## Mass Production Technology for IONEL™ electrolyte for lithium-ion batteries

First  
Worldwide

We devised the mass-production technology for IONEL™ using proprietary synthesis and refining techniques. IONEL™ is an electrolyte for lithium-ion batteries that effectively improves the cycle life, charge/discharge performance and low temperature performance, and reduces cell bulging at high temperatures. Also used in automotive battery applications, we expect this product to be a driver of future growth.

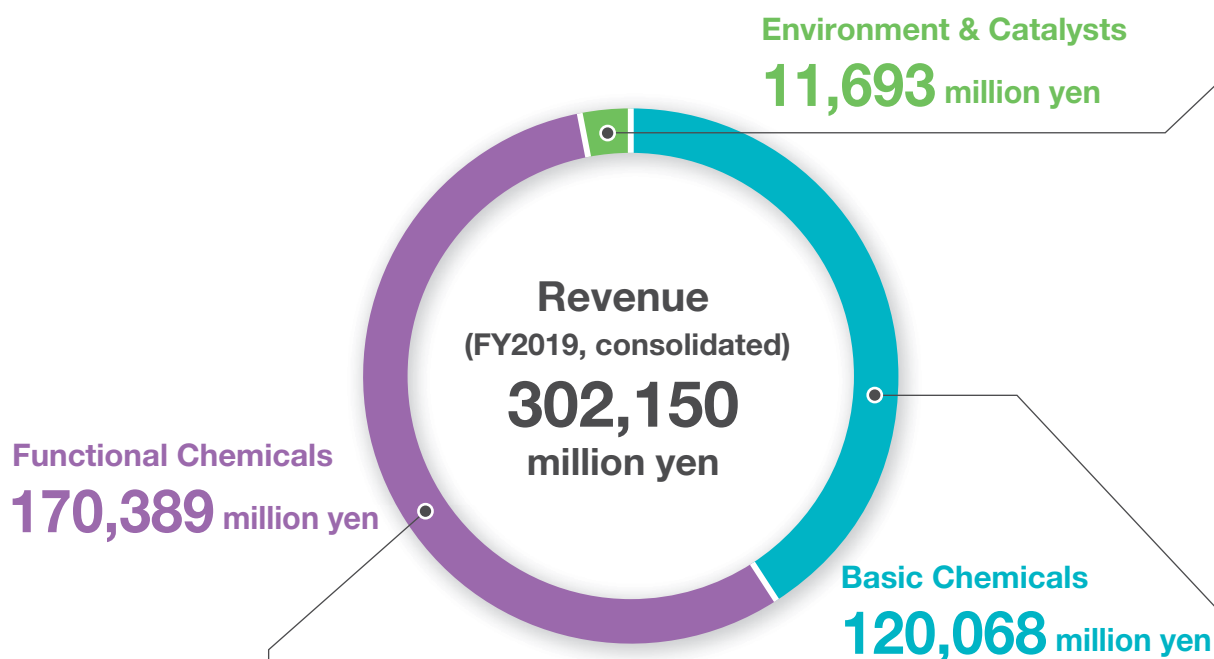


**Making society affluent and comfortable by continuously providing value with our technological capabilities**



## Nippon Shokubai's Businesses

Nippon Shokubai operates businesses in three segments: basic chemicals, producing chemical raw materials for a variety of fields and processes; functional chemicals, producing a variety of derivative products from raw materials using our unique technologies; and environment & catalysts, developing and producing catalysts, which is the origin of all our businesses today; thereby contributing to realizing a sustainable society as valued partner for customers.



### Functional Chemicals

From basic chemical raw materials such as acrylic acid and ethylene oxide, our functional chemicals business uses our unique technologies to produce and sell a range of high value-added derivative products. Our products, including our superabsorbent polymers, or SAP (AQUALIC CA™), high-performance acrylic resin (ACRYVIEWA™) and polymers for concrete admixtures (AQUALOC™), contribute to the reduction of environmental impact and the creation of an affluent society.

#### Major relevant SDGs



#### Major products

Applications in parentheses



AQUALIC CA™ (disposable diapers)



ACRYVIEWA™, ACRYCURE™, etc. (LCDs)



VEEA™ (UV inkjet printing)



AQUALOC™ (polymers for concrete admixtures)

#### Close Up

#### Top SAP producer in the world

Our SAPs (AQUALIC CA™), which absorb 100 to 1,000 grams of water per gram of polymer, are not only used as the material in disposable diapers, where they help to reduce the work involved in childcare and nursing care, but also to improve the water retention capacity of soils threatened with desertification, proving useful in the area of environmental protection. With a production capacity of 710,000 tons, we are the top producer in the world.

**Production capacity 710,000 tons/year**

## Environment & Catalysts

Our environment & catalysts business produces and sells products that contribute to conservation of the environment, including De-NO<sub>x</sub> catalysts and dioxin decomposition catalysts for the purification of exhaust gas from power plants and waste incinerators, and wastewater treatment catalysts for catalytic wet air oxidation, capable of efficiently oxidizing and decomposing harmful substances in wastewater from plants. The environment & catalysts business also contributes to reducing both energy consumption and greenhouse gas (GHG) emissions through electrolyte sheets for solid oxide fuel cells and other products.

### Major relevant SDGs



### Major products

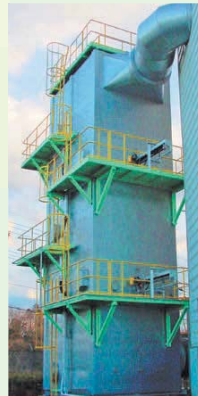
Applications in parentheses



IONEL™ (lithium ion batteries)



Electrolyte sheets for solid oxide fuel cells



Catalytic dioxin decomposition and removal system

### Close Up

### IONEL™ attaining a high market reputation

Our electrolyte LiFSI (Lithium bis (fluorosulfonyl) imide, IONEL™), which dramatically improves the performance of lithium ion batteries installed in electric vehicles (EVs), has attained a high market reputation. We are planning to boost the production volume to respond to the expected future increase in demand.

## Basic Chemicals

Our basic chemicals business covers acrylic acid and ethylene oxide, as well as their derivative products. Derivative products of acrylic acid include acrylates, used mainly for paints, while derivative products of ethylene oxide include ethylene glycols, used as raw materials for PET bottles and polyester fibers, and secondary alcohol ethoxylates (SOFTANOL™), which are effective in improving the performance of detergents.

### Major relevant SDGs



### Major products

Applications in parentheses



Acrylates (paints)



Acrylates (adhesives and tackifiers)



Ethylene glycols (PET bottles)



SOFTANOL™ (detergents)

### Close Up

### One of the leading acrylic acid producers in the world

Our unique catalysis and production technologies have enabled a high-quality, stable supply of acrylic acid, which is used as a raw material for SAPs, acrylates and other chemicals in various fields and applications. We maintain the position as one of the leading producers in the world, capable of responding to the expected future increase in demand in the long run.

Production capacity **880,000** tons/year

# Nippon Shokubai's Products Used in Daily Life

Chemicals that Nippon Shokubai deals with are transformed into materials and products that help make our lives convenient and comfortable in all activities involving food, clothing and housing, and are indispensable in various parts of our daily lives.



## SOFTANOL™ Secondary alcohol ethoxylates

A non-irritant and biodegradable surfactant effective in improving the performance of detergents for kitchen and clothing and reducing the environmental impact of wastewater.



## AQUALIC CA™ Superabsorbent polymers

A chemical product capable of absorbing 100 to 1,000 grams of water per gram of polymer, used as the main material in disposable diapers, helping to reduce the work involved in childcare and nursing care.



## UWR™ Resin for paints

Unprecedented resin for paints having super weather resistance and high gloss, used in paints for construction materials and building exteriors, and as various coating materials.



## Ethylene glycols

Used as raw materials for PET resin, for PET bottles with high resilience and transparency, and also for polyester fibers.

## EPOCROS™ Oxazoline-functional polymers

Performance polymers with excellent adhesion to films and substrates, used as an environment-friendly water crosslinker for liquid crystal displays.

## ACRYVIEWA™ Acrylic resin for optical films

A performance polymer with high transparency, optical performance and heat resistance, contributing to the development of larger and thinner liquid crystal displays.



## VEEA™/AOMA™ Monomers for UV/EB curable materials

Highly diluent and UV curable monomers used for QR code printing, which requires high precision, and printing of labels for cosmetics.



**EPOMIN™**  
Polyethyleneimine

Water soluble polymer that has the highest cation density and reactivity among existing materials, used at wastewater treatment facilities in response to tighter environmental regulations.

**AQUALOC™**  
Carboxylic acid polymers for  
concrete admixtures

Comb-shaped polymers that reinforce concrete with excellent dispersibility, used for large bridges and roads, which must be safe and durable.

**Dioxin decomposition  
catalysts**

Decompose dioxin contained in exhaust gas from waste incinerators, etc. into harmless carbon dioxide or water.

**Electrolyte sheets for  
solid oxide fuel cells**

Contributing to improving the performance of solid oxide fuel cells, as well as to promoting energy saving and reducing GHG.

**IONEL™**

LiFSI (Lithium bis (fluorosulfonyl) imide)

Used as the electrolyte for lithium ion batteries and is effective in improving the performance of batteries across a broad temperature range, and used also in batteries for electric vehicles.

**Specialty acrylates**

A monomer serving as a material in high-performance paints, used for the topcoating of vehicles, contributing to the protection of car bodies.

# Commitment to Value Creation

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Aiming to respond to rapidly changing market needs and solve emerging social issues, Nippon Shokubai is committed to the ceaseless pursuit of value creation by bolstering its competitiveness through the fusion of its R&D capacities and production technology capabilities and creating “amazing materials” that are useful to society.

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## Message from the President

**The origin of value we offer should be a “story” that tells how it would be really useful for society, with compassion for others.**

Yujiro Goto, President

*Yujiro Goto*



### Understanding changes in the external environment

**Where all the environmental factors surrounding us are unpredictable, we make both proactive and defensive preparations**

In fiscal 2019, the world economy experienced a remarkable slowdown, which seriously affected our company. Natural disasters, including typhoons in Japan and massive bushfires in Australia, also caused devastating damage not only to human beings and ecosystems but also to the world economy. In addition, the impact of the COVID-19 novel coronavirus pandemic may further worsen the global economic situation if it is prolonged.

In 2009, when there was an outbreak of a novel influenza, Nippon Shokubai formulated BCPs (business continuity plans) and other enhanced measures to tackle the situation. We established a system of phases starting from the emergence of the virus and determined specific actions to be taken in each phase; especially what the plants should do and how the inventory of important products should be maintained—which I clearly remember as I led this initiative at that time. We

shared the information about these measures with our customers, thereby establishing relationships of trust with them.

This year, according to these plans and measures we have formulated, we set up a company-wide emergency task force as an organ to flexibly discuss the actions that the Company should take. The government declared a state of emergency and the impact of the novel coronavirus affected our business operations. With a sense of mission as a business operator indispensable for our society while understanding our social responsibility to ensure the safety of our employees and help prevent the infection from spreading in our communities, we are making Group-wide efforts to continue to supply our products.

This situation, where all the environmental factors surrounding us are unpredictable, has thus reminded us of the importance of preparation.

## Progress in the second half of “Reborn Nippon Shokubai 2020 NEXT,” our medium-term business plan

### With both sales and profits way below their targets in FY2019, we will continue with our investments for the future and promptly take new actions

For the second half of our medium-term business plan covering FY2017 through FY2020, we have set numerical targets for the final year FY2020 (400 billion yen for sales revenue, 40 billion yen for profit before tax, and 7.4% for ROA). However, it now seems highly difficult to achieve these targets.

One of the reasons for this is the significant changes in the external environment. While construction of large petrochemical plants are under way or being planned in China, the Middle East and Southeast Asia, the Shale Revolution in the U.S. has caused an inflow of cheaper products into Asia, upsetting the balance between supply and demand. Moreover, with the escalation of the US-China trade conflict, sales of our products became stagnant and selling prices frequently fell, particularly in Asia. The sense of uncertainty about the future of the chemical industry as a whole and geopolitical risks in the Middle East and Southeast Asia caused a drastic fluctuation in the prices of raw materials. This reduced the margin between prices of raw materials and products, resulting in a significant decrease in profits.

Another reason, which is related to our internal environment, is the impact of the delay in creating new businesses and new products under the plan. However, we have been steadily advancing strategic actions, including the establishment of development systems and M&A investments. I see these actions are gradually blossoming, though with a bit of a delay, and I feel that the future outlook is becoming much clearer.

### Accelerating the creation of new businesses and products

An example is IONEL™, our electrolytes for lithium ion batteries, which have attained a good reputation in the market. Starting from 2023, we plan to first raise the production capacity for this product to some thousand tons, 10 times the current capacity. Paying attention to market trends, we are making preparations so that we

can make timely decisions as soon as the conditions are met. After that, we will need sufficient capacity for tens of thousands of tons in the future. Then, we will be required to further improve the production processes and technologies in order to provide the product at prices that can satisfy stricter market demand.

I think that for batteries using IONEL™, such as lithium ion batteries, simply selling products is not enough to be successful. The key to this business is developing a “system of circulation” that covers all stages including recycling after making and selling the product. Also, batteries are made with various materials. We need to think deeply about our unique technologies that can bridge them. Besides lithium ion batteries, we are currently working on different types of batteries, such as zinc batteries and fuel cells, and we have access to various useful information. We will find our strengths that will enable us to contribute to the “system of circulation.”

### Expansion into growing markets

As to global markets, we focus on Asia, of course. Southeast Asia and India, in particular, are areas with tremendous growth potential. Asian countries are close to Japan in terms of both distance and culture, which makes it relatively easy for us to do business. We will therefore place greater emphasis on markets in this area.

In Europe, on the other hand, we need to be more careful in doing business, and marketing and production activities should be promoted in cooperation with local companies. At present, Nippon Shokubai has an operation site in Belgium, but trying to do everything by ourselves may even increase costs.

Moreover, acrylic acid and SAP are the major products that our overseas operations deal with, which are often significantly affected by economic trends. I think further growth can be expected if we enhance the product lineup for overseas markets.

### Outline of the Medium-term Business Plan

Business Policies		Priority Challenges		Basic Posture	
<ul style="list-style-type: none"> <li>Focusing on profitability over sales</li> <li>Safe, reliable production activities</li> </ul>		<ul style="list-style-type: none"> <li>Survival of SAP business</li> <li>Launch of new businesses in high-growth potential markets as our future key driver</li> </ul>		Create products and services which market needs, and provide the products and the services when market needs.	
Numerical targets for 2020 (IFRS)*		Sales revenue	400 billion yen	Sales increase during the period: 106.0 billion yen (Sales revenue: 294 billion yen in FY2016 → 400 billion yen in FY2020)	
		Profit before tax	40 billion yen	(profit margin on sales revenue: 10%)	ROA 7.4%

\* Starting from fiscal year ended March 2019, Nippon Shokubai has voluntarily adopted the International Financial Reporting Standards (IFRS) for consolidated financial statements in the securities report. Accordingly the figures for numerical targets have been adjusted.

## The Business Integration will give us a vision for 10 years ahead.



### Business integration with Sanyo Chemical Industries, Ltd.

## Two companies sharing common aims and objectives Complement each other's strengths and challenges for further growth

The biggest management decision made during fiscal 2019 was regarding the business integration with Sanyo Chemical Industries, Ltd. (hereinafter, "Sanyo Chemical"). The two companies will share common objectives and work hard on an equal footing. I really think this is a significant achievement.

What enabled our decision to proceed with the business integration is, first, that the respective group missions and management mottos of the two companies, which focus on contributing to society through corporate activities, are highly compatible, and also, that the strengths and challenges of the two companies make it easy to form a mutual complementary relationship. Specifically, Nippon Shokubai's strength is having a value chain of integrated production for all types of chemical products from basic chemicals to functional chemicals while its challenge is to create new businesses reflecting the needs of users. Sanyo Chemical's strength, on the other hand, is in the solutions business, in the manufacture and sale of many performance chemicals to solve the problems of customers, but its procurement of major raw materials depends heavily on external sources. We will take advantage of the strengths of the two companies and create a synergy effect. It will lead to further growth and also accelerate this growth. This is what I really expect.

As part of the final goal of the second half of the Medium-term Business Plan, I have told our employees that we should have a vision of the steady growth

expected for the next 10 years. I believe that this Business Integration will help us have such a vision.

### Accepting differences and learning from each other

Sanyo Chemical celebrated its 70th anniversary in 2019 and Nippon Shokubai will celebrate its 80th anniversary in 2021. Both are companies with long histories and unique cultures cultivated throughout their respective histories. If the employees of the two companies respect and take advantage of these differences in taking on challenges, we can make our companies much better. I am sure this is a big chance for change. We are extremely excited about creating a good company, not as an extension of the past but as a totally new company.

As to learning from each other, for example, Sanyo Chemical has approximately 3,000 types of functional products and forms a team for each of them so that they can respond to customers quickly. I feel that we can learn a lot from such marketing and communication approaches and methods. Sanyo Chemical also works on diversity issues in a manner different from Nippon Shokubai. Thus, although there are differences in approaches, the two companies can join their strengths. We need to change our awareness, including having a sense of compassion and modesty, so that we can make diversity a driving force of our organization.

## Taking advantage of the strengths of the two companies, we will challenge new markets

We will aim at, for example, niche markets. I hope that a fusion of the two companies' technologies will provide us with new inspiration for pioneering undiscovered fields. We will always take the customers' point of view and look deeply into the needs of our customers.

One of the new fields that the two companies will jointly promote is energy. Sanyo Chemical is working on the development of all-polymer batteries while Nippon Shokubai is working to globally expand its business for IONEL™, our electrolytes that can be used for all-polymer batteries. We are also planning to deal with separators and various other materials for batteries. Thus, I am sure that our integrated company can make a significant contribution in the field of energy.

Another field is life sciences. Nippon Shokubai has been making preparations for the launch of contract

manufacturing of APIs for middle-molecule (nucleic acid and peptide) drugs. Sanyo Chemical, on the other hand, is not involved in the medical materials business but has been advancing R&D activities targeting the fields of hemostatic materials and medical devices used in surgery.

On a global scale, Sanyo Chemical has several operation sites in Asia, such as business sites in Thailand and Malaysia and a plant in Korea. It also has a site in China, which is larger than our site there. On the other hand, Sanyo Chemical has no operation bases in Europe. Therefore, we are thinking of doing something with our sites. Anyway, after the integration, we can utilize the sites of both companies and seek new possibilities. This is really a good opportunity for us.

## Targeting sustainable growth

### Revitalize our organizations by effectively utilizing human resources, our greatest assets

I believe that the most important role of management is to respect people and help them grow. The training of leaders and managers, for example, is highly important for our future business management and we will continuously focus on this area. Although the detailed content of training programs vary depending on the job type, the common approach is gathering people from different departments as much as possible and having them discuss various ideas.

Starting from fiscal 2019, we have also been promoting the use of AI. In fiscal 2020, the organization in charge was renamed DX\* Promotion Team, consisting of members who are passionate and competent gathered from throughout the company. The Team has started working actively, with members thinking about what they can do and what they want to do.

Furthermore, we are enhancing initiatives to promote diversity. In fiscal 2019, we launched a project to promote women's participation and advancement in the workplace. The project members, who are female employees in managerial positions, identified problems and proposed measures. In view of the problems pointed out in the project, we will consider and carry out various diversity-related measures as part of our work innovation activities

\* Digital transformation







**With an awareness of the large system of circulation, we will firmly determine our position.**

## Raison d'être of Nippon Shokubai

### **Become a company that can play a necessary part in a society committed to recycling and then support “affluence of the mind”**

To avoid becoming just a seller of goods, we must determine the position of our work in a recycling-oriented society. If we can see our position in the whole system, we will be able to contribute to an overall solution instead of being caught up in partial solutions.

It is often said that we should “create a story” when working on a new theme. However, I am afraid that the story we create may be stereotypical or not interesting. Instead, we should create a “story” that tells how this will really make society happy or how it will ease the suffering of people with compassion for others. If we can create such a story, it will enable us to offer our unique value and also raise our own corporate value.

Underlying this is our Group Mission “**TechnoAmenity** – Providing affluence and comfort to people and society, with our unique technology.”

We should not only help people and society become more affluent and comfortable with technology, but also be more aware of the importance of solving social issues.

This is consistent with the sustainable development goals (SDGs).

If a company creates jobs that makes employees more motivated, the employees will work enthusiastically with pride in the company. I think that such a company spontaneously attracts competent people. Our previous president often said, “Think whether it is good or bad, not whether it will make a profit or loss, if you have difficulty in making a decision,” and I inherited this attitude. I feel that this attitude is also consistent with the approach of finding a solution in a “story.” We pursue not only profits but also the “goodness” of easing the real pain and suffering of people and finding solutions for them. I hope such a raison d'être, or value of our company will be known to our stakeholders.

We, as Nippon Shokubai and our new company Synfomix, will make continued efforts to constantly contribute to the creation of a sustainable society.



## Nippon Shokubai's Value Creation

Under the Group Mission “**TechnoAmenity** – Providing affluence and comfort to people and society, with our unique technology,” Nippon Shokubai conducts business activities in each of its business sectors. Based on the “pioneering spirit with vision” which we have inherited since our foundation, we create innovative products with competitiveness realized by fusing our unique R&D capabilities and production technology capabilities.

### Changes in people and society

#### Social issues facing the world

- Resources and energy problems
- Environmental problems
- Food and water problems, population increase
- Improving the health, comfort, and quality of life
- Technology innovations, such as AI and IoT

#### Changes in market needs

- **Energy**  
Energy saving and energy storage  
Post-fossil fuels
- **Automobiles**  
Reduced environmental impact and less weight
- **Food and agriculture**  
Increased production and improved work efficiency
- **Medical materials and consumer products**  
Improved functions
- **Electronic information materials**  
Materials with further advanced functions

### Competitiveness

## Core Competence → P.19-20

With unique catalyst technology and integrated production systems, we are capable of providing high value-added materials with various functions stably, efficiently and in large quantities.



## Pioneering Spirit with Vision

## Vision and Strategy

## Vision

## Vision for 2025



An innovative chemical company that provides new value for people's lives

## Strategy → P.26

## The second half of the medium-term business plan

## “Reborn Nippon Shokubai 2020 NEXT”

## Numerical targets for 2020 (IFRS)\*

- Sales revenue: 400 billion yen
- Profit before tax: 40 billion yen (profit margin on sales revenue: 10%)
- ROA/7.4%

\* Starting from the fiscal year ended March 2019, Nippon Shokubai has voluntarily adopted the International Financial Reporting Standards (IFRS) for consolidated financial statements in our securities reports. Accordingly the figures for numerical targets have been adjusted.

## CSR Medium-term Targets

- Priority issues: Corporate ethics, Responsible Care, risk management, human rights and labor, information disclosure, social contribution, corporate governance

## Business → P.27-34

## New business target sectors



## Value provided

## Value → P.27-34

## Comfortable lifestyle

Help achieve a convenient and comfortable lifestyle with superabsorbent polymers and electronic information materials.

Superabsorbent polymers (AQUALIC CA™)  
Detergents (AQUALIC™ L, SOFTANOL™)  
Acrylic resin for optical films (ACRYVIEWA™)

## Climate change mitigation

Reduce energy consumption by offering high-performance materials and commercialize next-generation energy.

Electrolytes for lithium ion batteries (IONEL™)  
Electrolyte sheets for solid oxide fuel cells  
Raw materials for new paints (methylene malonates)

## Environmental purification

Contribute to solving environmental issues by efficiently removing hazardous substances in wastewater or the atmosphere.

Waste gas and wastewater treatment catalysts, automotive catalysts, denitrification catalysts, water treatment agents (EPOMIN™, etc.)

## Health and beauty

Join the pharmaceutical and cosmetic business markets to contribute to a healthy and comfortable lifestyle.

Drug development support business, cosmetics business

## Nippon Shokubai's Competitive Advantage

Nippon Shokubai's competitive advantage comes from a fusion of its unique R&D capabilities and production technology capabilities. R&D capabilities in the three core technology fields of inorganic & catalysts, polymers, and organic synthesis, and production technology capabilities based on the know-how accumulated within the Company, are the two pillars that have enabled us to generate products that meet a broad range of demand from our customers and maintain a competitive advantage in terms of quality and cost. We will also create innovative products that are competitive in new sectors/areas by utilizing these accumulated technologies.

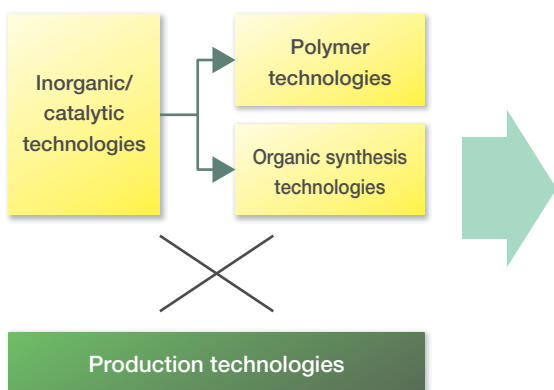
### Source of Competitive Advantage



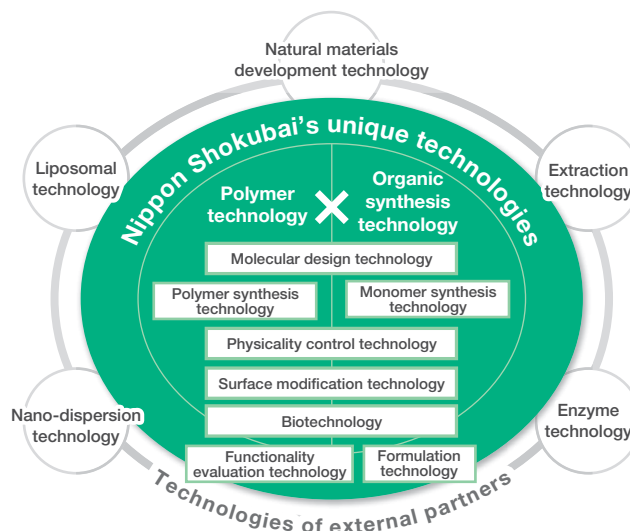
Nippon Shokubai has developed "catalysts," which are indispensable for manufacturing chemicals, and has continuously honed technologies that contribute to their development. At the same time, the Company has expanded their application as environmental catalysts and process catalysts. Moreover, we develop and produce high value-added functional chemicals from basic chemicals produced in our internal processes, such as acrylic acid and ethylene oxide, as raw materials. By organically connecting all these elements, we create "amazing materials" that are useful to society.

### How a new business or product is created

<Case study in the area of cosmetics>



### Combination of our unique technologies and technologies of external partners



Nippon Shokubai's fundamental technologies

Technologies created in new sectors/areas

## Competitiveness

### Creating products in new sectors/areas

To create innovative products in new sectors/areas, we are accelerating needs-oriented R&D activities based on external partnerships, such as joint research with universities both in Japan and overseas and collaboration with venture businesses that have promising technologies, in addition to making effective use of the findings in our basic and applied studies we have accumulated.

### “Amazing materials”

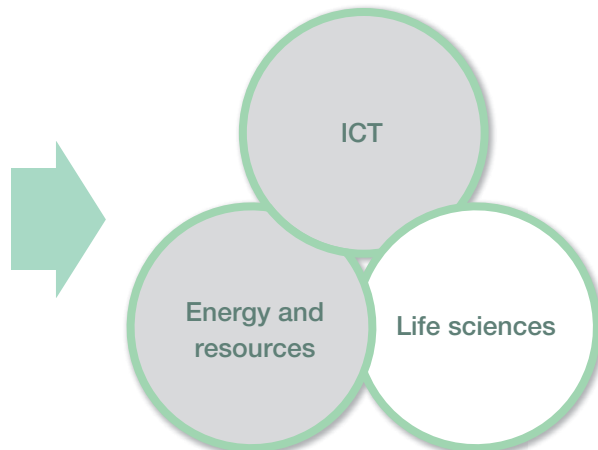
### Competitive advantage in quality and cost

By pursuing proprietary processes for all stages from production technology development to commercial production, we can manufacture high-quality products stably and efficiently, in a timely manner and in large quantities, and at reduced cost. We are also working to enhance our competitive advantage by improving production technologies and cost management utilizing DX.

### Meeting a wide range of demand

Employing the inorganic and catalytic technologies we have cultivated, the polymer technologies required to design and manufacture monomers with various functions and unique polymers, and organic synthesis technologies required to design and manufacture unique chemical compounds with special functions, we develop products that can precisely meet the real needs of customers.

### New functional cosmetics materials



New “amazing materials”

New business



## Management Talk

### What is the competitive advantage unique to Nippon Shokubai generated from the “synergy” between R&D capabilities and production technology capabilities?



**Nippon Shokubai's strength lies in its unique R&D capabilities and production technology capabilities based on internally accumulated know-how.**

**Kanaida:** Nippon Shokubai, based on the unique chemicals and raw materials it has created with its proprietary catalysis technologies, has developed high-performance derivatives and polymers by combining organic synthesis and polymer technologies and production process technologies, and has created materials indispensable for various products familiar in our daily lives.

This was enabled by the fact that we have not only proprietary technologies but also researchers with a mindset open to collaborations across the boundaries of departments and sectors. Multi-layered R&D activities, which can support diversification and stabilization of our revenue base, are a strength of our company.

To maintain and reinforce this strength, we must develop competent human resources. For young researchers, in particular, job rotation is promoted not only within the same field but they are often transferred to different fields. For example, researchers of catalysts may be transferred to polymer design. They are also assigned at least once to a department or theme close to customers with the aim of helping them cultivate broad and multifaceted perspectives. I think this is a unique feature of our human resources development.

**Iriguchi:** Talking about production technology capabilities, since its foundation, Nippon Shokubai has developed technologies within the company, and has been actively involved in all processes up to production, including production process design/building, equipment design, and construction. This is the major feature of the Company. When constructing a new plant, we have never simply copied an old plant, something which we are proud of.

Meticulously examined know-how has been accumulated over a long time to satisfy customer demand for quality and quantity, which has led to subsequent facility improvements and technology innovations. We have

**Through research on seeds for new technologies across different sectors and persistent exploration of applications, we will create chemical products that can satisfy diverse customer needs and contribute to the SDGs.**

### Kenta Kanaida

Executive Officer  
Innovation & Business Development Division



products in a timely manner and precisely responding to rapidly changing market needs. This is a strength of Nippon Shokubai. And this results in an improved relationship of trust with our customers.

Acrylic acid is one of our core products, and we have one of the world's highest production capacities. It requires a highly difficult technique to produce acrylic acid safely and stably because of its high reactivity (polymerizability). We have thoroughly honed our production technology capabilities to achieve both the world's highest quality level and cost reduction, thereby surviving the fierce competition in the market.

**The combination of R&D capabilities and production technology capabilities has created a synergy effect, resulting in improved competitiveness**

**Kanaida:** Nippon Shokubai has a competitive advantage with its superabsorbent polymers (SAP) and other unique products. I think this is due to the synergy between its R&D capabilities and production technology capabilities. For example,  $\alpha$ -hydroxymethyl acrylate (hereinafter, RHMA) is a key monomer for ACRYVIEWA™ acrylic resin for optical materials, but its possible applications were limited and not clear in the early stage of research. Nippon Shokubai discovered a novel reaction system for RHMA synthesis using amine catalyst, which resulted in the establishment of a useful industrial production method. Moreover, intramolecular cyclization reaction using RHMA polymer, a unique technology, was established. This technology enabled us to obtain new RHMA based polymers with excellent heat resistance, satisfying the needs of optical materials and leading to successful commercialization. This is a successful example of the combination of new technologies in different fields as I mentioned earlier.

However, it was actually not easy to establish a new plant for completely new monomers and polymers in a timely manner.

**Iriguchi:** It is normally not easy for production sites to start handling a new monomer or polymer because

**Even with special chemicals, we will continue to create products unique to our company by employing technologies to ensure safe and stable production and new technologies including DX.**

## Jiro Iriguchi

Member of the Board, Managing Executive Officer  
Production & Technology

there are concerns about lack of knowledge or safety. Fortunately, however, the Himeji Plant had plant equipment to produce similar special monomers and polymers in small quantities and they were familiar with the processes. Therefore, they were able to flexibly handle the new chemicals even though they faced many difficulties. This demonstrates their accumulated efforts in daring to deal with special materials, which enabled them to build a large plant while introducing new technologies to accomplish the task.

**Kanaida:** A unique seed discovered on the research side was found to have excellent transparency, optical performance, heat resistance, etc. in the course of a persistent search for applications on the development side, and was consequently recognized as an important material that improves the performance of liquid crystal displays. And the research center, Production Technology Center, and the production site worked in collaboration to run the PDCA cycle to promptly establish a production system capable of responding to high demand for optical films, thereby providing a competitive advantage against competitors.

**Iriguchi:** This experience has proved that even with chemicals that our competitors may hesitate to handle due to concerns about safety and stability, Nippon Shokubai has the R&D capabilities to create new products and production technology capabilities to safely handle, produce, and supply products with stable quality. Thus, we see that “amazing materials” generated from the synergy between R&D capabilities and production technology capabilities have developed into highly profitable businesses over a long period of time with high barriers to entry for our competitors.

### Accelerate the development of new businesses and products to enhance competitiveness, thereby creating new value

**Kanaida:** Amid increasingly intensifying competition, speed, new vision, and an optimal business strategy are required more than ever before in developing a new business or product. We are strongly aware of the need to accelerate measures to this end and have actually taken several actions.

In the life sciences segment, construction of an API (Active Pharmaceutical Ingredient) synthesis production facility was completed at Suita Research Center (Suita City, Osaka) in 2019, where preparations are being made to launch contract manufacturing of oligonucleotide and peptide drugs. In the ICT and energy & environment

segments, task force activities for business creation focusing on preparation of commercialization scenarios have contributed to finding several promising themes. Specific approaches vary among segments. The life sciences segment is working with a long-term perspective in employing sufficient resources, the energy and environment segment is trying to catch up with the speed of growth of the market, and the ICT segment is working to create unique products by utilizing the proprietary technologies of the Company. Some of their themes will reach the commercialization stage by the end of fiscal 2020.

**Iriguchi:** In line with the research side accelerating their activities to create new themes, the production side is also required to give them concrete shape as quickly as possible. For this, I am strongly concerned about the inevitable impact of the aging population and declining birthrate on our manufacturing sites. Prolonged work periods and rising costs at construction companies have already become real problems. It will be difficult in the near future to secure a sufficient number of operators for each manufacturing site. What will make the difference are the production technology capabilities that enable continued production without causing any problems, even if manpower is reduced, while ensuring stable production and cost reduction as we have done so far, as well as the maintenance capabilities to support them.

**Kanaida:** At present, we are doing business in a number of new areas such as medicine and cosmetics. For these businesses, we need to have a new way of thinking in all aspects, including the scale of business and management standards, which is totally different from the one we have for manufacturing. To this end, it is necessary to further integrate R&D and production technology processes and find ways to introduce necessary ideas and technologies, including mid-career recruitment of specialized personnel, instead of relying too much on our proprietary technologies and knowledge. We are thus trying to change our mindset for further advancement.

**Iriguchi:** I think that it is also increasingly important to promote DX (digital transformation). Workers on production floors are required to have the ability to use new sensing techniques and utilize big data for the stabilization of their plants, and preparations in this regard are being made.

**Kanaida:** In R&D, we provide young researchers and development personnel expected to lead the next generation with many opportunities for exchanges with external parties. Exchange programs include transfer to the R&D center of Nanyang Technological University in

Singapore, a U.S. venture firm that Nippon Shokubai has acquired, and a venture capital. Through these opportunities, young researchers develop their ability to determine partners suitable for Nippon Shokubai and the ability to cooperate with others. In the past, industry-academia collaborations were based on one-to-one relationships between, for example, a university professor and a corporate researcher. Today, however, we pursue relationships between two organizations—a university and Nippon Shokubai—in other words, an n-to-n relationship, with the aim of achieving synergies between a broader range of fields. This is a big change.

**Iriguchi:** Recently, to have a medium to long term perspective, it is considered important to be strongly aware of social requirements, such as the SDGs. How is this trend reflected on the R&D front? Have any specific measures been implemented?

**Kanaida:** Well, according to the current medium-term business plan for the second half, we not only examine market potential and suitability for the company but place high priority on social needs when considering the launch of a new business or a new product. We clearly indicate how each of our themes are related to the SDGs, thereby raising our awareness.

The task force activities for business creation launched in fiscal 2015 have been proving effective, helping to raise the percentage of successful R&D themes. In the task

force activities, the planning division takes the initiative in formulating a scenario to “win” in the next 10 years and beyond, not only focusing on interesting technologies but in view of social trends and paying attention to the SDGs, in which young researchers also participate.

**Iriguchi:** Toward 2030, our mission is to develop and produce “amazing materials” that can contribute to realizing amenity for people and society. To this end, we will no longer adhere to the approach we have taken up to now but introduce DX and other new technologies to improve our production technology capabilities, while proactively promoting collaboration with the research side on themes showing potential, with the aim of achieving early commercialization.

**Kanaida:** Among the products that are currently under development, such as semiconductor materials and methylene malonate, some are associated with themes for which we can create unprecedented solutions while accumulating unrivaled production know-how. In the fields of new energy and information, on the other hand, highly processed candidate products, which are rather devices than materials, have been emerging one after another. By taking advantage of Nippon Shokubai’s DNA and promoting collaborations between production and R&D in new fields, we will enhance our competitive advantage and accelerate the creation of new businesses and products.



# Value Creation in the Medium-term Business Plan

Toward achieving the goals in the second half of its Medium-term Business Plan, “Reborn Nippon Shokubai 2020 NEXT,” in fiscal 2020, the final year of the Plan, Nippon Shokubai is working on improving its corporate value through initiatives to strengthen the competitiveness of the SAP business and create new businesses and products, such as cosmetics and medical materials.

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### 27 Strengthen the Competitiveness of SAP business

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## Medium-term Business Plan and Progress of the Strategy

### Outline of the Plan

#### Business Policies

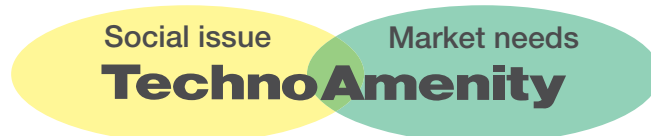
- Focusing on profitability over sales
- Safe, reliable production activities

#### Priority Challenges

- Survival of SAP business
- Launch of new businesses in high-growth potential markets as our future key driver

#### Basic Posture

Create products and services which market needs, and provide the products and the services when market needs.



#### Numerical targets for 2020 (IFRS)\*

##### Sales revenue

**400 billion yen**

**Sales increase during the period: 106.0 billion yen**  
(Sales revenue: 294 billion yen in FY2016 → 400 billion yen in FY2020)

##### Profit before tax

**40 billion yen (profit margin on sales revenue: 10%)**

##### ROA

**7.4%**

\* Starting from fiscal year ended March 2019, Nippon Shokubai has voluntarily adopted the International Financial Reporting Standards (IFRS) for consolidated financial statements in the securities report. Accordingly the figures for numerical targets have been adjusted.

### Progress

#### Policies for Priority Challenges

##### Strengthen the competitiveness of SAP business

→P.27

- Under the SAP Survival Project, reduced costs throughout the entire supply chain.
- July 2018: New SAP plant in Belgium entered commercial operation.
- November 2021: New acrylic acid production facility is planned to be established in Indonesia.

##### Accelerate the creation of new businesses and products →P.30

- In the cosmetics area, we have internally developed over 10 chemical cosmetics materials, including multifunctional acrylic acid polymers and cross-linked non-ionic polymers. We have also been promoting the development of natural cosmetics materials such as botanical extracts in collaboration with GREENTECH France and Marine Nano-fiber Co., Ltd., and joint businesses with Nano Cube Japan Co., Ltd. and Lilac pharma Inc.
- In the medical materials area, with a view to starting contract manufacturing at the API synthesis production facility, we have been promoting the development of nucleic acid drugs in partnership with TAK-Circulator Corporation and Renatherapeutics Co., Ltd. We are also working on the development of peptide drugs through joint research with GlyTech, Inc.
- In the imaging area, besides working on the global launch of VEEA™, which is used as a reactive diluent for UV inkjet printing, and the expansion of applications of AOMA™, we have been developing the market for iOLED™ film light source, an ultra-thin organic EL device highly resistant to water and oxygen.
- In the energy conversion area, we have been promoting the development of rechargeable carbon-zinc hybrid batteries with reduced environmental impact and longer life, and separators for alkaline water electrolysis that will contribute to the development of green hydrogen.

#### Targeting Sustainable Growth →P.35

##### Develop an active corporate team and organization →P.36

- Work innovation activities have been carried out since fiscal 2017 in three working groups under the themes of business process re-engineering, workstyle reform, and IT solutions.

##### Strengthen our Group management →P.37

- To improve the corporate value of the Group as a whole, we have been working to maximize business synergy at each company and create synergies between organizations and human resources.

##### Enhance the confidence of stakeholders →P.38

- Based on the belief that promoting CSR activities is closely related to implementation of the Group Mission, we are promoting activities related to corporate governance, corporate ethics, responsible care (RC), risk management, human rights and labor, social contribution, and information disclosure.





### Leader's Message

## Making Group-wide efforts to enhance the SAP business

### Katsuyuki Wada

Deputy Director  
Superabsorbents Business Division

#### Establish a solid supply system for the SAP market and enhance technology development to increase competitiveness

In the superabsorbent polymers (SAP) market, demand has been steadily growing globally, mainly in emerging countries, and average annual growth of around 5% is expected in the future. In fiscal 2019, the market showed some weakness partly due to the expansion of plants by our competitors. In fiscal 2020, on the other hand, with no such moves seen in the market, I think the market environment is turning to a better direction.

Maintaining the largest share of the SAP market, Nippon Shokubai supplies SAPs mainly for manufacturers of disposable diapers around the world as materials for sanitary products. Foreseeing the growth potential of the market, the company built a new SAP plant in Belgium in fiscal 2018. With this, the total production capacity at our five production sites reached 710,000 tons per year, and thus a system has been established to supply products that satisfy the needs of each region in a safe and timely manner.

In recent years, on the other hand, due to the intensifying competition among disposable diaper manufacturers and the rise of emerging SAP manufacturers, prices have been declining, associated with a gradual decrease in profitability. The needs of disposable diaper manufacturers are also diversifying in each region. We are continuously promoting technology development to satisfy such needs while reducing costs.

#### A top-down approach for sharing the current sense of crisis encourages sites around the world to voluntarily conduct improvement activities

The Company is working on the SAP Survival Project launched in the second half of its medium-term business plan, "Reborn Nippon Shokubai 2020 NEXT," to enhance the competitiveness of the SAP business. This project

is aimed at improving the profitability of the business by reducing costs throughout the entire supply chain. The activities are promoted for the entire Group, including operation sites both in Japan and overseas. Personnel at our sites around the world are proactively involved in improvement activities and strongly promoting the project while maintaining communication within the Group.

The word "survival" in the project name has had a strong impact on our employees. The top-down sharing of the sense of crisis raised the motivation of employees, encouraging them to propose various themes (solutions). Themes include both those requiring short-term examination in order to achieve results and those associated with capital investment and requiring examination over the medium to long term. We are simultaneously working on both types. In fiscal 2019, we achieved around 30 to 40% of the profitability improvement target for fiscal 2025. In fiscal 2020, we will accelerate our efforts to raise this achievement rate to 50%.

#### In response to the diversifying SAP product needs, we will provide new value with foresight and technology development

Recently, needs for SAP products have been increasingly diversifying. In facing this trend, I believe that it is important to identify the real needs that disposable diaper manufacturers (sanitary materials) and the end consumers potentially have and conduct technology development.

For example, there are several types of environment-friendly products, such as those using raw materials derived from non-fossil fuels and those that are biodegradable. I think it will be important to identify which types of products will be demanded in the market by thoroughly examining their functions and applications.

We will make Group-wide efforts to be able to deliver high value-added products at appropriate prices and in a timely manner, and continue to enhance our competitiveness.

Functional  
ChemicalsUnique product  
lineups

## Consumer products and construction materials

## Competitive advantage of the superabsorbent polymers (SAP) business

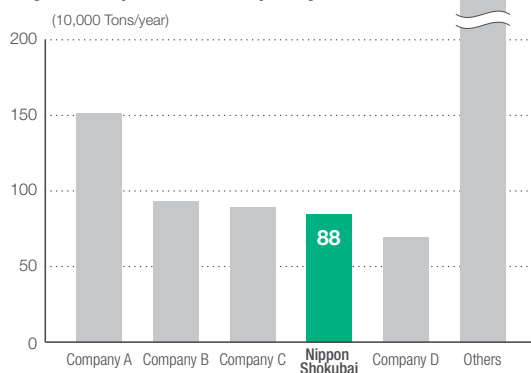
Nippon Shokubai is one of the leading chemical producers in the world in terms of the production volume of superabsorbent polymers (SAP) and acrylic acid, their raw material. In 1970, Nippon Shokubai succeeded in the industrialization of acrylic acid by direct oxidation of propylene for the first time in the world. Our acrylic acid production technology, which enables low-cost, large-scale production, has been broadly introduced by major manufacturers around the world.

Nippon Shokubai developed and began large-scale production of SAPs, which are used as materials for disposable diapers, ahead of other chemical manufacturers in the world, which has led to our long-term dominance of the global market. We have taken advantage of our

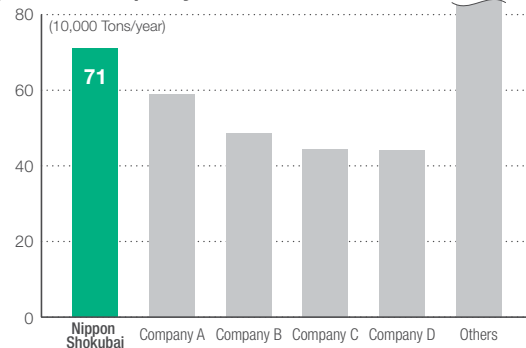
strengths—including the product development capabilities to create various new products, innovation in manufacturing processes, integrated production from acrylic acid as a raw material, supply systems covering the world, and intellectual property strategies to effectively protect our technologies—to end up with the largest market share in the world.

To further enhance the competitive advantage, we will work to develop new catalysts for producing acrylic acids with higher yield and longer life, acquire halal certification for acrylic acids, acrylates and SAPs produced at our site in Indonesia, and develop environment-friendly SAPs and other products that can respond to the needs of the market and requests from society.

## Acrylic acid production capacity



## Superabsorbent polymers (SAP) production capacity

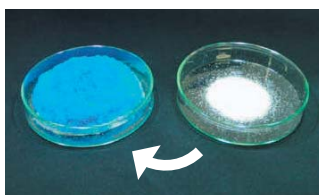


Source: Survey by Nippon Shokubai

## Close Up

## What is a superabsorbent polymer (SAP)?

Disposable diapers, which absorb the urine of babies, are indispensable in child-raising today. Superabsorbent polymers (SAP) are resin with an excellent ability to absorb and retain water. Just 1 g of the resin can absorb 100 to 1,000 g of water. Various ideas to make babies more comfortable are reflected in the resin, such as making diapers thinner and smaller.



Can absorb approximately 100 to 1,000 times the quantity of water



### Enhancing acrylic acid and SAP production capacity

The global launch of our acrylic acid and SAP business began with the setting up of a production site in Tennessee, U.S. in 1988. Today, we have achieved a stable supply on a global scale through production sites in Japan, the U.S., Indonesia, Belgium, China and Singapore.

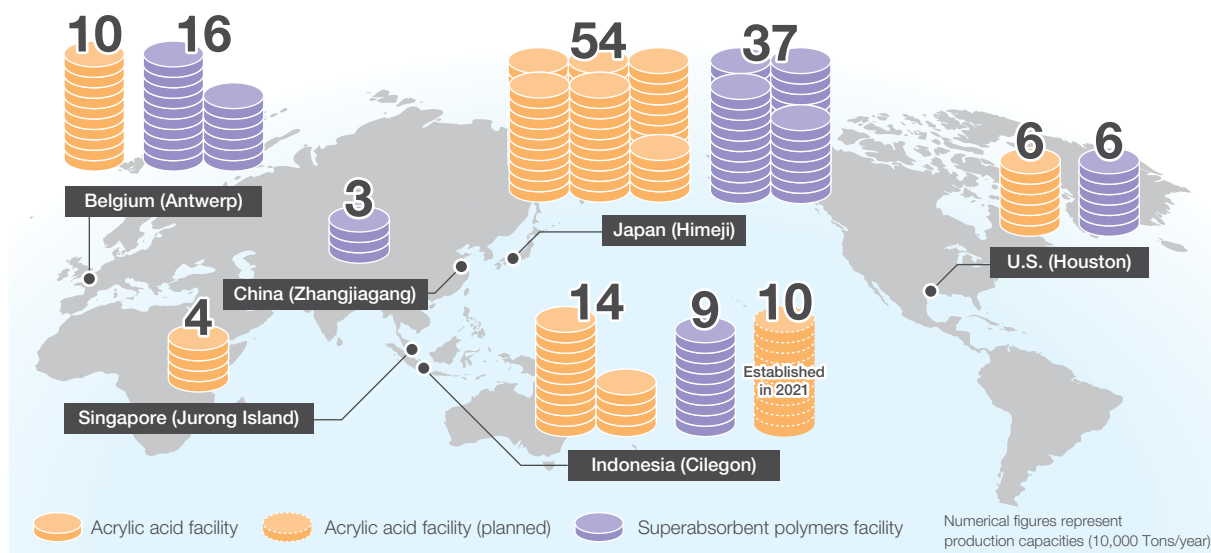
Global demand for SAP is approximately 3 million tons (estimate for 2019) at present. In the medium run, we assume an annual increase of 5%. In Europe, a steady increase is expected, mainly in Central and Eastern Europe. To respond properly to the demand in the area, we enhanced our SAP production facilities in Belgium in July 2018. Next to this, we also set up a new production facility for acrylic acid. This enabled integrated production from raw materials in Europe, and strengthens the system for stable global supplies of SAP. As a result, our Group's production capacities of acrylic acid and SAP increased to 880,000 tons and 710,000 tons, respectively. We will leverage these capacities to further enhance our competitive advantage.

In order to properly respond to the increasing demand for acrylic acid in Asia, we plan to invest approximately 22

billion yen in November 2021 and build a new acrylic acid production facility with a production capacity of 100,000 tons in Indonesia. We will continue to improve the quality and stable supply of products, thereby further enhancing our competitive advantage.



SAP plant in Belgium



### Cost reduction through improving production efficiency

Besides strengthening our production system, we are promoting the SAP Survival Project as a measure to improve profitability through cost reductions. Under this project, we are steadily advancing cost reductions not only by improving production efficiency but also by accumulating improvements in all stages of the supply chain, from the procurement of raw materials to manufacturing and

transportation.

We are also implementing a plan to introduce AI and IoT to the Himeji Plant to improve its production efficiency, and will gradually introduce AI and IoT to other plants both inside and outside Japan, thereby enhancing our competitiveness.

## Accelerate the Creation of New Businesses and Products

### Leader's Message

## Contributing to the realization of sustainability through new businesses

### Yasutaka Sumida

Executive Officer

Director, Innovation & Business Development Division



### Advancing to the development stage for the commercial launch of businesses in medical materials, cosmetics and energy conversion

As a priority task for the second half of its Medium-term Business Plan “Reborn Nippon Shokubai 2020 NEXT,” Nippon Shokubai is working on accelerating creation of new businesses and products. To create new value in three sectors covering eight areas that we have determined after evaluating market potential, suitability for the company, and social needs of the businesses, the Company has invested a total of 57 billion yen over four years up to fiscal 2020 to promote the reshuffling of organizations mainly in the R&D segment, and market-oriented R&D activities in collaboration with external parties.

In fiscal 2020, the final year of the Plan, in the areas of medical materials and cosmetics in the life sciences sector and the area of energy conversion in the energy & environment sector, several products with the potential to become core products in the future have been developed prior to other products and are advancing to the full-scale development stage. At the same time, responsibility for development has been transferred from the Innovation & Business Development Division to relevant business departments to accelerate the initiatives. Achieving the market entry of core products (with sales of around 1 billion yen) by FY2020 is a goal for the second half of the Medium-term Business Plan. Although we are behind schedule, several items have been steadily growing in each target sector, for which we can estimate the scale of sales at the time of market entry.

### Toward achieving sustainability, create new businesses with greater emphasis on social needs

Four years have passed since the beginning of the second half of the Medium-term Business Plan, and the circumstances surrounding new businesses have changed significantly. In particular, it has been increasingly important to have a perspective based on social needs, such as thinking about

how we can contribute to social issues on a global scale, such as the SDGs (sustainable development goals).

I think that this will be an important evaluation criterion in re-examining sectors to focus on for the formulation of the next medium-term business plan scheduled in fiscal 2021 or later.

We have already contributed to sustainability through various products and businesses. However, to advance research and development more efficiently from a medium- to long-term perspective, we set up a project team to integrate plans and studies concerning sustainability, which had been distributed in multiple locations, in April 2020. Under mission goals such as achieving a decarbonized society, the team will clarify themes and targets to be focused on in the future and tirelessly advance R&D activities, which will be expanded into company-wide initiatives. We are planning to concentrate resources into such initiatives as necessary.

### Promote open innovation to satisfy market needs

There is a limit to what a single company can do to solve social issues that have a significant impact on society. Since the value of a seed (for business) is determined by the market, not by researchers, it is important to have it objectively evaluated by customers or through open innovation with external parties, so that we can see which seeds fit which needs.

Such evaluation, however, is very difficult and requires the ability of judgment. Our participation in the Universal Materials Incubator (UMI) is part of our initiatives to enhance such judgment. Researchers dispatched to UMI can not only learn various knowledge and skills but also hone their ability of judgment and use this ability for the good of the Company. This will lead to the development of new technologies and inspire other researchers.

Moreover, to make effective use of data and information throughout the Company, we set up the Data Science & Informatics Promotion Office in June 2020, and we will also work on the creation of new businesses more efficiently.



Functional  
Chemicals

Unique product  
lineups

Life sciences

## Cosmetics area

Contribution  
to SDGs



### Why this area?

While products with higher quality and better performance are required in the Japanese cosmetics market, the overseas cosmetics market is expected to grow along with the increase in population and rise in income levels in Asian countries. The market is expected to grow to approximately 47 trillion yen (forecast for 2022). Nippon Shokubai is engaged in the development of highly functional and appealing materials, which are compatible with its technologies for synthesis and polymerization, particle synthesis technology, and catalyst technology, which are the technological strengths of the company.

### Initiatives

## Offer a proposal-based cosmetics business capable of presenting a story

### Internally developed chemical materials and natural materials developed through joint research

We have developed over 10 chemical cosmetics materials, including acrylic acid polymers with multiple functions that satisfy different needs, and cross-linked non-ionic polymers (thickeners). We will continue to expand the lineup through modifying existing products for cosmetics.

Meanwhile, for cosmetics using natural materials that we do not possess, such as botanical extracts, we are advancing the development of such materials through external partnerships. In collaboration with GREENTECH S.A. (France), a company that has the technology to extract active components from plants, we promote sales of their products in Japan and applied development in collaboration with them. (For more details, please refer to the table below.) In the future, we will conduct joint R&D on new materials using plants growing in Asia. With Marine Nano-fiber Co., Ltd., we promote collaboration on chitin nanofibers using crab shells.

### Basic strategy

Focusing on skin care and peripheral areas as the core target, we develop cosmetics materials with multiple functions, using our proprietary catalyst and organic synthesis technologies. In addition, by acquiring natural materials and new techniques that we do not possess through external partnerships, we aim to develop a proposal-based cosmetics business capable of presenting a story for customers and achieve sales of one billion yen in fiscal 2020.

### Aiming to integrate chemical and natural materials

We are also working on the development of products and technologies by integrating both chemical and natural materials. Examples include joint development of new materials based on nanodispersion technology using Nano Cube Japan's micro reactor, establishment of industrial production processes for Liposome (phospholipid bilayer membrane) using iLiNP™, a microflow device owned by Lilac pharma Inc., and development of new products with active components capsuled in Liposome.

### Major materials for cosmetics

	Material name / Product name	Efficacy	Material classification
Chemical	Multifunctional polymer	Antibacterial, antifungal, moisture-retaining, film-forming	Hydrophilic cation polymer
	Moisture-retaining polymer	Moisture-retaining capacity and good texture	Non cross-linked non-ionic polymer
	Rheology modifier	Absorption/release and thickening of various solvents such as water, oil, active ingredients	Cross-linked non-ionic polymer based on N-Vinyl pyrrolidone
	HIDS™	The effect as preservative booster	Biodegradable chelator
Natural materials	● EXPOZEN™	Anti-aging such as crow's feet, mitigate inflammation and itchiness, improve skin barriers	Hydrolyzed red algae extracts produced from red algae growing in deep seas such as the Indian Ocean
	● HAIRILINE™	Prevent hair loss and stimulate hair growth by improving the blood circulation of scalp	Extracts from linden roots growing in Southeast Asia
	● HEBELYS™	Prevent early aging and improve the dermis structure	Polysaccharide obtained by culturing Sphingomonas, a bacteria capable of living under severe environments
	● Marine nanofiber	Cell activation, stimulate collagen production and anti-bacterial effect	Chitin nanofibers obtained from crab shells

● GREENTECH France ● Marine Nano-fiber Co., Ltd.

## Value Health and beauty

### Relieving skin problems due to aging and UV rays

Demand for skin care cosmetics for whitening, moisture retention, anti-aging, and sun care have been growing worldwide among those who are worried about dry skin, spots, dullness, wrinkles, etc. due to aging and UV. We will propose solutions to respond to these needs and exploit new markets utilizing our polymer technologies.



## Medical materials area / Pharmaceutical

### Why this area?

Middle-molecule drugs, such as oligonucleotides and peptides, with expected high growth potential, have high specificity at about the same level as biopharmaceuticals such as proteins and antibodies. Active R&D activities for these drugs have been conducted as next-generation drugs for diverse diseases. Middle-molecule drugs, which require advanced synthesis and analysis technologies, are familiar to the Company, with our abundant experience in the production of chemicals. Nippon Shokubai is therefore proactively working on this area as a new business.

### Initiatives

## Conduct joint research for drug discovery and contract manufacturing of middle-molecule drugs

### Established a new API synthesis production facility, one of the largest in Japan

In January 2019, one of the largest API manufacturing facilities equipped with a synthesizer for oligonucleotide and peptide drugs, large-scale separation and purification apparatus, a freeze dryer and other production equipment, and analysis equipment for QC testing was completed. Using this facility, which is compliant with GMPs<sup>\*1</sup> in Japan, the US and the EU, and the PIC/S Guide,<sup>\*2</sup> we will respond to the needs for contract synthesis of APIs ranging from Lab scale (mg-g) to commercial production (some 100 g) scale.

\*1: Good Manufacturing Practices, referring to the standards for production management and quality management of pharmaceuticals.

\*2: Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme, referring to an international framework to promote the establishment of GMP and mutual inspections.



API synthesis production facility

## Value Health and beauty

### Contribute to the treatment of patients suffering from intractable diseases

Middle-molecule drugs are expected to serve as innovative drugs for intractable diseases such as cancers and inherited disorders. With a view to providing patients suffering from such diseases with new medical treatment as soon as possible, We will establish and develop a middle-molecule drug discovery business.

### Basic strategy

Through collaboration with drug discovery ventures having promising seeds in this field, we will contribute to the development of middle-molecule drugs, such as oligonucleotide drugs and peptide drugs. Since there are very few facilities available for mass production of APIs in Japan, we will build a new mass production facility dedicated to the production of APIs, and offer total contract manufacturing services from drug discovery and clinical development to commercial production. The target sales for medical materials businesses in fiscal 2025 is over 10 billion yen.

### Promote commercialization of oligonucleotide drugs

For oligonucleotide drugs, Nippon Shokubai is engaged in joint businesses with TAK-Circulator Corporation, with which we have a capital relationship, and with Rena Therapeutics Inc., which became our subsidiary in 2019.

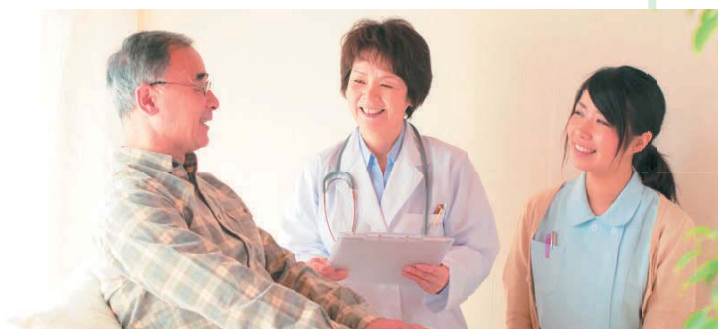
With TAK-Circulator Corporation, we have been working on joint commercialization of oligonucleotide drugs for steroid-resistant refractory severe asthma. This is the first ever drug for neutrophilic severe asthma, and we are aiming to start contract manufacturing of its API in fiscal 2020.

With Rena Therapeutics Inc., we have been advancing development of platform technologies for novel oligonucleotide drugs by employing heteroduplex oligonucleotide (HDO) technology as the fundamental technology for drug discovery. We are supporting the development of synthesis technology for early commercialization.

### Joint development of peptide drugs

For peptide drugs, in collaboration with GlyTech, Inc., which possesses glycosylation technologies mainly for human-type sugar chains, we are advancing clinical development of glycosylated somatostatin analog (G-SRIF).

Having completed nonclinical studies and early exploratory clinical trials, the drug is currently undergoing Phase I clinical trials. In addition, out-licensing activities to pharmaceutical companies are in progress.



Functional  
Chemicals

Unique product  
lineups

ICT  
.....

## Imaging area

Contribution  
to SDGs



### Why this area?

Among photosensitive materials, UV inkjet inks and resins for 3D printers are expected to grow by 6.5% and 8.4% annually, respectively, in the global market (survey by Fuji Keizai Co., Ltd.). As the shift to UV is accelerating in response to the need for low-VOC inks and paints due to tightening regulations, 3D printing is growing rapidly because it is capable of responding to needs for the production of a wide variety of products in small quantities within a short delivery period. For these applications, the performance of resins has been constantly improved, and Nippon Shokubai is working on developing materials that improve toughness, heat resistance and adhesion, monomers with low viscosity and polymer products based on its unique proprietary technologies.

### Initiatives

## Develop materials that will support a convenient and comfortable society

### VEEA™ and AOMA™, reactive diluents for UV inkjet printing

VEEA™ is an acrylate monomer featuring excellent UV-curable performance and low viscosity and used as a reactive diluent for UV inkjet printing. It is particularly suitable for printing labels such as QR codes, and demand is expanding mainly in Europe and the U.S., where UV printing is prevailing due to tighter environmental regulations.

On the other hand, AOMA™ is also excellent as a diluent for UV/EB curable material because of its very low viscosity. And its polymers have both hardness/heat resistance and flexibility/toughness. These characteristics were generally thought to be difficult to coexist. AOMA™ adds toughness and heat-resistance to formed objects produced by UV-curable 3D printers.

In the future, various expanded applications can be expected, such as coating materials for flexible devices and adhesives for dissimilar materials bonding.



3D printer

### Basic strategy

Nippon Shokubai is proactively promoting R&D and commercialization of functional monomers as the key material. Nippon Shokubai possesses about 10 key monomers, including 2-(2-vinyloxyethoxy) ethyl acrylate (VEEA™) and AOMA™, which are produced only by Nippon Shokubai. We have also developed unique polymer products using these monomers. We have doubled the VEEA™ production capacity of Himeji Plant to respond to the rapid increase in demand.

Also as a new attempt, we are aiming to explore new markets with ultra-thin film light sources using our unique organic LED (Light-Emitting Diode) technology.

### Close Up

### ioLED™ film light source, ultra-thin organic LED device resistant to water and oxygen

ioLED™ film light source is an organic EL film light source based on the technologies Nippon Shokubai has jointly developed with Japan Broadcasting Corporation (NHK) Science & Technology Research Laboratories. It even has stability in the air with water and oxygen, which is thought to be the intrinsic issue of conventional organic LED; a thickness of 0.07 mm, which is thinner than paper; and excellent flexibility. We succeeded in the development by inverting the device structure to use metal that do not easily oxidize for the electrodes while using new material that can easily carry electrons for part of the organic layers between electrodes.

Moreover, we also developed a new, dipole-type electron injection technique using organic base materials, achieving fine control of emissive colors, long life, and ultra-thin film devices. This technique is expected to help improve the performance of ioLED™ film light source and simplify processes to reduce costs.

Currently, application to interior/exterior coating of displays and automobiles, apparel decorations and medical devices is being considered. Furthermore, collaboration with Wajima Kirimoto, a manufacturer of "raden" items, a Japanese traditional craft technique, resulted in the production of "Yoko" Wajima Lacquer work. We thus work to provide new value.



ioLED™ film light source



Emissive Wajima Lacquer work "Yoko"

## Value Comfortable lifestyle

### Contribute to a comfortable society through realizing a convenient printing environment

Digital on-demand printing has been gaining popularity mainly in Europe and the U.S. The market has also been expanding in Japan because of advantages such as the capability to respond to demand for high-mix low-volume printing and reduced printing plate processes to improve efficiency. VEEA™ and AOMA™ contribute to a comfortable society through realizing a speedy and convenient printing environment.

Also, with the ultra-thin film light source, we offer an unprecedented light experience.



## Environment & Catalysts

### Unique catalyst technology

## Energy and resources

# Energy conversion area

Contribution  
to SDGs

## Why this area?

After the Paris Agreement, use of renewable energy has been increasingly promoted to help reduce CO<sub>2</sub> emissions, and for the storage and use of such energies, new materials are required in the production of storage batteries and green hydrogen. Dramatic growth from the mid-2020s is expected, for alternative batteries that will replace existing storage batteries by realizing improvements in price, safety, and performance in terms of energy storage, and for utilization of the water electrolysis technique in terms of green hydrogen production. Nippon Shokubai will contribute to energy conversion through developing various separators by employing the organic and inorganic synthesis technology and sheet forming technology it has cultivated.

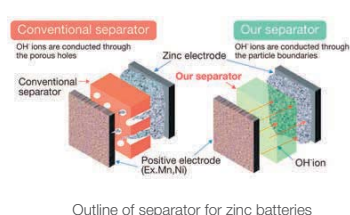
## Initiatives

# Contribute to the spread and promotion of next-generation energies, such as new storage batteries and hydrogen

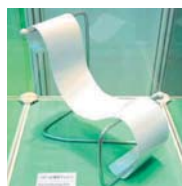
## Developing rechargeable carbon-zinc hybrid batteries with longer service life

Rechargeable carbon-zinc hybrid batteries are a totally new type of rechargeable zinc battery developed by combining the separator for zinc batteries and the zinc negative electrode, which were developed using our unique technologies, with activated charcoal. They can be produced using water, charcoal, and zinc as the main ingredients, which are abundant resources and non-toxic. Since they are water-based, there is no risk of burning.

They also have excellent output and low-temperature performance, and are rechargeable for over 10,000 cycles, realizing very long life. Compared to conventional lead batteries, which die after some hundred cycles, the new batteries can be used repeatedly for 10 times longer. They are expected to be used for vehicle batteries, which currently use lead batteries, and for storage of natural energy-derived electricity. A joint study with Suwa University of Science is under way on the smart agriculture technologies that will enable both generation and storage of power at agricultural houses.



Outline of separator for zinc batteries



Separator for zinc batteries

## Basic strategy

In the field of storage batteries, in view of the forecast that the market for electric vehicles (EVs), electricity storage, and power will rapidly expand, we are working on the optimization of our separators for zinc batteries to be used in such fields in collaboration with battery manufacturers. In the field of green hydrogen, we have developed separators that improve efficiency in hydrogen production based on the assumption that this field will grow into a huge market, mainly in Europe, the region leading the world in the reduction of CO<sub>2</sub> emissions.

## Separator for alkaline water electrolysis

The separator for alkaline water electrolysis is used for alkaline water electrolysis<sup>2</sup>, a technique attracting attention as the production method for green hydrogen<sup>1</sup>. Hydrogen energy does not emit CO<sub>2</sub> when used and therefore its applications have been expanding as fuel cells for automobiles and houses.

The material of the separator has a significant impact on hydrogen production efficiency and therefore is required to have two characteristics: Not penetrating the generated hydrogen and oxygen (high gas barrier performance) and low film resistance (high ion conductivity). Under the severe conditions of high-temperature, high-concentration alkalic water, the number of both practical and durable separators is limited. However, Nippon Shokubai has succeeded in the development of a product that ensures both of these characteristics by applying our unique organic/inorganic hybrid technology and sheet forming technology.

This separator is expected to show several advantages, including reduction of power consumption and improvement of the purity of the hydrogen produced, thereby contributing to the spread of green hydrogen and a reduction in CO<sub>2</sub> emissions.

\*1: Hydrogen produced using renewable energy with reduced CO<sub>2</sub> emissions

\*2: Method of water electrolysis using strong alkali solution, such as potassium hydroxide

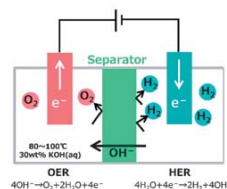


Image of alkaline water electrolysis



Separator for alkaline water electrolysis

## Value Climate change mitigation

## Contribute to the spread of new storage batteries and next-generation energies

By providing separators for zinc batteries applicable to a broad range of uses as inexpensive and safe new-type storage batteries, and separators for alkaline water electrolysis used as the main materials in the production of green hydrogen, we reduce CO<sub>2</sub> emissions and contribute to the mitigation of climate change.





# Targeting Sustainable Growth

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Nippon Shokubai's businesses are managed in a way that is friendly to the environment and society to earn the confidence of stakeholders, thereby ensuring sustainable growth and enhancing its corporate value in the medium to long term.

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36 Workstyle innovation activities

## **37 Strengthen our Group Management**

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## Develop and Active Corporate Team and Organization

# Workstyle innovation activities

We are building a foundation for our employees to be able to tackle changes and play active roles through not only workstyle reform but also by reviewing business processes and promoting the use of IT, so as to achieve sustainable growth for the company.

### Initiatives to develop an active corporate team and organization

To ensure sustainable growth for our company, it is crucial that our employees are playing active roles at work and tackling change. To ensure that this is firmly established, "Reborn Nippon Shokubai 2020 NEXT," the second half of our medium-term business plan, sets out "Develop an active corporate team and organization" as one of its major targets.

Recently, the Japanese Government and industry as a whole have been promoting workstyle reform. At Nippon Shokubai, we are introducing an initiative to develop an active corporate team and organization, which we have named "workstyle innovation activities." The workstyle innovation activities include not only workstyle reform but also reviewing company-wide work processes that may affect the workstyle of employees and making use of IT.

In fiscal 2017, to promote company-wide workstyle reform, the Workstyle Innovation Committee (headed by the President) and three working groups (specifically, the Business Process Re-engineering Team, Workstyle Reforming Team, and IT Solution Team) were formed. With these organizations, we continuously examine and carry out various specific measures based on the strategies of "start with anything you can" and "change once/try once."

### Activities by three working groups

#### Business Process Re-engineering Team

This team is developing various business process reforms with a view to completing a shift to business processes that are consistent with the current and/or future purposes, regardless of what happened in the past. The time saved through BPR (Business Process Re-engineering) across the company will be allocated to activities to improve the value provided to our customers. We promote visualization of internal information and granting of authority to front-line staff, with the aim of responding more promptly to customers.



#### Workstyle Reforming Team

This team is developing a system in which all employees are able to work efficiently with high motivation. As employees' ways of thinking about their lifestyle and the surrounding environment are increasingly diversifying, the team is considering measures to support diverse workstyles, including promoting women's active participation, so that employees can have a higher motivation for work. By introducing the flextime system for all employees except shift-work employees and other systems to allow flexible workstyles, the team promotes the work-life balance of employees.



#### IT Solution Team

To improve work efficiency and build a foundation for workstyle reform, the team is working on renewing the IT infrastructure, including groupware and the enterprise resources planning system (ERP), and the company-wide introduction of various IT tools that are rapidly advancing worldwide. Specifically, the team has introduced tools for paperless meetings and internal wireless LAN to enhance IT infrastructure, with the aim of improving productivity and work efficiency.



Workstyle innovation activities logo

#### Business Process Re-engineering Team

Developing measures to reduce workload from a company-wide perspective

#### Workstyle Reforming Team

Developing systems to make each individual's way of working efficient

#### IT Solution Team

Developing measures to make more effective use of IT

Outline of workstyle innovation activities

### Incorporating opinions of employees in implementing activities

To encourage employees' involvement in the activities, the Workstyle Innovation Committee holds opinion-exchange meetings with employees as a forum for interactive dialogue. These meetings enable the President and other Committee members (Director class) to listen directly to the opinions of employees, which helps them formulate effective measures. Active involvement of employees also helps accelerate the implementation of activities.



Opinion-exchange meeting

## Improving corporate value for the entire Group

Deeper ties are being made between our Group companies to make better use of the various management resources that each company has accumulated over time.

### Initiatives to enhance synergies

#### Maximizing business synergy

Greater changes are expected in the environment for business and management surrounding the Nippon Shokubai Group. Each company should make voluntary efforts to reduce costs, transform their products into high value-added products, and improve their unique technology development capabilities, thereby reinforcing their own business foundation. However, we cannot survive the upcoming severe circumstances by relying solely on each company's own competitive advantages. Group-wide efforts are being made to improve our corporate value. While applying selection and concentration to businesses and products, including withdrawal from certain businesses or products, we collaborate with and support our Group companies so that the management resources that each company has accumulated over time can be fully utilized within the Group.

Overseas, in response to rising specific needs of each region for our products and requests for prompt supplies, Nippon Shokubai has set up plants in the United States, Indonesia, Singapore, Belgium, China, and Taiwan, and thus established a production and supply network covering the US, Asia and Europe. We will continue reinforcing our overseas production network so that the effect of synergies with overseas companies can be further enhanced, in view of future demand trends.

Our Group companies in Japan are doing business in diverse fields, including general chemicals, processing, transportation, and trading. Ties among experts in different fields are creating strong synergies within the Group. Some of the Group companies have unique product portfolio and particular production technologies. Production facilities of these companies are made available to share within the Group. Other actions, such as promoting use of Group companies as production contractors (sample cases in fiscal year 2019: operation start of a pilot facility at Nisshoku Techno Fine Chemical Co., Ltd., and installing our experimental facility to Chugoku Kako Co., Ltd.) and sharing R&D information, are used to maximize business synergies.



Pilot facility to promote commercialization established in NISSHOKU TECHNO FINE CHEMICAL CO., LTD.

#### Creating synergies in organizations/ human resources

To reinforce our management foundation by increasing profits from existing businesses and launching new businesses, each of our Group companies must develop its own human resources to implement these initiatives and create organizations that are capable of flexibly adapting to changes in the management or business environment. We support initiatives by Group companies to revitalize their organizations and develop human resources.

We encourage sharing of know-how and knowledge among the production, intellectual property, and administration segments through training sessions or other opportunities, and encourage human resources exchanges within the Group (sample cases in fiscal year 2019, three employees were dispatched from Group companies in Japan to Nippon Shokubai), thereby enhancing Group synergy. We actively support Responsible Care (RC) activities conducted by Group companies in Japan and overseas. Specifically, we periodically organize meetings for discussions, hearings, and information exchange, and conduct necessary audits on RC, namely, environment & safety, and quality.



Global HR meeting

#### Developing frameworks and systems for business expansion overseas

Nippon Shokubai has proactively expanded its businesses overseas, mainly its businesses in acrylic acid and superabsorbent polymers (SAP). Building/increasing facilities at existing production sites and setting up new sites are anticipated. We are working on developing frameworks and systems for more business expansion overseas in the future.

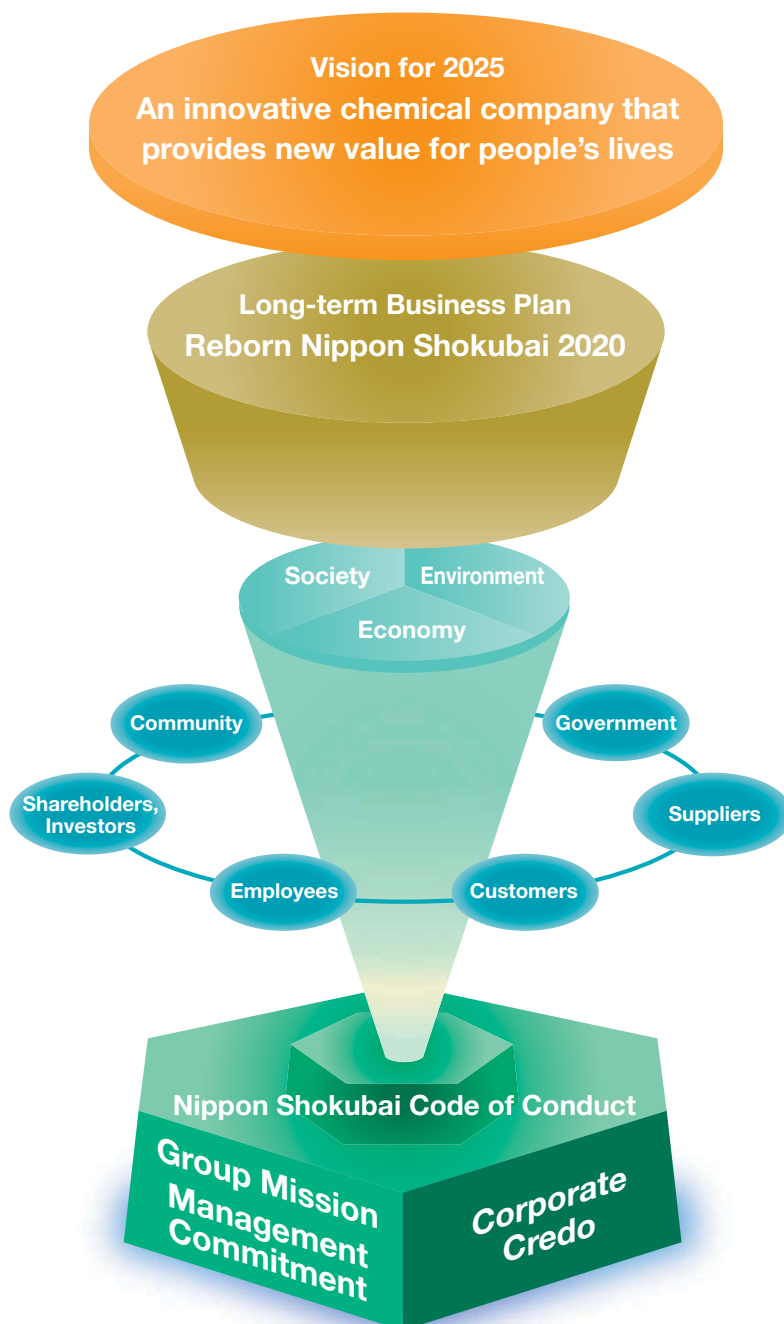
Corporate and business policies are well shared by the entire Group through meetings of the presidents of overseas Group companies and visits to Group companies by our executive officers.

## Enhance the Confidence of Stakeholders

### CSR Concept

We conduct business activities with the determination to contribute to society, under the Group Mission “**TechnoAmenity** - Providing affluence and comfort to people and society, with our unique technology.” Based on the belief that promoting CSR activities is implementing Group Mission, we take a comprehensive view of our corporate behavior that encompasses the economy, society and the environment. We therefore prioritize corporate governance, corporate ethics, Responsible Care, risk management, human rights and labor, social contribution, and information disclosure. In implementing actions to increase our corporate value, we emphasize dialogue with our customers, business partners, employees, the communities we serve, public administrators, shareholders and investors and all other stakeholders.

Our CSR concept is the foundation underpinning our Vision for 2025. We intend to realize this vision by implementing “Reborn Nippon Shokubai 2020”, our long-term business plan, and contributing to the emergence of a sustainable society.





# CSR Medium-term Targets and Initiatives, and Results for Fiscal 2019

To promote company-wide CSR activities, we have formulated CSR medium-term targets and initiatives spanning the same four years as the second half of the Medium-term Business Plan “Reborn Nippon Shokubai 2020 NEXT.”

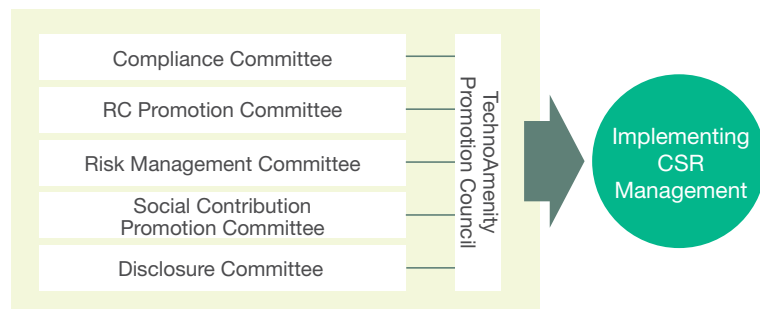
We implement PDCA for each fiscal year and release achievements and progress for the year.

## CSR Medium-term Targets and Initiatives, and Results for Fiscal 2019

Stakeholder	Subject		Medium-term Targets & Initiatives
Company-wide	Corporate Ethics		To continue to emphasize corporate ethics while strengthening our regulatory compliance structure and enhancing various training programs
	Risk Management		To endeavor to expand our risk management while regularly analyzing risk, including undertaking a review of our current Business Continuity Plan
	Corporate Governance		To further strengthen and enhance corporate governance, including improving the functioning of the Board Meeting, in order to enhance corporate value and achieve sustainable growth
	Information Security		To revise regulations covering information management in order to focus on the utilization of electronic data To establish an information security system to implement the above
<b>Environment</b>     	Environmental Protection	Preventing Global Warming	1) To reduce energy consumption by an amount equivalent to 8,000 kL of crude oil (over 4 years) 2) To reduce energy intensity by 5% from fiscal 2015 levels by fiscal 2020 3) To reduce CO <sub>2</sub> emissions intensity (by energy origin) by 5% from fiscal 2015 levels by fiscal 2020 4) To reduce fuel consumption intensity for road transport by 5% from fiscal 2015 levels by fiscal 2020 To promote modal shift
		Waste	To maintain zero emissions (Quantity of final off-site landfill) ≤ (Total amount of waste generated × 0.1%)
		PRTR	To reduce emissions of substances subject to the PRTR Law by 25% from fiscal 2015 levels by fiscal 2020
Customers	Quality		Promotion of company-wide quality initiatives 1) To improve customer satisfaction 2) To attain more trust from customers 3) To achieve “Zero serious quality complaints”
	Chemical Safety		To achieve zero problems related to chemical safety (legal or social problems)
<b>Suppliers</b>  	Logistics Safety		To achieve zero accidents during logistics transportation
	Procurement		To continue implementing green procurement To promote CSR procurement.
Shareholders & Investors	Information Disclosure		To continue to disclose information in accordance with our corporate governance code and to aim for more relevant responses in order to maintain high-quality constructive dialogue with shareholders and investors.
<b>Community</b> 	Social Contribution		To enhance the social contribution initiatives of the Nippon Shokubai Group as a whole To formulate and implement the Third-term Plan (fiscal 2018–fiscal 2022) addressing our forest development initiatives
	Process Safety and Disaster Prevention		To achieve zero severe process safety accidents
	RC Communication		To promote dialogue on Responsible Care initiatives with local residents and implement appropriate information disclosure
<b>Employees</b>   	Human Resources		To identify and train leaders who can lead the organization; to promote Diversity & Inclusion
	Occupational Safety		To achieve zero injuries with or without loss of workdays, including contractors
	Occupational Health		To provide all workers with a supportive and ideal work environment; to promote a healthy work-life balance
Government	Collaboration		To continue to cooperate with the administration through industrial associations and other avenues

## CSR Implementation Structure

We believe that promoting CSR activities and sustainability is implementing the Group Mission “**TechnoAmenity** – Providing affluence and comfort to people and society, with our unique technology.” To fulfill our corporate responsibilities, including solving social issues through business activities and thereby contributing to the development of a sustainable society, we are implementing our CSR activities under the CSR implementation structure.



### Achievements (Fiscal 2019 Results)

Implemented corporate ethics training for employees in managerial positions of our nine Group companies in Japan, in addition to managerial employees of the Company, and training on various individual laws and regulations (prevention of disguised contract labor, Subcontractors Act).

- Conducted periodic risk surveys and addressed individual risks as necessary.
- Conducted drills for information management and responding to the media in the event of an emergency.

- Evaluated the effectiveness of board meetings and enhanced provision of information to external board members based on the evaluation results.
- Verified the appropriateness of cross shareholdings at board meetings. And the exercise of voting rights was decided based on specific quantitative standards.

As measures to prevent incidents, we conducted training on information security regulations for new employees, training on responding to suspicious emails, and studying information protection measures upon retirement of employees.

- 1) Reduced energy consumption by 3,646 kL.
  - 2) Reduced energy intensity by 6.1% from fiscal 2015 levels.
  - 3) Reduced CO<sub>2</sub> intensity (by energy origin) by 12.2% from fiscal 2015 levels.
  - 4) Reduced fuel consumption intensity by 2.3% from fiscal 2015 levels.
- Continued to promote modal shift.

Continued to implement zero emissions policy.

Reduced emissions of substances subject to the PRTR Law by 27.2% from fiscal 2015 levels.

Promoted company-wide quality activities through the priority initiatives of the 10th Medium-term RC Basic Plan (Quality), implemented 1) to improve customer satisfaction and 2) to attain more trust from customers, but 3) received one serious quality complaint.

Registered zero legal or social problems related to chemical safety.

Registered zero accidents during product transportation.

- Conducted surveys on green procurement using a tool (chemSHERPA).
- Formulated the Procurement Fundamental Policy to promote continuous CSR procurement.

- Continuously disclosed financial results and other materials.
- Conducted IR meetings for analysts and institutional investors in May and November.

Continued to implement forest development initiatives in Japan, China and Indonesia according to the Third-term Five-year Plan.

Registered zero severe process safety accidents.

Published the RC Report.

- Deployed training for line managers, which had been implemented up to fiscal 2018 at the Kawasaki Plant, to the Suita Research Center and the Himeji Plant to strengthen the development of leadership personnel. Also, launched training for employees being promoted to managerial positions, and continued training for manufacturing managers.
- Launched a project with five female managers gathered from around the Company to discuss the vision that the Company should have regarding women's participation, current issues, and solutions. The project submitted draft measures to be implemented in fiscal 2020 and beyond.

Target not reached: Registered three injuries with loss of workdays and 11 injuries without loss of workdays.

- Continued the planned reduction of overtime hours through regular meetings of the Labor-Management Committee.
- Organized the Working Reform Group under the Work Innovation Committee and continuously reviewed various policies to support employees' diverse work styles.

Participated in a plan to contribute to the emergence of a low-carbon society and reported the results.

## Responsible Care (RC) Activities

We actively promote RC initiatives in priority areas of environmental protection, process safety and disaster prevention, occupational safety and health, chemical safety, quality and communication with society.

### RC Initiatives

All companies in the chemical industry responsible for handling chemical substances voluntarily agree to protect the environment, safety and health in all processes ranging from the development of chemical substances to their manufacture, transportation, use, end consumption, disposal and recycling. By disclosing the results of these activities to the public, the companies hold dialogues and communicate with society. These efforts are known as Responsible Care (RC). The RC Global Charter was developed in 2006 and revised in 2014 by the International Council of Chemical Associations (ICCA), which promotes RC worldwide.

Nippon Shokubai has participated in the Japan Responsible Care Council (currently known as the Japan Chemical Industry Association's Responsible Care Committee) since it was established in 1995, and has been advancing various initiatives by introducing relevant systems, such as the environmental management system under ISO 14001, the quality management system under ISO 9001, and the occupational safety and health management system (OSHMS).

We are determined to continue contributing to society while fulfilling our corporate social responsibility through our group-wide commitment to RC activities.



President's signature on the RC Global Charter (Revised 2014 version)

### RC Policy

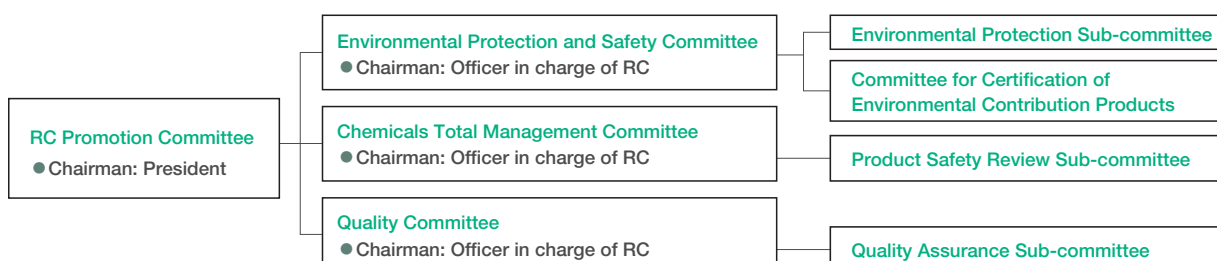
In conformity with the Nippon Shokubai Group Mission, Management Commitment, Corporate Credo, and the Nippon Shokubai Code of Conduct, we rank it as an important management measure to provide products and technologies that contribute to society and environmental protection. In addition, while paying due respect to the principle of Sustainable Development, we are determined to conduct all activities in accordance with the following policy related to environmental protection, safety, and product quality that will bring our business operations into harmony with the global environment.

We will implement this RC Policy in all our business operations by ensuring all employees have a thorough understanding and awareness of its importance. The president shall be the person with the ultimate responsibility for implementing this policy.

- 1** Aim at environmental protection and reduction of negative environmental impact throughout the entire life cycle of a product, from development to disposal.
- 2** Ensure the safety of our employees and our communities by targeting zero accidents and zero injuries with a commitment to the Corporate Credo, "Safety takes priority over production."
- 3** Confirm the safety of chemical materials, intermediates and products, and consider the health of our customers, employees of our logistics subcontractors, our employees, and others.
- 4** Stably supply products and associated services that meet customer satisfaction and inspire their trust.
- 5** Publicly announce the results of these activities and make an effort to communicate for proper understanding.

### RC Promotion Organization

The president is chairman of the RC Promotion Committee, and technical committees and sub-committees are established to promote company-wide RC activities.



# Environmental Protection Initiatives

We promote initiatives to reduce the environmental impact of our business operations, including tackling climate change and reducing waste through our supply chains.

## Environmental Protection through Our Products

### Promoting Environmental Contribution Products

Chemical products have an impact on the environment because they are produced using the Earth's resources and involve the discharge of CO<sub>2</sub> and other waste. However, looking at the entire product lifecycle from raw material extraction to product disposal, in some stages chemical products contribute to a reduction in the environmental load.

We evaluate how our products are used to reduce the environmental load through the supply chain to produce the various products in our daily lives and as equipment to produce our products and in the social infrastructure.

In fiscal 2019, Nippon Shokubai began to review its Environmental Contribution Products by reviewing internal criteria and establishing an internal certification system in which the certification committee examines the checklist items and numerical data and certifies the products.

#### Environmental Contribution Products

Types of contribution		Product life stage	Applications	Certified products
Global warming prevention Energy conservation	Greenhouse gas reduction	Manufacturing	Aquaculture feed binders	AQUALIC <sup>TM</sup> H (for feed)
			Concrete admixtures	AQUALOC <sup>TM</sup>
	Energy conservation	Use	Lithium-ion battery materials	IONEL <sup>TM</sup>
		Manufacturing	UV-curable reactive diluents	VEEA <sup>TM</sup>
		Use	Solid oxide fuel cell components	Electrolyte sheets for solid oxide fuel cells
Chemical emission reduction Air quality conservation	Chemical emission reduction	Use	Automotive damping materials	ACRYSET <sup>TM</sup> (for damping materials)
			Optical and electronic materials	ZIRCOSTAR <sup>TM</sup>
	Air pollution prevention	Use	Water-based paints	UWR <sup>TM</sup> , ACRYSET <sup>TM</sup> (for water-based paints)
			Water-based adhesives	EPOCROS <sup>TM</sup>
			Removal of HC (hydrocarbon), NO <sub>x</sub> , dioxin and other pollutants from exhaust gas	Automotive catalysts Waste gas treatment catalysts Denitrification catalysts and equipment Dioxin decomposition catalysts and equipment
Water resource conservation Water quality conservation Biodiversity conservation	Water contamination prevention	Use	Oxidation and decomposition of harmful substances in wastewater	Wastewater treatment catalysts for catalytic wet air oxidation
		Disposal	Water treatment additives	EPOMIN <sup>TM</sup>
	Biodegradability	Disposal	Detergent builders	AQUALIC <sup>TM</sup> L (for detergent)
			Detergent ingredients	SOFTANOL <sup>TM</sup> HIDS <sup>TM</sup>
Resources use reduction	Resources use reduction	Use	Hollow fiber membranes	Polyvinylpyrrolidone
Waste reduction	Waste reduction	Disposal	Concrete admixtures	AQUAGUARD <sup>TM</sup>

### Promoting CO<sub>2</sub> emissions reductions throughout the product lifecycle

We employ the c-LCA (carbon-Life Cycle Analysis) method to assess the degree to which our products contribute to reducing CO<sub>2</sub> emissions.

The c-LCA method assesses CO<sub>2</sub> emissions throughout the lifecycle of a final product incorporating a specific chemical product compared with a product that does not contain the chemical product. The difference in the volume of emissions is calculated as the net volume of emissions that would be avoided as a result of using that chemical product.

<b>AQUAGUARD<sup>TM</sup></b>	Calculation of CO <sub>2</sub> emissions avoided in one year when all apartments are built as long-lasting structures	3.4 million tons
<b>ACRYSET<sup>TM</sup></b> (for damping materials)	Calculation of CO <sub>2</sub> emissions avoided when an application-type vibration-damping material is installed in all automobiles manufactured in one year	310,000 tons
<b>ZIRCOSTAR<sup>TM</sup></b>	Calculation of CO <sub>2</sub> emissions avoided when ZIRCOSTAR <sup>TM</sup> is incorporated in all smartphones manufactured in one year	220,000 tons
<b>VEEA<sup>TM</sup></b>	Calculation of expected CO <sub>2</sub> emissions avoided from the use of all the UV curable inks produced in one year	330,000 tons
<b>AQUALIC<sup>TM</sup>H</b> (for feed)	Calculation of CO <sub>2</sub> emissions avoided when all aquaculture feed produced in one year is replaced with moist pellets	80,000 tons

For details, please refer to RC Report 2020.



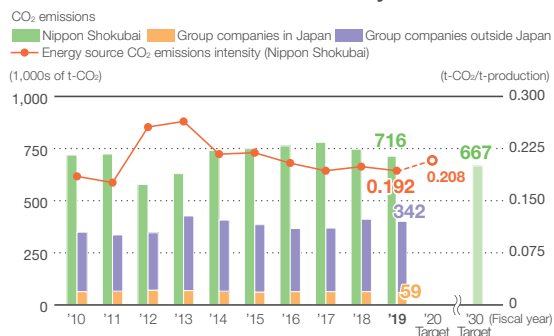
## Tackling Climate Change

### Promoting CO<sub>2</sub> emissions reductions

At Nippon Shokubai, in line with the targets set in the commitment to a low carbon society by the Japan Chemical Industry Association, the RC Promotion Committee, chaired by the President, has formulated the Medium-term RC Basic Plan. Based on this Plan, each plant implements activities to reduce energy consumption under the initiative of the energy management committee. Furthermore, we set the greenhouse gas emissions reduction target for fiscal 2030 to be 10% or more compared to the level of fiscal 2014 by referencing the CO<sub>2</sub> emissions reduction target for fiscal 2030 set by the Japan Chemical Industry Association in March 2019 (10.7% reduction compared to FY 2013).

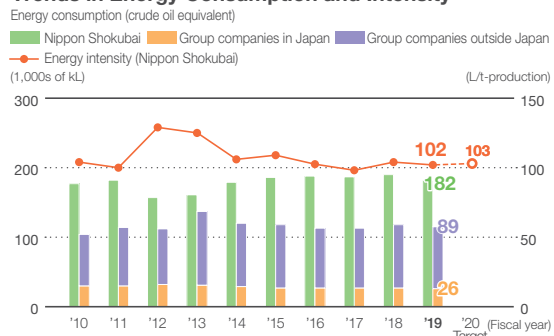
In fiscal 2019, the results of our efforts to conserve energy aimed at our fiscal 2020 targets were 102 L/t-production for energy intensity and 0.192 t-CO<sub>2</sub>/t-production for energy source CO<sub>2</sub> emissions intensity.

#### Trends in CO<sub>2</sub> Emissions and Intensity



\* CO<sub>2</sub> emissions are totals of energy source and non-energy source CO<sub>2</sub> emissions.

#### Trends in Energy Consumption and Intensity



\* The amount of energy consumed and CO<sub>2</sub> emissions do not include our head offices, research centers, plant administrative buildings or employee welfare facilities.

\* The amount of energy consumed and CO<sub>2</sub> emissions in fiscal 2019 totaled 9,000 kL and 15,000 t-CO<sub>2</sub>, respectively for our head offices, research centers, plant administrative buildings, and employee welfare facilities of Nippon Shokubai.

Our Osaka and Tokyo Offices use green electricity (biomass generation) under the Green Electricity Certificate System.<sup>1</sup>

<sup>1</sup>: Environmental value-added electricity generated from natural energy is certified by a third-party institution, and the certificate issued to the business operator can be traded as a Green Electricity Certificate.

<sup>2</sup>: A regulatory system that requires the reporting of emissions of designated chemical substances into the air, water and soil as well as the volume of waste transferred. Data compiled and submitted to governmental agencies are disclosed to the public.

## Initiatives for Eco-friendly Distribution

As a way of fighting global warming through our logistics operations, we are taking steps to reduce our CO<sub>2</sub> emission intensity and implement exhaust gas countermeasures to control air pollution.

Although changing economic conditions can affect the amount of goods we transport and our CO<sub>2</sub> emissions, we are advancing initiatives to reduce our CO<sub>2</sub> emission intensity. These include modal shifts, improved transport efficiency, introduction of digital tachometers interlocked with GPS and drive recorders, and energy-efficient vehicle operation such as minimal idling and the installation of energy-efficient tires.

## Pollution Control Initiatives Targeting Air and Water

We are monitoring our SO<sub>x</sub>, NO<sub>x</sub> and dust emissions, and we have installed denitrification equipment that we developed inhouse for NO<sub>x</sub> and dust scrubbers to prevent air pollution. For SO<sub>x</sub>, we are reducing our fuel oil consumption and progressing with converting fuel to natural gas to reduce emissions. We use the exhaust gas treatment catalysts we developed inhouse for purification of unreacted raw materials generated in production processes.

To prevent water pollution, we are using waste liquid treatment equipment to reduce the environmental impact of wastewater from production processes.

In addition to reusing cooling water for more effective use of our water resources, we have adopted high-performance activated sludge treatment equipment that can stably process even high impact substances and are working on reducing sludge waste as well.

## Waste Reduction Initiatives

Reducing waste is a necessary initiative to support the creation of a society committed to recycling. Toward the goal of achieving and maintaining "zero emissions" (defined as "reducing the quantity of waste subject to final disposal at off-site landfills to less than 0.1% of the total amount of waste generated"), we are introducing sorting for the recovery and recycling of our waste.

In fiscal 2019, we are continuing to implement our zero emissions policy by reducing the amount of waste subject to final disposal at off-site landfills. In addition to implementing comprehensive sorting for recovery and recycling, we are achieving this by redesigning our processes to reduce waste, reusing byproducts and processing product leftovers on site.

## Chemical Substances Control Initiatives

In fiscal 1995, we participated in a voluntary PRTR survey undertaken by the Japan Chemical Industry Association and have set out to reduce our emissions of chemical substances into the environment.

In fiscal 2019, we released 78 tons of substances subject to the PRTR Law, which represents a 27.2% decrease in emissions compared to fiscal 2015 levels.

As a result, we were able to achieve the reduction target for the 10th Plan ahead of schedule.

# Process Safety and Disaster Prevention Initiatives

Under the Corporate Credo “Safety takes priority over production,” all our employees take part in various activities to ensure safety.

## 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 Corporate Credo, Safety Oath, and the safety management principles below, as well as the roles of the company at each organizational level, and are ensuring that all employees stay fully informed.

### Safety management principles

We are putting into practice the fundamental principles for safety management, behavior principles during production activities and other guidelines that are established in the Safety Management Regulations of our company.

<Fundamental principle of safety management (excerpt)>

(1) Assure safety based on our Corporate Credo, “Safety takes priority over production.”

<Behavior principles during production activities>

(1) Stop operation immediately if you discover something abnormal in the functioning of equipment. No one will ask who was responsible.



Corporate Credo, “Safety takes priority over production”

## Promotion of Voluntary Safety Initiatives

Since its foundation, Nippon Shokubai has ensured safe production with the technologies we developed in-house, and the voluntary safety initiatives we have introduced are aimed at zero Class A<sup>1</sup> and Class B<sup>2</sup> severe process safety accidents.

### Efforts to prevent accidents and malfunctions

We employ HAZOP<sup>3</sup> to identify latent risks in a plant. We are working to prevent incidents by systematically implementing HAZOP for both routine and non-routine work, and also by conducting change management and non-routine work management.

### Systematic implementation of safety measures

When an accident happens, we investigate the cause in stages and introduce measures to prevent any recurrence. Long-term maintenance of facilities is incorporated in our maintenance plans and implemented according to the plans. We are also systematically dealing with the aging degradation of our facilities.

<sup>1</sup>: Level 9 or higher according to the Nippon Shokubai method on the Japan Petrochemical Industry Association chart

<sup>2</sup>: Level 3 to 8 according to the Nippon Shokubai method on the Japan Petrochemical Industry Association chart

## Earthquake preparedness

Following the Great East Japan Earthquake of 2011, we reviewed our earthquake preparedness in the event of a future major earthquake and tsunami from both the tangible and intangible aspects and are adopting the necessary measures, which are periodically reviewed and reinforced.

### Improving emergency drills

We have established disaster prevention arrangements at every workplace, and we systematically conduct a variety of emergency drills every year.

At our Himeji Plant, we conducted comprehensive emergency drills in collaboration with the Shikama and Aboshi Fire Stations. At our Kawasaki Plant, we conducted comprehensive emergency drills with the Rinko Fire Station and the local disaster prevention council, and at our Suita Research Center, we also conducted comprehensive emergency drills with the Suita Minami Fire Station.

By feeding back issues that were made apparent in the emergency drills in the next training, we will continue to review and strengthen our disaster prevention, including related arrangements, education and training.



Comprehensive emergency drill

## Maintenance and improvement of safety management efforts

Each year, RC inspections are conducted by executive management at both Himeji and Kawasaki plants. In fiscal 2019, they verified the safety management activities at both plants.

The Executive Officer of the Responsible Care Division at our Head Office conducted audits as the head of the auditing committee, to ensure continuous improvements to our safety management.

## High-pressure gas safety accredited plants

The Ministry of Economy, Trade and Industry accredited the Chidori Plant and the Ukushima Plant located at our Kawasaki Plant as “Accredited Completion Inspection Executors and Accredited Safety Inspection Executors” for high-pressure gas.

Reaccreditation inspections are conducted every five years. This accreditation permits continuous operation of high-pressure gas production facilities and autonomous safety inspections by companies with competent self-managed safety systems.

<sup>3</sup>: A safety evaluation method for systematically evaluating the adequacy of safeguards in plants and eliminating latent risks in plants through comprehensive detection

## Occupational Safety and Health Initiatives

To achieve our target of zero industrial injuries, we implement activities to ensure occupational safety and health, including improving the working environment, reducing risk factors, and creating pleasant workplaces.

### Ensuring Continuous Improvement of Occupational Safety and Health

We have been continuously improving our occupational safety and health, mainly through our Occupational Safety and Health Management System (OSHMS). In addition, we are working to reduce industrial injuries by systematically implementing various basic safety initiatives, including "kiken yochi (KY)" risk prediction, "hiyari hatto" near miss and "5S" campaigns, as well as by conducting a variety of education and training courses.

#### Risk assessment

In accordance with the Occupational Safety and Health Management System, we have been undertaking risk assessment of tasks and risk assessment of chemicals handled to reduce or eliminate the sources of risks.

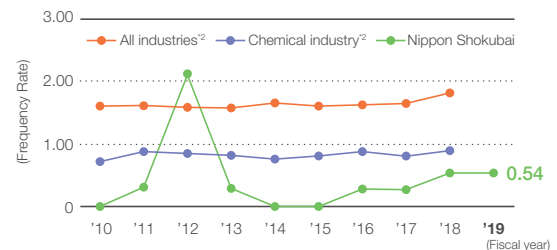
#### Occurrence of industrial injuries

In fiscal 2019, we experienced two injuries with loss of workdays and six injuries without loss of workdays. Our contractors experienced one injury with loss of workdays and five injuries without loss of workdays.

The number of industrial injuries slightly decreased from that in

fiscal 2018. We will continue to conduct various safety activities to further reduce the number of industrial injuries.

#### Trends in Frequency Rate of Injuries with Loss of Workdays<sup>\*1</sup>



<sup>\*1</sup>: Frequency rate: The number of casualties in industrial injuries per million working hours  
<sup>\*2</sup>: Source: "Survey on Industrial Accidents" by Ministry of Health, Labour and Welfare

#### Basic safety initiatives

In an effort to prevent industrial injuries, we are committed to daily safety activities targeting work-related risks. Specifically, we remain focused on our "5S" campaign in the workplace, our "hiyari hatto" practice of collecting reports on near miss incidents, and our "KY" or risk prediction campaign before work.

To maintain and enhance the sensitivity to danger, we conduct KY training and KY workshops using case sheets, with the aim of improving the level of daily safety activities.

## Chemical Safety Initiatives

To achieve our goal of zero legal and social problems related to chemical substances throughout the lifecycle of products, we are committed to managing chemicals properly through initiatives including complying with laws and regulations and providing related information.

### Comprehensive management of chemical substances throughout the product lifecycle

To achieve our goal of zero legal and social problems related to chemical substances throughout the lifecycle of products, from the R&D stage to disposal at the end of the product service life, Nippon Shokubai is committed to managing chemicals properly by implementing a variety of initiatives, including upgrading our internal systems to comply with national and international laws and regulations related to chemical products, and providing customers with information on relevant laws and regulations as well as product safety information.

#### Ensuring the safety of new products

We have introduced a gate system at each stage from R&D to commercialization. We apply our technical expertise to examine the safety of chemical products throughout the product lifecycle and determine at each stage whether to proceed to the next stage.

#### Product Safety Initiatives

We prepare GHS-compliant SDSs, warning labels, and Yellow Cards and provide information to customers while providing training sessions for our employees. Regarding application-specific products used in pharmaceutical raw materials, pesticides, cosmetics and food additives, our Product Safety Review Subcommittee conducts strict checks while ensuring compliance with the Product Liability Act.

#### Accommodating chemical registration requirements within and outside Japan

In collaboration with specialized institutions and our Group companies outside Japan, we are responding appropriately to laws and

regulations that require us to register chemical substances, including the Act on the Evaluation of Chemical Substances and Regulations of their Manufacture, etc. and the Industrial Safety and Health Act in Japan, as well as TSCA in the United States and REACH in Europe.

#### Addressing import/export controls

To ensure legal compliance regarding imports and exports, we have streamlined our process for strengthening company regulations, keeping our employees informed about whether a product has been subject to import/export restrictions and improving our shipping management system for coordination with our enterprise resource planning (ERP) backbone accounting system. We also conduct regular internal training on import/export management.

#### Promoting a voluntary initiative of the JCIA

We participate in GPS/JIPS\*, a voluntary initiative for strengthening chemical management promoted by the Japan Chemical Industry Association, which prepares and releases a safety summary to the public.

#### Establishment of a chemical substance management system

We have created and are operating a comprehensive chemical substance management system that can respond quickly to risk assessments, the issuance of SDS, and customers' requests for the survey of chemical substances contained in our products our products by providing centralized management of various types of information encompassing chemicals, raw materials, hazardous materials and regulations. We are working on updating information and improving the system functions.

\* The initiative promoted by the Japan Chemical Industry Association to achieve the UN-mandated goal of "minimizing chemical risks to human health and the environment from manufacturing and using chemical products with the aim of achieving the targets by 2020"

## Quality Initiatives

Our basic policy related to quality is to provide products and services that fully satisfy our customers while earning their trust. We also work to maintain or improve our quality levels.

### Customer satisfaction initiatives

All our plants and all Group companies inside and outside Japan engaged in manufacturing and logistics 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.

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.



Quality control convention

### Initiatives toward gaining greater public trust

We have established quality management systems that ensure the safety and reliability of our products. In response to growing social demands for product quality and reliability, the quality assurance department of our Head Office has conducted quality audits of our plants and Group companies to check the quality assurance systems and the status of quality management at all production sites.

In quality audits for fiscal 2019, both the responses to the past quality issues and the current situation on the corrective actions as a part of the initiatives to prevent recurrence of quality issues, and also the quality training for quality assurance department and the reliability of the inspection data as a part of the initiatives to ensure quality governance were inspected. Through the audits, reanalysis system and other quality matters were discussed with the both plants or the Group companies in Japan.

## CSR Activities through Purchasing

We are promoting CSR procurement throughout the supply chain toward realizing a sustainable society.

### Basic posture for CSR procurement

Toward achieving our Group Mission, “**TechnoAmenity**,” we promote purchasing activities under the Nippon Shokubai Corporate Ethics Behavior Guidelines. We sincerely ask our suppliers and business partners for their understanding of our activities and take coordinated action.

### CSR procurement initiatives

We aim to put our Group Mission into practice throughout the supply chain, from procurement of raw materials to the manufacture, sales, use and disposal of products. In our purchasing activities with our customers, suppliers and business partners, to provide safe and reliable products, we will work to disseminate the concept of CSR procurement in accordance with our CSR Concept and the Corporate Ethics Behavior Guidelines. We have also formulated the Procurement Fundamental Policy, which declares our determination to promote continuous CSR activities.

To fulfill our social responsibilities, we continue to confirm

that we do not procure so-called conflict minerals.<sup>\*1</sup> We continuously monitor the actual situations at our suppliers, and stop procurement promptly if the use of conflict minerals is discovered.

<sup>\*1</sup>: Gold (Au), tantalum (Ta), tungsten (W) and tin (Sn) that are being mined and sold by local armed groups in the Democratic Republic of the Congo and adjoining countries. Also cobalt (Co) in the CAHRAs (conflict-affected and high-risk areas).

### Green procurement initiatives

For substances that are regulated or highly hazardous, we have independently assigned them to two categories: “prohibited substances” and “restricted substances.” We are developing green products and procuring raw materials with low environmental impact while controlling the inclusion of such substances in our products.

For information transmission sheets, we have switched to those of chemSHERPA.<sup>\*2</sup>

<sup>\*2</sup> A shared system for transmitting information about chemicals contained in products to supply chains. Full-scale utilization began in April 2018.



## Corporate Ethics

We are committed to various group-wide initiatives intended to further improve and strengthen our corporate ethics and legal compliance systems in accordance with our Corporate Code of Ethics.

### Corporate ethics structure

We have established the Compliance Committee headed by the President to reinforce our corporate ethics. The Compliance Committee is responsible for deciding company-wide policies as well as medium- to long-term and annual action plans to further improve our corporate ethics and compliance, and is working to develop and improve the corporate ethics and legal compliance systems for the entire Group including affiliated companies.

### Activities to improve corporate ethics

#### Rank-based training (Group-wide program)

We provide training courses on corporate ethics targeting three specific employee ranks: managerial employees, mid-level employees, and rank-and-file employees (including entrusted workers and workers dispatched from temporary agencies). We require all employees to attend a training course at least once every four years. In fiscal 2019, we organized Group-wide corporate ethics training courses targeting employees in managerial positions of our nine Group companies in Japan, in addition to managerial employees of the Company. A total of 33 training courses were held, in which approximately 740 employees; around 500 managerial employees of the Company and around 240 employees in managerial positions at Group companies, participated.

In these training courses, trainees first reviewed the lessons of the rank-based corporate ethics training they had received and confirmed the key points in preventing misconduct. After that, they discussed in groups their awareness of preventing power harassment as managers and their decision-making criteria for “gray-zone” corporate ethical matters, thereby confirming the perspectives they should have as managers. Through these training courses, we aim to help enable the employees in managerial positions in our Group to more properly instruct their subordinates and create workplaces where misconduct can hardly occur.

#### Awareness initiatives in the workplace

Corporate Ethics Guidebook distribution to ensure the penetration and adoption of corporate ethics throughout the workplace, we conduct corporate ethics training courses for each workplace once every six months. This training has become a forum for active discussion within each workplace based on a training program that covers violations of corporate ethics and legal violations and similar actions prepared based on situations that actually arose in other companies. We have been implementing this program at our Group companies in Japan since January 2018.

#### Corporate Ethics Guidebook distribution

To ensure the penetration and adoption of corporate ethics throughout the workplace, we conduct corporate ethics training courses for each workplace once every six months. This training has become a forum for active discussion within each workplace based on a training program that covers violations of corporate ethics and legal violations and similar actions prepared based on situations that actually arose in other companies. We have

been implementing this program at our Group companies in Japan since January 2018.

We have prepared the Nippon Shokubai Corporate Ethics Guidebook, and we distribute it to our employees and revise it as appropriate. We have also prepared the Nippon Shokubai Group Corporate Ethics Guidebook for our Group companies in Japan, and we distribute it to the employees in each company. The content of these guidebooks serves to increase individual awareness of corporate ethics and supports learning activities. The books include behavior guidelines that should be followed not only in daily work but also in private life, commentaries and a Q&A section, for example. They are also effectively used for employee training.



Nippon Shokubai Corporate Ethics Guidebook



Nippon Shokubai Group Corporate Ethics Guidebook

### Awareness activities on our corporate ethics portal

Our corporate intranet hosts a corporate ethics portal titled “Understandable Corporate Ethics.” It lists various kinds of manuals including the manuals as to basic information on contracts, competition laws in various countries, observance of anti-bribery laws and subcontract law, links to websites covering related laws and regulations, and a FAQ page. This site presents the latest available information, and it is updated whenever the relevant laws and regulations are revised.



Corporate ethics portal

### Whistleblower System

As part of our initiatives to implement corporate ethics and compliance, we have established the Whistleblower System under which facts or suspicions of legal or corporate ethics violations inside the company can be freely reported to the internal reporting desks we have set up both inside and outside the company. The intention of the whistleblower is always respected in determining whether or not to disclose the details of the information and the name of the whistleblower, with the objective of protecting the whistleblower.

# Risk Management

We are implementing a variety of measures to accurately identify and respond to risks that accompany changes in the management and business environments and that could impact the long-term continuation of our Group, in accordance with our Risk Management Regulations.

## Risk Management System

We are committed to managing various internal and external risks related to our business operations properly, thereby maintaining and improving our corporate value. We have established the Risk Management Committee headed by the President in which issues related to risk management and their countermeasures are discussed and approved, with the aim of developing and enhancing the Group-wide risk management system that includes our affiliated companies.

## Risk management processes

### Overall risk evaluations (Impact × Frequency / Probability)

To effectively devise and implement countermeasures for the risks that threaten our Group, we give risks overall risk evaluations on three levels (high, medium or low) based on the impact if the risk occurs and the frequency/probability of occurrence. Among these risks, we prioritize those that are ranked high or medium and introduce risk controls for each.

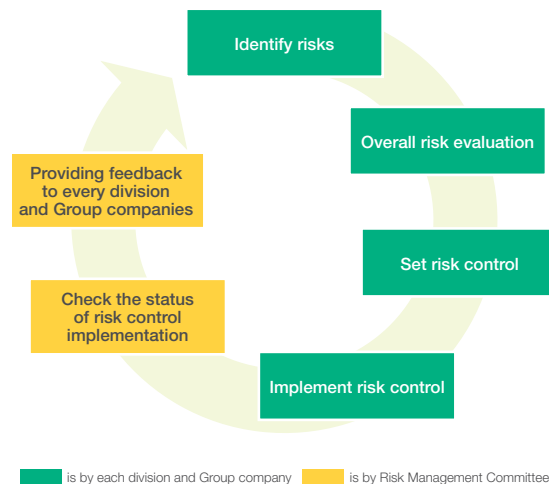
To evaluate the impact if a risk occurs at our company and the frequency/probability of occurrence, we have established multiphase evaluation criteria to ensure the objectivity and adequacy of the risk evaluation. Our Group companies also conduct risk evaluations based on the evaluation criteria established according to the scale and type of business of each company, in reference to our evaluation criteria.

		Impact		
		Small	Medium	Large
Frequency / Probability	Small	Low (priority⑨)	Low (priority⑦)	Medium (priority④)
	Medium	Low (priority⑧)	Medium (priority⑤)	High (priority②)
	Large	Medium (priority⑥)	High (priority③)	High (priority①)

## Risk management based on the PDCA cycle

To accurately determine which risks require responses, every year we distribute risk tables and risk questionnaires not only to every division in our company but also to our Group companies. We use these to identify risks, conduct overall evaluations, and check the status of risk control and implementation, for example. We are working to reduce risks by feeding back the results using a PDCA cycle.

### Outline of risk management processes



## Business Continuity Management (BCM)

We have established a Business Continuity Plan (BCP) with countermeasures for earthquakes, influenza outbreaks and other incidents. We are working to strengthen Business Continuity Management (BCM) by regularly reviewing our BCP, as well as by implementing earthquake response training and other measures.



Earthquake response training

## Our Relationship with our Employees

Under our Management Commitment to conduct all corporate activities with a deep respect for humanity, we work to provide and maintain a positive work environment while facilitating a high level of job satisfaction for every employee.

### Diversity

#### Respect for human rights

Our Management Commitments state that “we conduct all of our corporate activities based upon a deep respect for humanity” and our action guideline states that “we always strive to maintain a healthy working environment, respect the human rights of each person, and will never engage in discrimination or any other violation of human rights.” Thus our commitment is clear: we will never conduct any unreasonable act of discrimination or harassment based on place of birth, nationality, race, ethnicity, creed, religion, position, gender, age, sexual orientation or physical characteristics and are working to cultivate a culture of respecting human rights.

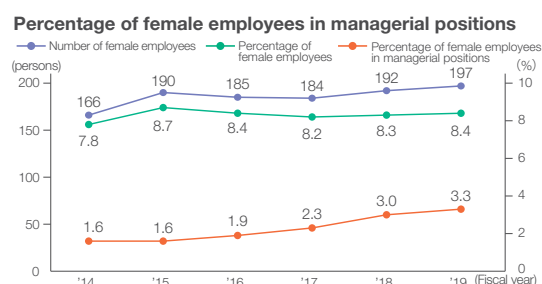
We all accept and respect each other and the personality and individuality of everyone.

#### Respecting diversity

##### Promoting female employees' active participation

Nippon Shokubai has been working actively to ensure gender neutral recruitment and institutional development. We have formulated an action plan for fiscal 2016–2020 that is intended to increase the number of female employees in managerial positions (or above the level of section manager). Our goal is to double the number relative to the fiscal 2015 year-end levels by the end of fiscal 2020.

As one measure for this plan in fiscal 2017, we gathered female managers and others together for a workshop. We also gave management training to their superiors. Based on these measures, in fiscal 2019, we launched a project with female employees as members, who identified problems regarding women's participation and advancement in the workplace at the Company and proposed solutions to the problems. We will advance new initiatives to further support the active participation of female employees.



##### Employment of foreign nationals

In anticipation of further expansion of our business across the globe, we continue to hire foreign nationals in Japan as well as in our Group companies in other countries.

##### Effective use of re-employment system

Aiming to help stabilize the lives of retired employees, we set the period of re-employment until the age of 65, ensuring employment in a familiar work environment. This initiative, intended to provide employees with a sense of security and improved motivation for work, has encouraged over 100 experienced senior employees to contribute to the handover of core techniques and the development of young human resources.

Note: Re-employment rate of retired employees: 87.0% (fiscal 2019)

##### Promoting employment of people with disabilities

We are committed to employing people with disabilities, who are playing active roles in various jobs at each of our workplaces.

Moreover, NS Green Co., Ltd., our designated Group subsidiary established from the perspective of promoting the employment of people with disabilities, is in charge of the management of green spaces of manufacturing plants, and also grows seedlings of chrysanthemum in small pots every year. The pots are distributed to approximately 300 organizations for free, thereby supporting the urban greening project by the prefectural government.

### Human capital development

#### Human resources management system

Managing mental and physical health Toward a sound labor-management relationship Structure for human resources development Work to invigorate our people and organizations forms the basis of the second half of our Medium-term Business Plan “Reborn Nippon Shokubai 2020 NEXT” and the sustainable growth of our Group.

With the theme “Think & Act,” which means always being conscious of one's accountability in order to maximize value for the customer, we have implemented a human resources management system based on Management By Objectives (MBO). We continuously review the system itself and its operation, and we are creating an improved environment in which employees are given the freedom to achieve the desired results.

##### Provisions for managers (management positions)

Managers are the drivers behind what needs to be accomplished under our medium- and long-term business plans and our “Vision for 2025.” Because these managers are motivated by the concept “Think & Act,” which means always being conscious of one's accountability in order to maximize value for the customer, this system is designed to reward those who demonstrate their best efforts in fulfilling their roles.

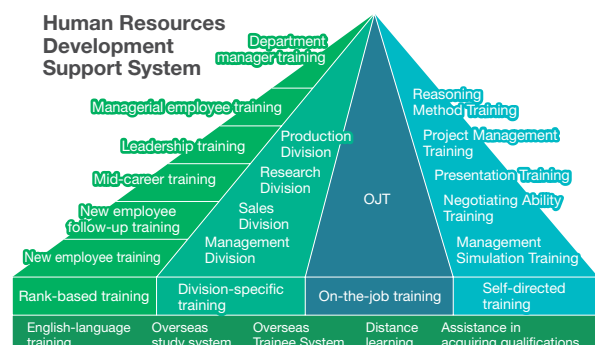
##### Provisions for non-managerial employees

We are committed to continually maintaining the current system. We conduct evaluator training, for example, with the objectives of setting more challenging and ambitious goals and maintaining the impartiality of employee evaluations, as well as maintaining and increasing relationships of trust between managers and those working under them in the workplace through evaluations and feedback.

#### Structure for human resources development

##### Personnel objectives

- (1) Self-starters capable of taking the initiative in identifying and resolving issues
- (2) Personnel capable of flexibly adapting themselves and their organizations
- (3) Personnel capable of demonstrating experience and expertise
- (4) Personnel capable of working with a diverse international community



### ● Developing human resources for leaders

We are implementing a variety of measures to cultivate leaders who can drive the organization. Specifically, the management round-table talk that had been initially held for general managers throughout the company began to be held continuously also for section managers at each business site. Moreover, training for employees being promoted and the skill development training programs for young and mid-career employees have been improved. For the development of candidate personnel for section managers in the manufacturing departments, in particular, year-and-a-half manufacturing manager training is provided.

We will continue to plan and implement programs to develop management personnel and innovative human resources.



Management round-table talk

### ● Developing human resources who will be active globally

Nippon Shokubai has over 10 overseas affiliated companies, in which over 50 Japanese expatriates are working. As our overseas sales revenue accounts for around 50% of our Group's total sales, it is increasingly important to develop human resources who can play active roles on a global scale.

We have a program to dispatch young employees to our overseas affiliates as trainees for short periods of time, and also use foreign trainers to provide training for employees who are likely to be seconded overseas to give them various multicultural skills, such as cross-cultural communication, presentation and negotiation skills.

## Promoting work-life balance

### Promoting work-life balance

#### ● Providing balanced assistance for work, child care and nursing care

To create a better environment that supports employees with their parenting and nursing responsibilities while employed, we are working to establish systems and raise the awareness of our employees. We have published a guidebook that summarizes our balanced support system to keep the users of the system informed, while working to improve the system so that users can easily obtain the understanding of and cooperation from their superiors and coworkers.

\* Number of persons taking childcare leave of absence: 23 (FY 2019 total)

\* Number of persons using reduced working hours system for childcare: 29 (FY 2019)

The Osaka Labour Bureau of the Ministry of Health, Labour and Welfare granted us an authorization for complying with Standards for General Employers under the Next Generation Nurturing Support Measures Promotion Law.



### ● Reducing overtime work hours and encouraging the taking of leave

At Nippon Shokubai, the Working Hours Management Committee has been established by both labor and management to check the monthly overtime work hours of each employee and endeavor to reduce them by formulating overtime work hour reduction plans and enhancing the flextime system. Employees who have worked long hours are encouraged to speak with an industrial physician or receive a health check via a medical questionnaire every month. Based on the results of the health check, the employee's supervisor receives guidance or instructions from the industrial physician.

To encourage employees to take leave, the company has introduced a system to allow paid leave to be taken by the hour. We will continue to make efforts to create a working environment friendly to employees by paying attention to their work-life balance.

Incidentally, prior to enactment of the law, all our employees (100%) achieved the target of taking at least five days of annual paid leave.

The percentage of regular employees who took annual paid leave was around 70% (72% in FY 2018 and 69% in FY 2019).

### Managing mental and physical health

To maintain and improve the mental and physical health of our employees, we have introduced various measures to help them to manage their health. Administered by our industrial physicians and occupational health staff, these efforts revolve around the health promotion office in each of our business offices. Specifically, we conduct general and specialized health examinations and provide tailored health advice in cooperation with the Nippon Shokubai Health Insurance Union. Together, we arrange health checks with dentists in addition to family health checks and the like. We also offer educational activities such as in-house lectures and physical strength measurement sessions on a regular basis.

We have formulated a Mental Health Plan aimed at staving off mental and physical illnesses. At the same time, we are working to improve productivity and create a bright and lively workplace by providing stress checks and rank-based training focusing on mental health education for all employees. In fiscal 2019, we held 10 sessions of line care training targeting around 550 managers throughout the company.



Mental health training

### Toward a sound labor-management relationship

Nippon Shokubai and the Nippon Shokubai Labor Union, a member of the Japanese Federation of Energy and Chemistry Workers Unions, maintain a dialogue based on mutual respect. Respecting the three rights of labor and through a good labor-management relationship based on mutual understanding and trust, we are addressing the resolution of various issues and achievement of goals through cooperation.

Regarding collective bargaining, we have specified the scope of negotiations, procedures, the method of settlement, and other matters in collective labor agreements so that various issues can be properly solved and overcome through dialogue. Moreover, meetings of the central labor-management council and meetings of the branch labor-management council at each plant are held periodically as forums for exchanging opinions between labor and management.

The company and the union have concluded a union shop agreement under which all our regular employees join the union.



# Governance

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To pursue value creation over the medium to long term and achieve sustainable growth, Nippon Shokubai works to strengthen and enhance its corporate governance by improving the effectiveness of its Board Meetings, thereby establishing a solid management foundation.

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**54** Message from Outside Member of the Board

**55** Management

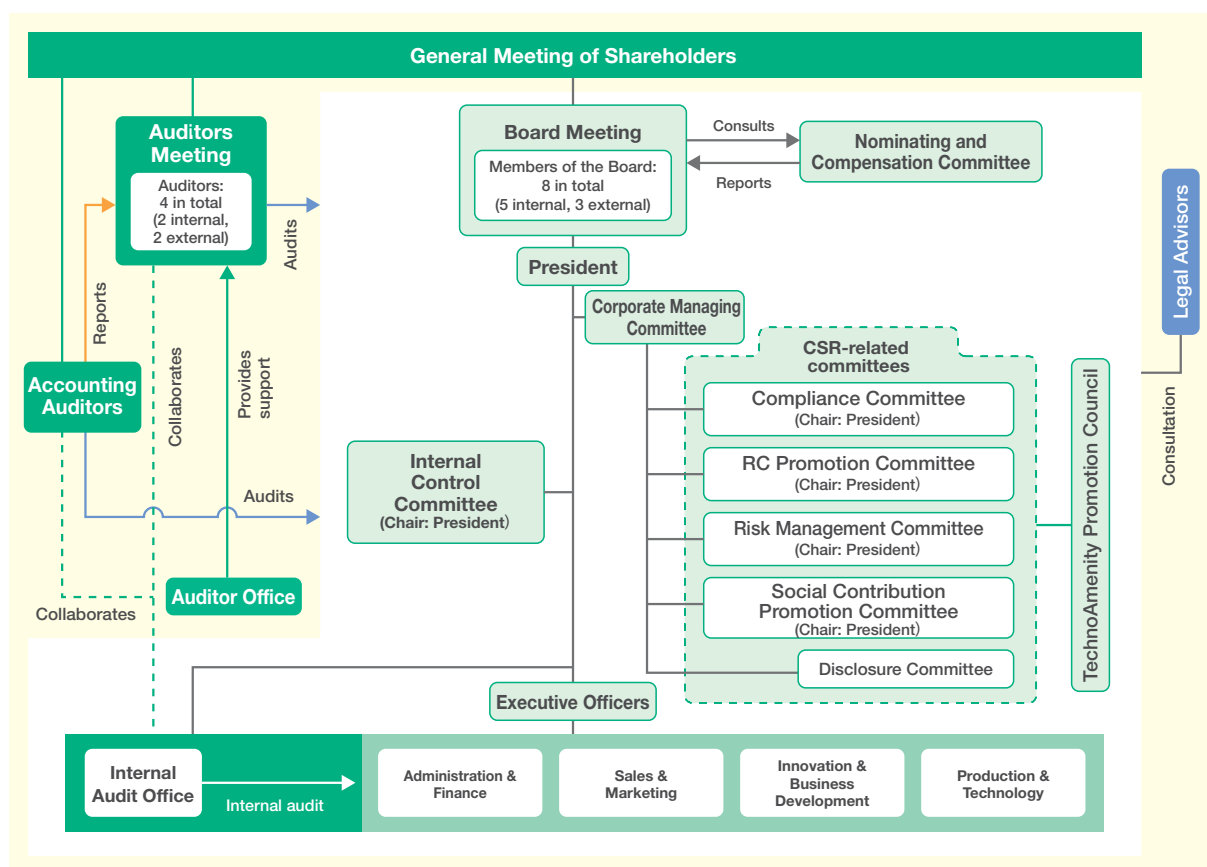
# Corporate Governance

We are working on continuously improving our systems and their operation to strengthen and enhance a viable corporate governance.

## Our basic approach to corporate governance and our corporate governance system (as of June 19, 2020)

Under the Nippon Shokubai Group's Mission of “**TechnoAmenity** — Providing affluence and comfort to people and society, with our unique technology” — our goals are to develop as an innovative chemical company that provides new value for people's lives, to earn greater trust from the public as a responsible chemical company, and to become a company that all can take pride in, including all our stakeholders. In this way we will increase our corporate value and achieve sustainable growth.

We consider viable corporate governance to be essential and have adopted initiatives toward that end. We ensure the rights and equality of our shareholders and maintain an open dialogue, collaborate with various stakeholders as appropriate, disclose information as appropriate and ensure transparency, ensure that the roles of Board Meeting and management teams relate to the appropriate execution of duties, ensure appropriate supervision of the execution of these duties and strengthen and enhance our internal control systems.



## Roles and Functions of Various Bodies and Committees

### Board Meeting

Comprising eight Members of the Board, including three Outside Members of the Board, Board Meeting supervises the business operations of each Member of the Board through reports, deliberations, and resolutions regarding important matters. In general, meetings are convened monthly under the chairmanship of a Member of the Board selected from members who are not executive officers by a resolution of the Board Meeting. Four Statutory Corporate Auditors, including two External Statutory Corporate Auditors, also attend to give advice and state their opinions when necessary.

### Corporate Managing Committee

Comprising the President and executive officers appointed by the President, this committee generally convenes twice monthly (with all executive officers in attendance at one of these meetings) to deliberate on items related to the implementation of basic policies and important management issues. Among proposals discussed by the Corporate Managing Committee, important issues are forwarded to Board Meeting for consideration.

### Auditors Meeting

Comprising four Statutory Corporate Auditors, including two External Statutory Corporate Auditors, this meeting usually convenes monthly, submits reports and engages in discussions and deliberations on important matters related to audits.

### Nominating and Compensation Committee

An advisory body to the Board Meeting, this is a voluntary organization comprising three or more Members of the Board (including a majority of Outside Members of the Board). It advises on the election/dismissal of the President and Representative Member of the Board, as well as draft nominations of candidates for Members of the Board and Statutory Corporate Auditor positions and on compensation and bonuses for Members of the Board.

### Internal Control Committee

Under the chairmanship of the President, this committee has established a system to ensure the reliability of financial reporting as enforced by the Financial Instruments and Exchange Act. It also seeks to process company operations more efficiently and effectively.

### Compliance Committee

Chaired by the President, this committee is responsible for deciding company-wide policies as well as medium- to long-term and annual action plans to further enhance our corporate ethics and compliance, with the aim of increasing comprehensive awareness of corporate ethics.

### Responsible Care (RC) Promotion Committee

Chaired by the President, this committee promotes the company's

Responsible Care initiatives. It formulates the RC Promotion Basic Plan and focuses on further improving safety and quality while addressing environmental issues.

### Risk Management Committee

Chaired by the President, this committee serves as the risk management organ in normal times and discusses issues related to risk management and their countermeasures.

### Social Contribution Promotion Committee

Chaired by the President, this committee promotes social contribution initiatives by focusing on further strengthening the company-wide social contribution policy and by formulating annual, medium-term, and long-term activity plans.

### Disclosure Committee

To contribute to management transparency and fulfill our social responsibilities while ensuring that all stakeholders have a better understanding of our company, this committee supports our efforts to disclose information on our company and Group companies fairly and appropriately and in a timely manner.

### TechnoAmenity Promotion Council

We promote CSR activities based on our belief that promoting CSR activities is implementing the Group Mission "**TechnoAmenity** - Providing affluence and comfort to people and society, with our unique technology." The Council is responsible for surveys and examinations on various issues related to our CSR, planning various CSR-related committee meetings, and compiling the progress of activities.

## Evaluation of the effectiveness of the Board Meeting

### Method of evaluating the effectiveness of the Board Meeting in fiscal 2019

Based on the results of a questionnaire distributed to all Members of the Board and Statutory Corporate Auditors, an opinion exchange meeting was held between all Members of the Board (independent external) and the President and Representative Member of the Board, and evaluations and analyses of the results were implemented. Based on these, the evaluation of the effectiveness of the Board Meeting was summarized at a Board Meeting.

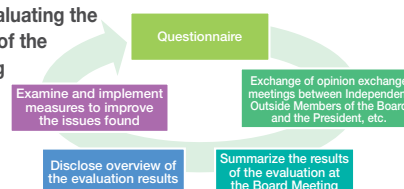
### Evaluation result

The Board Meeting was properly functioning in all aspects of its structure, operation, deliberation and reporting, supervising the execution of duties, and supporting system, and it confirmed the effectiveness of Board Meeting. It also confirmed that the measures formulated in response to the points that required improvement identified in the evaluation of the previous year as "better explanations of the important strategies and issues of our Group companies, business environment and strategies of new business, and dialogue with shareholders and investors" have been well implemented.

### Initiatives planned for the future

With a view to further increasing the effectiveness of the Board Meeting, we will make continuous efforts in response to the results of the evaluation, which showed the required improvements of continuous and more deeper explanations and discussions about the important strategies and issues of our Group companies and our existing and new business, and collaborations with our stakeholders such as shareholders and investors as well as customers and employees.

### Process of evaluating the effectiveness of the Board Meeting



## Outline of the executive remuneration system

### Policy for determining remuneration for Members of the Board and Statutory Corporate Auditors

The remuneration, etc. for internal Members of the Board of Nippon Shokubai consists of basic remuneration and bonuses. Basic remuneration consists of a fixed remuneration portion and a performance-linked remuneration portion. The index used for the performance-linked remuneration is ROA (ratio of profit before income tax to total assets). Bonuses are resolved and determined at the General Meeting of Shareholders each time payment is made, taking into account the profits for the relevant fiscal year and other circumstances.

Outside Members of the Board and Statutory Corporate Auditors receive only a basic remuneration (in principle, fixed remuneration) because remuneration linked to earnings is not appropriate for these individuals who oversee business operations from an independent standpoint.

Also, the Nominating and Compensation Committee, a voluntary organization consisting mainly of independent Outside Members of the Board, has been established to receive advice for remunerations and bonuses of Members of the Board, thereby ensuring transparency and fairness.

### Procedure for determining remuneration for Members of the Board and Statutory Corporate Auditors

Remuneration is determined by resolution at the Board Meeting upon receiving advice of the Nominating and Compensation Committee, a voluntary organization consisting mainly of independent Outside Members of the Board, thereby ensuring transparency and fairness.

## Message from Outside Members of the Board

### Predict the future and question efficiency

#### Shinji Hasebe

Outside Member of the Board

I understand that an aggressive management approach has been taken over the past year toward the establishment of Synfomix Co., Ltd. At such a time, I was able to be involved in management as an Outside Member of the Board, which was a precious experience. At the Board Meetings, I give my opinions mainly on how to build a more efficient production environment from the standpoint of a researcher in chemical engineering and system engineering. Rapid advancement of information technologies in recent years has the potential to change the systems we have had in many fields from R&D to production and sales. It is crucial in developing systems to predict the progress in information technologies 10 years from now. However, considering the massive earthquakes likely to occur in the near future, as well as the COVID-19 pandemic, I think that it is necessary not only to optimize the system by placing the highest priority on efficiency in ordinary times but also take into account uncertainties and reform the production system so that it becomes more robust. I hope I can contribute to some extent to building such a system.



### Appreciating challenges and failures, acceptance of diversity

#### Tetsuo Setoguchi

Outside Member of the Board

During the past year, although the business environment was severe, the Company proactively promoted various initiatives to improve the value of stakeholders, such as the SAP Survival Project, creation of new businesses, and business integration with Sanyo Chemical Industries, Ltd. At the Board Meetings, I feel a flexible atmosphere that allows free and open-minded discussions, while respecting the opinions of external parties. Outside Members of the Board are expected to provide objective and logical advice and supervision based on their outsiders' perspectives and experience with respect to whether the management teams make reasonable business decisions for the implementation of the Group Mission **TechnoAmenity** in accordance with the governance code and by thoroughly examining both opportunities and risks. I feel a heavy responsibility as an Outside Board Member. Meanwhile, in a rapidly changing and highly uncertain business environment, past experience may not always be useful in creating new value that will raise the corporate value. By accepting and appreciating challenges and failures, as well as conflicts arising from diversity, employees can feel motivation and pride in their work and create new value. I will make continuous efforts to improve myself to contribute to this end.






# Management

## Members of the Board Outside

		Major careers	Reasons for appointment	Attendance at meetings
	<b>Yujiro Goto</b> President and Representative Member of the Board	August 1980 Joined the Company. June 2012 Executive Officer, Plant Manager of Kawasaki Plant June 2015 Member of the Board, Managing Executive Officer April 2017 President and Representative Member of the Board (current position)	He has been playing a key role in our management as Representative Member of the Board and has achievements in executing mid- to long-term business plans. We believe that he will appropriately make decisions on our management and provide supervision based on his achievements.	15/15 Board Meetings
	<b>Koichiro Yamada</b> Representative Member of the Board, Senior Managing Executive Officer Sales, Marketing, Purchasing, Logistics Director, Superabsorbent Polymers Business Division Business Planning & Development Department	April 1978 Joined the Company. April 2007 Director, Ethylene Oxide Business Division April 2009 Director, Acrylic Business Division June 2009 Member of the Board June 2010 Executive Officer June 2013 Managing Executive Officer June 2018 Member of the Board, Managing Executive Officer June 2020 Representative Member of the Board, Senior Managing Executive Officer (current position)	He has been engaging in sales & marketing divisions and overseas services for a long time and has achievements in strengthening the sales foundation and execution of the growth strategy of each business, etc. We believe that he will appropriately make decisions on our management and provide supervision based on his achievements.	15/15 Board Meetings
	<b>Jiro Iriguchi</b> Member of the Board, Managing Executive Officer Production & Technology Production Division Engineering Division Indonesia Project DX Promotion Team	April 1984 Joined the Company. April 2004 General Manager of Fine & Specialty Chemicals Production Department, Himeji Plant April 2009 General Manager of Chemicals Production Department, Himeji Plant April 2011 Deputy Plant Manager, Himeji Plant June 2013 Director, Nippon Chemicals Co., Ltd. June 2018 Member of the Board, Managing Executive Officer (current position)	He has been engaging in production and technology divisions for a long time and has achievements in stably operating manufacturing sites and smoothly managing subsidiaries, etc. We believe that he will appropriately make decisions on our management and provide supervision based on his achievements.	15/15 Board Meetings
	<b>Kazuhiro Noda</b> Member of the Board, Managing Executive Officer Director of Corporate Planning Division	April 1986 Joined the Company. April 2005 General Manager, Superabsorbents Sales Department April 2011 General Manager, Corporate Planning Division April 2015 Deputy Director, Corporate Planning Division and General Manager, Group Management and Project Planning Department April 2017 Director, Superabsorbents Business Division June 2018 Executive Officer June 2020 Member of the Board, Managing Executive Officer (current position)	He has been mostly engaging in corporate planning and sales & marketing divisions for a long time and has achievements in planning and promoting managerial measures and strengthening the competitiveness of the superabsorbent polymer business. We believe that he will appropriately make decisions on our management and provide supervision based on his achievements.	Take office in June 2020.
	<b>Kuniaki Takagi</b> Member of the Board, Managing Executive Officer Administration, HR, Investor & Public Relations, Finance, Accounting, Information Technology Director of General Affairs and & HR Division IT Management Office ERP Innovation Project	April 1987 Joined Sumitomo Chemical Co., Ltd. April 2019 Joined the Company as an entrusted worker. May 2019 Director, General Affairs & HR Division (current position) June 2019 Executive Officer June 2020 Member of the Board, Managing Executive Officer (current position)	He has been mostly engaging in planning, administration and finance divisions and overseas services for a long time and has achievements in strengthening the corporate governance system and executing management strategies from a global perspective. We believe that he will appropriately make decisions on our management and provide supervision based on his achievements.	Take office in June 2020.
	<b>Shinji Hasebe</b> Member of the Board  External Independent	April 1993 Associate Professor, Faculty of Engineering, Kyoto University August 2003 Professor, Graduate School of Engineering, Kyoto University June 2018 Outside Member of the Board at the Company (current position) April 2019 Program-Specific Professor, the Institute for Liberal Arts and Sciences, Kyoto University (current position)	We believe that he will offer valuable opinions and proposals that would benefit our management and provide supervision from an independent position based on his expertise in chemical engineering and familiarity with the chemical industry, in addition to his past achievements as an Outside Member of the Board.	15/15 Board Meetings

		Major careers	Reasons for appointment	Attendance at meetings
 <p><b>Tetsuo Setoguchi</b> Member of the Board</p> <p>External Independent</p>		<p>April 1981 Joined Osaka Gas Co., Ltd. April 2015 Representative Director, Executive Vice President of Osaka Gas. April 2018 Director of Osaka Gas Chairman and Director, Gas and Power Co., Ltd. June 2018 Outside Member of the Board at the Company (current position) Advisor to Osaka Gas Co., Ltd. (current position) April 2020 Osaka Gas Urban Development Co., Ltd. Chairman and Director (current position)</p>	<p>We believe that he will offer valuable opinions and proposals that would benefit our management and provide supervision from an independent position based on his experience in corporate management in the manufacturing industry and at a company with high public utility properties, in addition to his past achievements as an Outside Member of the Board.</p>	<p>15/15 Board Meetings</p>
 <p><b>Miyuki Sakurai</b> Member of the Board</p> <p>External Independent</p>		<p>April 1992 Registered as an attorney-at-law. Joined Nishimura Law and Accounting Office. May 2003 Partner, Hanamizuki Law Office (current position) March 2015 Auditor, Nissay Life Foundation (current position) April 2016 Auditor, Osaka University (current position) June 2017 External Director, Nippon Shinyaku Co., Ltd. (current position) June 2020 Outside Member of the Board of the Company (current position)</p>	<p>We believe that she will offer valuable opinions and proposals that would benefit our management and provide supervision from an independent position based on her highly professional expertise and a wealth of experience as attorney-at-law and achievements as External Director of other companies.</p>	<p>Took office in June 2020.</p>

## Statutory Corporate Auditors

	Reasons for appointment		Reasons for appointment
 <p><b>Yoshihiro Arita</b></p>	<p>We believe that he will contribute valuable opinions to Board Meeting and properly audit the legality of management execution, etc. based on his wealth of experience at corporate planning, responsible care and finance &amp; accounting divisions, in addition to his past achievements as a Statutory Corporate Auditor.</p>	 <p><b>Teruhisa Wada</b></p>	<p>We believe that he will contribute valuable opinions to Board Meeting and properly audit the legality of management execution, etc., based on his wealth of experience at the general administration &amp; personnel division.</p>
 <p><b>Yoritomo Wada</b> External Independent</p>	<p>We believe that he will contribute valuable opinions to Board Meeting and properly audit the legality of management execution, etc., from an objective position, based on his highly professional expertise and a wealth of experience as a certified public accountant.</p>	 <p><b>Tsukasa Takahashi</b> External Independent</p>	<p>We believe that he will contribute valuable opinions to Board Meeting and properly audit the legality of management execution, etc., from an objective position, based on his highly professional expertise and a wealth of experience as attorney-at-law and achievements as Outside Officers of other companies.</p>

## Managing Executive Officers

Masaya Yoshida  
Yukihiro Matsumoto

Takashi Kobayashi

## Executive Officers

Kazukiyo Arakawa  
Gun Saito

Katsunori Kajii  
Masahiro Watanabe

Naoki Hijikuro  
Yoshihisa Oka

Kenta Kanaida  
Kazuhiro Sakuma

Yasutaka Sumida

Japanese GAAP	2009	2010	2011	2012	2013	2014	
For the fiscal year							
Net sales	244,317	288,345	320,704	269,520	302,136	374,873	
Gross profit	48,251	66,549	68,341	44,619	48,955	65,738	
Operating profit	13,881	29,813	31,100	10,034	13,752	26,133	
Ordinary profit	14,934	30,955	33,114	13,824	16,647	29,941	
Profit attributable to owners of parent	10,832	21,119	21,257	8,401	10,503	19,089	
Cash flows from operating activities	44,346	31,706	43,857	27,322	16,992	32,697	
Cash flows from investing activities	- 23,850	- 16,696	- 21,747	- 31,878	- 25,141	- 18,941	
Cash flows from financing activities	- 21,772	- 3,050	- 9,671	81	- 2,519	- 10,237	
Depreciation	16,234	15,619	16,767	15,402	16,995	18,971	
Capital investments	21,038	14,403	23,684	29,137	25,067	12,346	
R&D expenses	10,753	11,246	11,938	11,441	11,161	11,948	
As of the end of the fiscal year							
Total assets <sup>*1</sup>	310,946	329,332	356,407	352,373	398,396	419,634	
Net assets	163,781	194,266	209,070	220,248	242,193	270,128	
Interest-bearing debt	81,781	64,278	59,507	64,872	68,553	66,842	
Per share information							
Profit attributable to owners of parent per share (Yen) <sup>*2</sup>	60.85	110.30	104.71	41.38	51.74	470.28	
Net assets per share (Yen) <sup>*2</sup>	898.33	938.67	1,006.48	1,059.85	1,164.10	6,535.66	
Dividends (Yen) <sup>*2</sup>	14.00	22.00	22.00	16.00	16.00	120.00	
Payout ratio	23.0%	19.9%	21.0%	38.7%	30.9%	25.5%	
Management index							
Shareholders' equity ratio <sup>*1</sup>	51.4%	57.9%	57.3%	61.1%	59.3%	63.2%	
ROA (Ratio of ordinary profit to total assets) <sup>*3</sup>	4.9%	9.7%	9.7%	3.9%	4.4%	7.3%	
ROE (Ratio of profit to shareholders' equity) <sup>*4</sup>	7.0%	12.1%	10.8%	4.0%	4.7%	7.6%	
Overseas sales ratio	46.9%	46.9%	45.3%	46.5%	47.3%	51.3%	

\*1: The Company has applied "Partial Amendments to Accounting Standard for Tax Effect Accounting" (ASBJ Statement No. 28, February 16, 2018) from the beginning of FY 2018. Accordingly, the total assets and shareholders' equity ratio for FY 2017 are the values that were revised retrospectively after the application.

\*2: The Company conducted a stock consolidation of its common shares at a ratio of one share for every five shares on October 1, 2015. Dividend is the value that was presented on the assumption that the relevant stock consolidation had been implemented at the beginning of FY 2014. Accordingly, profit per share and net asset per share were calculated.

\*3: ROA (Ratio of ordinary profit to total assets) = Ordinary profit/Total assets (average of beginning and ending balance of the year)

\*4: ROE (Ratio of profit to shareholders' equity) = Profit attributable to owners of parents/Shareholders' equity (average of beginning and ending balance of the year)

\*5: ROA (Ratio of profit before income tax to total assets) = Profit before income tax/Total assets (average of beginning and ending balance of the year)

\*6: ROE (Ratio of profit to equity attributable to owners of parent) = Profit attributable to owners of parents/Total equity attributable to owners of parent (average of beginning and ending balance of the year)

\*7: The Group has prepared its consolidated financial statements in accordance with the International Financial Reporting Standards (IFRS) from FY 2018 (Date of transition: April 1, 2017).

(Unit: Millions of yen)

(Unit: Millions of yen)

2015	2016	2017	IFRS	2017	2018	2019
			For the fiscal year			
323,124	293,970	322,801	Revenue	313,939	338,869	302,150
70,001	60,471	66,137	Gross profit	67,544	66,577	53,484
31,234	21,151	26,727	Operating profit	25,610	26,170	13,178
34,342	24,664	32,293	Profit before income tax	29,805	32,119	15,748
26,003	19,361	24,280	Profit attributable to owners of parent	22,641	23,849	11,094
53,264	37,474	38,823	Cash flows from operating activities	44,206	35,918	37,499
- 12,963	- 44,515	- 27,498	Cash flows from investing activities	- 31,563	- 31,316	- 32,806
- 20,012	- 3,533	- 9,762	Cash flows from financing activities	- 10,601	- 9,982	- 7,859
17,875	17,957	16,997	Depreciation and amortization	22,918	25,626	28,653
15,156	37,289	25,827	Capital investments	30,355	29,919	30,440
12,303	13,283	13,266	R&D expenses	14,251	13,996	14,774
			As of the end of the fiscal year			
407,997	433,610	467,386	Total assets	480,316	481,668	475,641
282,485	292,275	310,762	Total equity	316,188	329,227	326,108
50,680	58,040	58,064	Interest-bearing debt	58,474	56,633	63,375
			Per share information			
640.69	478.36	608.84	Basic earnings per share (Yen)	567.71	598.05	278.21
6,870.84	7,238.33	7,705.05	Equity attributable to owners of parent per share (Yen)	7,750.24	8,099.97	8,017.17
150.00	150.00	160.00	Dividends (Yen)	160.00	170.00	180.00
23.4%	31.4%	26.3%	Payout ratio	28.2%	28.4%	64.7%
			Management index			
68.3%	66.6%	65.7%	Rate of equity attributable to owners of parent	64.3%	67.1%	67.2%
8.3%	5.9%	7.2%	ROA (Ratio of profit before income tax to total assets) <sup>5</sup>	6.4%	6.7%	3.3%
9.6%	6.8%	8.1%	ROE (Ratio of profit to equity attributable to owners of parent) <sup>6</sup>	7.6%	7.5%	3.5%
49.8%	49.0%	48.0%	Overseas sales ratio	52.8%	53.8%	53.9%



## Overview of Business Results for FY 2019 (April 1, 2019 to March 31, 2020)

The world economy in the current fiscal year saw the United States economy continuing to recover, but it was accompanied by a weak note in some countries in Europe, the decelerating economy in China, and signs of weakness in certain emerging countries in Asia. Furthermore, the outlook remained unclear due mainly to the impact of trade friction between the United States and China, the crude oil market trend, and sluggish economic activity caused by the spread of the novel coronavirus infection.

As for the Japanese economy, the country saw a slowdown in economic sentiment mainly in the manufacturing industry with weakness in exports and a drop in production.

The chemicals industry has faced an increasingly harsh business environment with sluggish demand caused by a slowdown in the world economy.

### Overview

Under these conditions, the Group's revenue in the current fiscal year decreased by 10.8% year-on-year to 302,150 million yen, down 36,719 million yen. Contributing factors included a decline in sales prices on account of a fall in raw material costs and weak market conditions for products outside of Japan, and a decline in sales volume due mainly to sluggish demand resulting from a slowdown in the economy.

With regard to profits, narrowed spreads owing to a decline in product prices in excess of the decrease in raw materials costs, as well as lower sales volume and increased processing costs such as depreciation associated with the introduction of additional facilities led to lower operating profit, which was down 12,992 million yen, or 49.6% year-on-year, to 13,178 million yen.

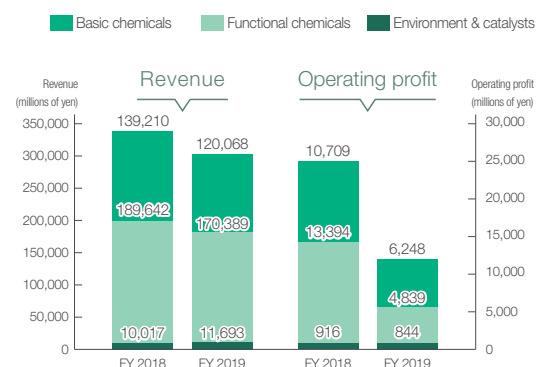
Profit before tax was down 16,372 million yen, or 51.0% year-on-year to 15,748 million yen, due to decreases in operating profit and share of profit of investments accounted for using equity method.

As a result, profit attributable to owners of parent declined 53.5% year-on-year to 11,094 million yen, down 12,755 million yen.

Furthermore, the profit before income tax to revenue ratio was lower than that of FY 2018 due to a decrease in sales volume and a decline in sales prices. In addition, the asset turnover ratio declined from FY 2018 due to a decrease in sales revenue associated with a decrease in sales volume. Consequently, ROA (ratio of profit before income tax to total assets) fell 3.4 points from 6.7% to 3.3%.

## Overview of Business Results by Segment

### Revenue and operating profit by segment



### [ Basic Chemicals ]

Sales of acrylic acids and acrylates decreased due to lower propylene and other raw material costs accompanying a drop in crude oil prices and domestic naphtha prices, declined sales prices associated with falling market conditions for products outside of Japan as a result of sluggish demand stemming from the world economic slowdown caused by trade friction between the United States and China, and decreased sales volume.

Sales of ethylene oxide decreased due to a decline in sales volume with sluggish demand accompanying an economic slowdown, and lower sales prices owing to a drop in ethylene and other raw material costs.

Sales of ethylene glycol decreased due to a decline in sales prices accompanying lower market conditions for products outside of Japan, despite increased sales volume as a result of efforts to expand sales through exports.

Sales of secondary alcohol ethoxylates decreased due to lower sales volume with sluggish demand.

As a result of the above, revenue in the basic chemicals segment decreased by 13.8% year-on-year to 120,068 million yen.

Operating profit decreased by 41.7% year-on-year, to 6,248 million yen. This was due to factors such as decreased production and sales volume, narrowed spreads owing to a decline in product prices in excess of the decrease in raw material prices, and an increase in processing costs.

### [ Functional Chemicals ]

Sales of superabsorbent polymers decreased due to lower sales prices as a result of falling propylene and other raw material costs and market conditions for products outside of Japan, and sluggish sales volume.

Sales of special acrylates decreased due to sluggish demand following the world economic slowdown caused by trade friction between the United States and China, resulting in a fall in market conditions for products outside of Japan.

Sales of electronic information material, polymers for concrete admixture, maleic anhydride, adhesive products, resin modifiers, and iodine compounds decreased due to decreased sales volume as a result of lower demand.

Sales of water-soluble polymers for raw materials of detergents and resins for paints increased due to higher sales volume as a result of efforts to expand sales.

Sales of ethyleneimine derivatives decreased due to lower sales prices and a decline in sales volume.

As a result, revenue in the functional chemicals segment decreased by 10.2% year-on-year to 170,389 million yen.

Operating profit decreased by 63.9% year-on-year to 4,839 million yen. This was due to factors such as narrowed spreads owing to a decline in product prices in excess of the decrease in raw material prices, in addition to increased processing costs such as depreciation associated with the introduction of additional facilities, and lower production and sales volume.

### [ Environment & Catalysts ]

Sales of process catalysts decreased due to lower sales volume with the time for replacement of catalysts being suspended due to economic stagnation.

Sales of fuel cell materials, materials for lithium-ion batteries, De-NOx catalysts and waste gas treatment catalysts increased due mainly to higher sales volume as a result of efforts to expand sales.

As a result of the above, revenue in the environment & catalysts segment rose 16.7% year-on-year to 11,693 million yen.

Operating profit in the segment decreased by 7.8% year-on-year to 844 million yen, on account of increased processing costs.

## Overview of Financial Position for FY 2019

Total assets at the end of the current fiscal year decreased by 6,027 million yen from the end of the previous fiscal year to 475,641 million yen. Current assets decreased by 6,812 million yen compared to the end of the previous fiscal year. This was mainly due to a decrease in trade receivables as a result of lower sales prices in line with a fall in raw materials costs and weak market conditions for products outside of Japan, and a decline in sales volume, despite an increase in inventories. Non-current assets were 784 million yen higher than at the end of the previous fiscal year. This was due to an increase in property, plant and equipment as a result of applying IFRS 16 Leases, despite a decrease in other financial assets due to a decline in the valuation of investment securities.

Total liabilities decreased by 2,909 million yen compared to the end of the previous fiscal year to 149,532 million yen. This was due to lower trade payables resulting from some unsettled liabilities from

the previous fiscal year settled during the current fiscal year because the previous fiscal year-end fell on a bank holiday, despite an increase in other financial liabilities as a result of applying IFRS 16 Leases.

Total equity decreased by 3,118 million yen compared to the end of the previous fiscal year to 326,108 million yen. This was due to decreases in net change in fair value of equity instruments designated as measured at fair value through other comprehensive income and exchange differences on translation of foreign operations that caused other components of equity to decrease, despite an increase in retained earnings.

The ratio of profit to equity attributable to owners of parent rose 0.1 percentage points, from 67.1% at the end of the previous fiscal year to 67.2%. Equity attributable to owners of parent per share decreased by 82.80 yen compared to the end of the previous fiscal year to 8,017.17 yen.

## Overview of Cash Flows for FY 2019

Cash and cash equivalents at the end of the current fiscal year amounted to 43,869 million yen, a decrease of 3,564 million yen from the end of the previous fiscal year, as cash flows used in investing activities including capital investment and cash flows used in financing activities exceeded cash flows provided by operating activities.

### ( Cash flow from operating activities )

Net cash provided by operating activities in the current fiscal year amounted to 37,499 million yen (35,918 million yen was provided in the previous fiscal year). Despite a decrease in profit before tax, settlement of trade receivables progressed and income taxes paid decreased, which led to increased inflows of 1,582 million yen compared to the previous fiscal year.

### ( Cash flow from investing activities )

Net cash used in investing activities in the current fiscal year totaled 32,806 million yen (31,316 million yen was used in the same period of the previous fiscal year). Outflows increased for purchase of intangible assets including software, which led to increased outflows of 1,490 million yen compared to the previous fiscal year.

### ( Cash flow from financing activities )

Net cash used in financing activities in the current fiscal year amounted to 7,859 million yen (9,982 million yen was used in the same period of the previous fiscal year). Despite increases in repayments of long-term borrowings and dividends paid, an increase in proceeds from borrowings for working capital and capital investment led to decreased outflows of 2,123 million yen compared to the previous fiscal year.

## Consolidated Statement of Financial Position

(Unit: Millions of yen)

	March 31, 2019	March 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	¥ 47,434	¥ 43,869
Trade receivables	81,158	74,570
Inventories	59,266	60,762
Other financial assets	8,945	9,894
Other current assets	4,768	5,663
Total current assets	201,571	194,759
Non-current assets:		
Property, plant and equipment	193,632	200,252
Goodwill	4,360	4,303
Intangible assets	9,200	10,239
Investments in associates and joint ventures accounted for using equity method	21,773	19,823
Other financial assets	38,296	33,748
Net defined benefit assets	8,149	7,540
Deferred tax assets	2,736	3,179
Other non-current assets	1,951	1,796
Total non-current assets	280,097	280,881
Total assets	¥ 481,668	¥ 475,641

(Unit: Millions of yen)

	March 31, 2019	March 31, 2020
Liabilities and equity		
Liabilities		
Current liabilities:		
Trade payables	¥ 51,866	¥ 44,741
Bonds and borrowings	20,851	17,177
Other financial liabilities	7,818	8,289
Income taxes payable	3,850	2,370
Provisions	5,178	4,879
Other current liabilities	4,464	4,971
Total current liabilities	94,028	82,427
Non-current liabilities:		
Bonds and borrowings	34,902	38,854
Other financial liabilities	1,501	7,110
Net defined benefit liability	14,119	14,509
Provisions	1,896	1,929
Deferred tax liabilities	5,995	4,704
Total non-current liabilities	58,413	67,105
Total liabilities	152,441	149,532
Equity:		
Share capital	25,038	25,038
Capital surplus	22,472	22,472
Treasury shares	-6,274	-6,281
Retained earnings	276,934	280,555
Other components of equity	4,838	-2,086
Total equity attributable to owners of parent	323,008	319,699
Non-controlling interests	6,219	6,410
Total equity	329,227	326,108
Total liabilities and equity	¥ 481,668	¥ 475,641

## Consolidated Statement of Income and Consolidated Statement of Comprehensive Income

### Consolidated Statement of Income

(Unit: Millions of yen)

	Years ended March 31,	
	2019	2020
Revenue	¥ 338,869	¥ 302,150
Cost of sales	272,292	248,666
Gross profit	66,577	53,484
Selling, general and administrative expenses	40,923	41,903
Other operating income	2,193	3,080
Other operating expenses	1,677	1,483
Operating profit	26,170	13,178
Finance income	1,771	1,741
Finance expenses	923	1,811
Share of profit of investments accounted for using equity method	5,101	2,640
Profit before income tax	32,119	15,748
Income tax expense	7,767	4,157
Profit	¥ 24,352	¥ 11,590
Profit attributable to:		
Owners of parent	23,849	11,094
Non-controlling interests	503	496
Profit	¥ 24,352	¥ 11,590
Earnings per share:		
Basic earnings per share (Yen)	598.05	278.21
Diluted earnings per share (Yen)	—	—

### Consolidated Statement of Comprehensive Income

(Unit: Millions of yen)

	Years ended March 31,	
	2019	2020
Profit	¥ 24,352	¥ 11,590
Other comprehensive income (loss)		
Items that will not be reclassified to profit or loss:		
Net changes in financial assets measured at fair value through other comprehensive income	-4,102	-3,647
Remeasurements of defined benefit plans	1,593	-523
Share of other comprehensive income (loss) of associates and joint ventures accounted for using equity method	-63	-7
Subtotal of items that will not be reclassified to profit or loss	-2,572	-4,178
Items that may be reclassified to profit or loss:		
Exchange differences on translation of foreign operations	85	-2,476
Net changes in fair value of cash flow hedges	-3	—
Share of other comprehensive income (loss) of associates and joint ventures accounted for using equity method	-992	-610
Subtotal of items that may be reclassified to profit or loss	-910	-3,086
Total other comprehensive income (loss)	-3,482	-7,264
Comprehensive income	¥ 20,870	¥ 4,327
Comprehensive income attributable to		
Owners of parent	20,455	3,875
Non-controlling interests	415	452
Comprehensive income	¥ 20,870	¥ 4,327



## Consolidated Statement of Changes in Equity

FY2018(April 1, 2018 to March 31, 2019)

(Unit: Millions of yen)

	Share capital	Capital surplus	Treasury shares	Retained earnings	Other components of equity	
					Net changes in financial assets measured at fair value through other comprehensive (loss) income	Remeasurements of defined benefit plans
Balance as of April 1, 2018	¥ 25,038	¥ 22,400	¥ -6,263	¥ 258,117	¥ 8,072	¥ —
Profit	—	—	—	23,849	—	—
Other comprehensive income	—	—	—	—	-4,099	1,516
Comprehensive (loss) income:	—	—	—	23,849	-4,099	1,516
Acquisition of treasury shares	—	—	-12	—	—	—
Cash dividends	—	—	—	-6,580	—	—
Increase (decrease) in non-controlling interests	—	72	—	—	—	—
Transfer from other components of equity to retained earnings	—	—	—	1,548	-31	-1,516
Total transactions with owners	—	72	-12	-5,032	-31	-1,516
Balance as of March 31, 2019	¥ 25,038	¥ 22,472	¥ -6,274	¥ 276,934	¥ 3,942	¥ —

(Unit: Millions of yen)

	Other components of equity			Total equity attributable to owners of parent	Non-controlling interests	Total equity
	Net changes in fair value of cash flow hedges	Exchange differences on translation of foreign operations	Total			
Balance as of April 1, 2018	¥ 3	¥ 1,705	¥ 9,780	¥ 309,073	¥ 7,115	¥ 316,188
Profit	—	—	—	23,849	503	24,352
Other comprehensive income	-3	-808	-3,394	-3,394	-87	-3,482
Comprehensive (loss) income:	-3	-808	-3,394	20,455	415	20,870
Acquisition of treasury shares	—	—	—	-12	—	-12
Cash dividends	—	—	—	-6,580	-355	-6,935
Increase (decrease) in non-controlling interests	—	—	—	72	-956	-884
Transfer from other components of equity to retained earnings	—	—	-1,548	—	—	—
Total transactions with owners	—	—	-1,548	-6,520	-1,311	-7,831
Balance as of March 31, 2019	¥ —	¥ 896	¥ 4,838	¥ 323,008	¥ 6,219	¥ 329,227

FY2019(April 1, 2019 to March 31, 2020)

(Unit: Millions of yen)

	Share capital	Capital surplus	Treasury shares	Retained earnings	Other components of equity	
					Net changes in financial assets measured at fair value through other comprehensive (loss) income	Remeasurements of defined benefit plans
Balance as of April 1, 2019	¥ 25,038	¥ 22,472	¥ -6,274	¥ 276,934	¥ 3,942	¥ —
Profit	—	—	—	11,094	—	—
Other comprehensive income	—	—	—	—	-3,642	-469
Comprehensive (loss) income:	—	—	—	11,094	-3,642	-469
Acquisition of treasury shares	—	—	-6	—	—	—
Cash dividends	—	—	—	-7,178	—	—
Increase (decrease) in non-controlling interests	—	—	—	—	—	—
Transfer from other components of equity to retained earnings	—	—	—	-296	-173	469
Total transactions with owners	—	—	-6	-7,474	-173	469
Balance as of March 31, 2020	¥ 25,038	¥ 22,472	¥ -6,281	¥ 280,555	¥ 126	¥ —

(Unit: Millions of yen)

	Other components of equity			Total equity attributable to owners of parent	Non-controlling interests	Total equity
	Net changes in fair value of cash flow hedges	Exchange differences on translation of foreign operations	Total			
Balance as of April 1, 2019	¥ —	¥ 896	¥ 4,838	¥ 323,008	¥ 6,219	¥ 329,227
Profit	—	—	—	11,094	496	11,590
Other comprehensive income	—	-3,108	-7,219	-7,219	-44	-7,264
Comprehensive (loss) income:	—	-3,108	-7,219	3,875	452	4,327
Acquisition of treasury shares	—	—	—	-6	—	-6
Cash dividends	—	—	—	-7,178	-261	-7,439
Increase (decrease) in non-controlling interests	—	—	—	—	—	—
Transfer from other components of equity to retained earnings	—	—	296	—	—	—
Total transactions with owners	—	—	296	-7,184	-261	-7,445
Balance as of March 31, 2020	¥ —	¥ -2,212	¥ -2,086	¥ 319,699	¥ 6,410	¥ 326,108

## Consolidated Statement of Cash Flows

(Unit: Millions of yen)

	Years ended March 31,	
	2019	2020
Cash flows from operating activities:		
Profit before income tax	¥ 32,119	¥ 15,748
Depreciation and amortization	25,626	28,653
Decrease in net defined benefit asset	32	91
Increase in net defined benefit liability	110	180
Interest and dividend income	-1,769	-1,736
Interest expenses	582	573
Share of profits of associates and joint ventures accounted for using equity method	-5,101	-2,640
Decrease (increase) in trade receivables	-1,653	6,056
Increase in inventories	-2,933	-2,063
Increase in trade payables	-6,928	-6,741
Other	1,212	224
Subtotal	41,298	38,343
Interest and dividends received	4,378	5,558
Interest paid	-584	-432
Income taxes paid	-9,175	-5,970
Net cash flows provided by operating activities	35,918	37,499
Cash flows from investing activities:		
Purchase of property, plant and equipment	-32,432	-32,319
Proceeds from sale of property, plant and equipment	225	2,517
Purchase of intangible assets	-243	-1,710
Purchase of investments	-4,944	-158
Proceeds from sale and redemption of investments	4,937	677
Acquisition of shares of subsidiaries and affiliates	—	-850
Other	1,140	-962
Net cash flows used in investing activities	-31,316	-32,806
Cash flows from financing activities:		
Net decrease in short-term borrowings	-518	3,005
Proceeds from long-term borrowings	3,043	10,934
Repayments of long-term borrowings	-4,556	-12,602
Payments of lease liabilities	-121	-1,751
Acquisition of treasury shares	-12	-6
Dividends paid	-6,580	-7,178
Dividends paid to non-controlling interests	-355	-261
Purchase of investments in subsidiaries not resulting in change in scope of consolidation	-884	—
Net cash flows used in financing activities	-9,982	-7,859
Effect of exchange rate changes on cash and cash equivalents	179	-399
Net increase (decrease) in cash and cash equivalents	-5,202	-3,564
Cash and cash equivalents at the beginning of the year	52,635	47,434
Cash and cash equivalents at the end of the year	¥ 47,434	¥ 43,869

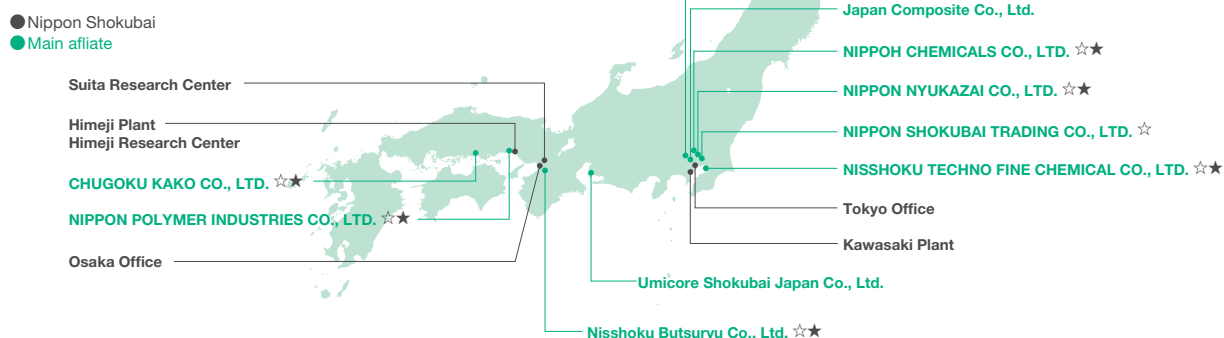
## Outline

Established	August 21, 1941	Osaka Office	Kogin Bldg., 4-1-1 Koraihashi, Chuo-ku, Osaka 541-0043, Japan Tel: +81-6-6223-9111 Fax: +81-6-6201-3716
Share capital	¥25,038 million	Tokyo Office	Hibiya Dai Bldg., 1-2-2 Uchisaiwai-cho, Chiyoda-ku, Tokyo 100-0011, Japan Tel: +81-3-3506-7475 Fax: +81-3-3506-7598
Revenue (FY2019)	¥302,150 million (consolidated) ¥204,690 million (non-consolidated)	Main Plants and Research Centers	Himeji Plant, Kawasaki Plant, Suita Research Center, Himeji Research Center
Number of employees (as of March 31, 2020)	4,510 (consolidated) 2,353 (non-consolidated)		

## Business Locations

Nippon Shokubai has established a network encompassing the fields of chemicals, processing, and transportation that can respond accurately to growing customer needs for prompt supply. Our Group was formed to ensure improved global production and a more effective supply chain (as of April 1, 2020).

### Domestic Network



### Global Network



\* For both domestic and overseas networks: ☆ Consolidated subsidiary ★ Included in the coverage of the report on responsible care activities

## Domestic Production Sites

### Himeji Plant

The Himeji Plant produces acrylic acid and superabsorbent polymers (AQUALIC CA™), the main products of the Company, as well as electronic information materials and products related to new energy and catalysts. The Plant has a research facility, which plays an important role in research on themes that require collaboration with the production segment.

**Major products**

Acrylic acid  
Superabsorbent polymers (AQUALIC CA™)  
Acrylates  
Specialty acrylates  
Oxazoline functional polymers (EPOCROS™)  
UV/EB curable materials (hybrid monomers: VEEA™)  
Catalysts for environmental purification



### Kawasaki Plant

In 1959, our Kawasaki Plant commercialized ethylene oxide for the first time in Japan. Today, one of the largest ethylene oxide manufacturing plants in Japan operates at the Plant, producing ethylene oxide and its derivative products.

**Major products**

Ethylene oxide  
Ethylene glycols  
Ethanolamines  
Secondary alcohol ethoxylates (SOFTANOL™)  
Polymers for concrete admixtures (AQUALOC™)



## Major Overseas Production Sites



Nippon Shokubai Europe N.V.



Singapore ACRYLIC PTE. LTD  
Nippon Shokubai (Asia) PTE. Ltd



PT. Nippon Shokubai Indonesia



Nippon Shokubai America Industries, Inc.



Nisshoku Chemical Industry Co., Ltd.



# TechnoAmenity

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

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Website: <http://www.shokubai.co.jp/en/>



Our company logo  
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               |

