

TechnoAmenity Report 2019





Nippon Shokubai Group Mission



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 globalstage.

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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."

- 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.
- We will create and nurture a sound, vibrant workplace, where each individual can hone their professional competence and find fulfillment in their career.
- We will develop and market products and services that are both safe and useful, based upon an accurate understanding of social demands.
- G 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.
- We will take a firm stance when dealing with unlawful or antisocial groups.
- (3) We will ensure frequent communications with our shareholders and members of society in general, and guarantee the appropriate disclosure of corporate information.
- 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.
- We will ensure the solid and sustainable development of the company through business undertakings based soundly upon the above action guidelines.

Editorial Policy

Starting from 2019, Nippon Shokubai has decided to publish "**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. This report aims to help a 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."

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.12.

Reporting period April 1, 2018 to March 31, 2019

Publication date October 2019



OUR DNA Corporate DNA Inherited over Generations

Pioneering Spirit with Vision

and the second second second

Nippon Shokubai has been in business as a growing company for more than 70 years now. The "pioneering spirit with vision" inherited from our second president, Taizo Yatagai, who is actually the founder of the company and renowned as a "passionate entrepreneur," has enabled us to create new, unprecedented values with our unique technologies that no other competitors have. Yatagai's decision to challenge the petrochemical industry laid the foundation for the development of Nippon Shokubai. As a result of the persistent R&D efforts to develop the company's proprietary technologies instead of introducing existing technologies from American corporations, our Kawasaki Plant succeeded in manufacturing ethylene oxide for the first time in Japan in 1959. Profile

Management Strategies Policies for Priority Challenges Targeting Sustainable Growth

Governance



Management that Brings Out Strengths

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 SAP manufacturing facilities to continue supplying our customers with the products they needed. The bold legacy of the Company's founders lives on at Nippon Shokubai today. The legacy of a pioneering spirit backed by vision and foresight has given Nippon Shokubai management the tools to bolster the R&D capabilities and production technologies that are our strength and take advantage of the benefits that come with being an independent company with no corporate group affiliation in forging relationships with a wide spectrum of customers. In these ways, sustainable growth has been supported by management leaders who worked to fully realize our comprehensive power, which is a combination of abilities in research and development, production technology, and marketing. Strength

R&D capabilities closely focused on customers

Strength

Strengths of Nippon Shokubai fostered through history

Strength

Production technologies adopted worldwide

STRENGTH

Strength of Nippon Shokubai (1) "R&D Capabilities"

Nippon Shokubai provides people and society with affluence and comfort through developing the materials necessary for various familiar products in our daily lives. With the aim of continuing to propose new values for society and creating innovations, we are working to enhance our market-oriented R&D capabilities.

Technologies Nippon Shokubai has strengthened

When Japan's petrochemical industry was on the rise, Nippon Shokubai began to commercialize chemical products with its unique technologies. Based on the catalysis technologies and processing technologies strengthened in those days, the company has accumulated various applied technologies, including inorganic and catalytic technologies, as well as the polymer technologies required to design and manufacture polymers with various functions, and the organic synthesis technologies required to design and manufacture unique chemical compounds with special functions.

We will further strengthen these technologies and will also acquire innovative technologies, thereby enhancing our overall R&D capabilities.

Enhancing R&D capabilities



Multi-layered research and development, from basic research that generates seeds to applied research that satisfies the needs of customers

We conduct multi-layered research and development, from basic research that generates seeds (for new businesses) to solving social challenges that will emerge in the coming 10 years or 20 years and contribute to a better society, to applied research that satisfies the real needs of customers and provides them with what they really want in a speedy and appropriate manner.

We also actively promote open innovation initiatives, such as joint research with universities and research institutes in Japan and abroad for generating seeds and technologies, and technology matching (synergize our proprietary technologies with external technologies with high potential that we are not strong in).

We will further accelerate needs-oriented research and development, taking advantage of our strengths and utilizing ties with external partners.

Profile

Management Strategies Policies for Priority Challenges Targeting Sustainable Growth

Governance

Allocation of

researchers

Research

Center

Business Division

Research

Departments

Personnel involved

in R&D

in every

emplovees

Establishing organizational structure and allocating human resources to create innovation

To accelerate both the enhancement of existing businesses and the creation of new businesses, the responsibilities of our R&D segment are clearly separated between the Innovation & Business Development Division responsible for creating new businesses and the Research Department of each Business Division responsible for enhancing and expanding existing businesses, which clarifies their respective missions.

Each Business Division, which promotes the enhancement of existing businesses and their expansion into adjacent fields, has a research department, where research resources are optimally allocated in line with our business strategies. This structure helps develop a sense of collaborate between research and marketing, encouraging the research department to conduct R&D while market/customer oriented.

The Innovation & Business Development Division, responsible for supporting the creation of new businesses, has a Research Center, where efforts are made to acquire fundamental technologies and develop next-generation materials, with a view to creating new businesses in our three priority sectors with eight areas (see P.32).

Approximately 550 of our employees—a quarter of all employees—work in R&Drelated departments. Among them, researchers are allocated to the Research Department of each Business Division and the Research Center in a ratio of 7 to 3.

The Open Innovation Cross Functional Team has been formed linking multiple research-related departments to promote the open innovation with external parties in a strategic and flexible manner, thereby accelerating the creation of innovation.





create new technologies

The second half of our Reborn Nippon Shokubai 2020 NEXT medium-term business plan states that the Company will invest a total of 57 billion yen in R&D in the four years up to fiscal 2020.

We believe that aggressive and continuous R&D investment will result in the creation of new technologies.



STRENGTH

Strength of Nippon Shokubai (2) "Production Technologies"

"Do as many things as possible ourselves" is Nippon Shokubai's traditional spirit infiltrating through all stages from production technology development to commercial production. Based on this philosophy, we have developed and evolved our unique technologies for stable and efficient production, keeping the impact of manufacturing chemicals on the environment to a minimum. These technologies have enabled us to establish a system to precisely respond to rapidly-changing market needs and manufacture large quantities of products in a timely manner.

Covering all stages from production technology development to commercial production, with our accumulated know-how

Before the launch of a new product, our R&D, production technology, engineering, and manufacturing departments work in collaboration in scaling up to mass production of the product and establishing the most efficient manufacturing processes.

Since its foundation, Nippon Shokubai has performed all processes up to production, including technology development, production process design/building, equipment and piping design, construction, and manufacturing in-house. By doing so, we have accumulated know-how and expertise in production technology and engineering that have enabled us to improve our equipment and introduce technological innovations. We have also established a system to manufacture and supply products in a timely manner, enabling us to respond precisely to rapidly-changing market needs.

Through these all-out efforts to evolve our own production technologies, we have established world-leading production technologies that are stable and efficient. We will continue these efforts so as to keep evolving and growing, thereby maintaining and enhancing our competitive advantage.

Acrylic Acid Production Technology

Stable production capabilities

Acrylic acid is a core product of Nippon Shokubai, and we have the world's top-class production capacity. Acrylic acid is known as a highly useful intermediate material for many products because of its high reactivity (polymerizability), while also being difficult to produce safely and stably because of that high reactivity.

While maintaining world-class quality and always taking on new challenges based on our accumulated know-how, Nippon Shokubai has developed its technology to ensure safe and stable production and reduce costs, thereby surviving amid severe competition and expanding its production network around the world.

Our technology for manufacturing various chemical products is highly acclaimed in the industry. About half of the plants around the world producing acrylic acid by gas-phase oxidation have adopted our production technology. Production capacity 880,000

tons/year

Profile

Management Strategies Policies for Priority Challenges Targeting Sustainable Growth

Superabsorbent Polymers (SAP) Production Technology

Functions and quality that meet customer demand

SAP, along with acrylic acid, is a core product of Nippon Shokubai, boasting the largest share of the global market. It is a functional chemical material used mainly for sanitary products such as disposable diapers. Various functions are required simultaneously, including water absorption capacity, water absorption speed, and water retention capacity. The functions and quality required also vary depending on the customer.

We believe that the key to differentiating our products from others lies in supplying the functions and quality that meet the demands of our customers, as well as cost competitiveness.

To achieve this, our research and development must identify the needs of customers precisely and create differentiated value. At the same time, based on the knowhow we have accumulated so far, we are constantly working on improvements to our production technology by introducing state-of-the-art techniques.

We continue to implement various cost-cutting measures to enhance competitiveness, and aim to achieve sustainable growth as a leading global company, firmly grounded in the excellent functions and quality of our products.



Source of Competitive Advantage

Research and development capabilities in 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 wheels that have enabled us to generate products that precisely meet the needs of our customers. This fusion of R&D and production technology capabilities has also been a source of our competitive advantage.



For example, acrylic acid, which is one of our core businesses, is produced by direct oxidation of propylene employing our unique catalyst technology. We are honing our catalyst technology to achieve highly efficient and stable production. Superabsorbent polymers are produced from acrylic acid as the raw material, using polymer technology. Our ability to produce our own acrylic acid, which is the raw material for superabsorbent polymers, instead of purchasing it from other companies, helps maintain and enhance our competitive advantage in product quality and cost.

HISTORY

Numerous Industry Firsts in Japan and Worldwide

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 in Japan

First Commercial Production of Phthalic Anhydride

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.

1970

•1941

1959

Successful Ethylene Oxide Production





In the 1950s, many Japanese petrochemical companies were reliant on imported technologies. We changed that by using our own catalytic oxidation technology to commercialize ethylene oxide. This contributed significantly to the development of the domestic petrochemical industry, and ethylene oxide applications now range from polyester raw materials

and construction products to detergent raw materials.

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

A New Acrylic Acid Production Process



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.

Profile

Management Strategies Policies for Priority Challenges Targeting Sustainable Growth

First in Japan Governance

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.

*We are the top producer (as of April 2019, according to Nippon Shokubai research) in the global superabsorbents market and operate a worldwide production system.



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.

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



•1985 2006 • 2012 • •2015

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. Mass Production Technology for IONEL[™] electrolyte for lithium-ion batteries



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.





Business Development

Outline

Established Au Share capital ¥2 Revenue ¥3 (FY2018) ¥2 Number of employees 4,4 (as of March 31, 2019) 2,5

August 21, 1941 ¥25,038 million ¥338,869 million (consolidated) ¥232,222 million (non-consolidated) 4,454 (consolidated) 2,306 (non-consolidated)

Osaka Office

Tokyo Office

Main Plants and Research Centers

Kogin Bldg., 4-1-1 Koraibashi, Chuo-ku, Osaka 541-0043, Japan Tel: +81-6-6223-9111 Fax: +81-6-6201-3716 Hibiya Dai Bldg., 1-2-2 Uchisaiwai-cho, Chiyoda-ku, Tokyo 100-0011, Japan Tel: +81-3-3506-7475 Fax: +81-3-3506-7598 Himeji Plant, Kawasaki Plant, Suita Research Center, Himeji Research Center

Major Product Lines

Environment & Catalysts

3.0%

Automotive catalysts, De-NOx catalysts, dioxins decomposition catalysts, process catalysts, waste gas/wastewater treatment catalysts, materials for fuel cells, materials for lithium-ion batteries

Functional Chemicals **55.9**%

Superabsorbent polymers, special (meth)acrylates, intermediates for pharmaceuticals, polymers for concrete admixtures, electronic information materials, iodine, maleic anhydride, resins for adhesives, resins for paints, adhesive products

Sales ratio by business segment (FY2018, consolidated)

Basic Chemicals

Acrylic acid, acrylates, ethylene oxide, ethylene glycol, ethanolamine, secondary alcohol ethoxylates, glycol ethers

Major Financial Data (consolidated)

Revenue



Operating profit



Profit attributable to owners of parent



Major Non-financial Data (non-consolidated)





'16 '17

'18 (Fiscal year)

0

'14 '15

Trends in Frequency of Injuries with Loss of Workdays





Major Overseas Production Sites



PT. Nippon Shokubai Indonesia



Nippon Shokubai Europe N.V.



Nippon Shokubai America Industries, Inc.



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



Nisshoku Chemical Industry Co., Ltd.

Nippon Shokubai's Businesses

Nippon Shokubai has developed "catalysts," which are indispensable for manufacturing chemicals, and has continuously honed their development technologies. These technologies are employed in the production of basic chemicals such as acrylic acid and ethylene oxide, the development and production of high value-added functional chemicals, which are produced with the basic chemicals as raw materials, and the production of environmental catalysts and process catalysts. This organic expansion of technologies has enabled us to create "superior materials" that are useful to society.



Process catalysts

Automotive catalysts

Dioxins decomposition catalysts

Waste gas and wastewater treatment catalysts

Catalysts

creates "superior materials" with high added value.

- Offering basic materials for various industries.
- Basic chemicals, such as ethylene oxide and acrylic acid, are used also as raw materials for our own functional chemicals.

Unique product lineups

- Production and sales of monomers with a variety of functions
- Unique polymers and other functional products using our own materials



Nippon Shokubai's Business Segments

Chemicals are transformed into materials and products that help make our life convenient and comfortable in all activities involving food, clothing and housing, and are used in various parts of our daily life. Nippon Shokubai operates businesses in the three segments of basic chemicals, functional chemicals, and environment & catalysts, contributing to the development of society as a valued partner for customers in all fields.

Basic Chemicals

Producing chemical raw materials for a variety of fields and purposes

Our basic chemicals business covers acrylic acid and ethylene oxide, as well as their derivative products. Especially, acrylic acid is one of our core products used as a chemical to produce the raw materials for a variety of fields and purposes, and we provide the world's largest production volume.

Derivative products of acrylic acid that our basic chemicals business deals with include acrylates, used for paints and adhesives, while derivative products of ethylene oxide include ethylene glycols, used as raw materials for polyester fibers and PET bottles, and secondary alcohol ethoxylates (SOFTANOL[™]), which are non-irritant and biodegradable and thus effective in improving the performance of detergents.

Acrylic acid and ethylene oxide are not only the pillars of our revenue but also the source of a variety of derivative products.





Applications in parentheses

6 CLEAN W

Acrylates (paints)





Ethylene glycols (PET bottles) Acrylates (adhesives and tackifiers)



Functional Chemicals

Contributing to the reduction of environmental impact and the creation of an affluent society

From basic chemical raw materials such as acrylic acid and ethylene oxide, our functional chemicals business uses our unique technologies to produce a range of high value-added derivative products, contributing to a reduction in environmental impact and the creation of an affluent society.

Our superabsorbent polymers (AQUALIC[™] CA), which absorb 100 to 1,000 grams of water per gram of polymer, are not only used as the material of 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 the environmental protection.

Polyethyleneimine(EPOMINTM) or polymerized ethyleneimine, our special monomer, has been in increasing demand as a raw material for water treatment agents in response to tightening environmental regulations worldwide. New applications, such as in cosmetics and gas absorbents, are also being considered.

ACRYVIEWA[™], a high-performance acrylic resin with outstanding optical properties and heat resistance, ZIRCOSTAR[™], dispersed zirconia nanoparticles with a high refractive index and high transparency that help increase brightness, and ACRYCURE[™], suitable as a binder or dispersing resin for color filter resists with excellent heat-resistant colorability and pigment dispersibility, contributing to the improved performance of displays for TVs, smartphones and tablets.

Polyvinyl pyrrolidone has good solubility in water and organic solvents, as well as high compatibility with resins, moisture absorbency, and membrane forming capacity. Taking advantage of these properties, it is used as a material in a broad range of fields: industrial applications such as in adhesives, cosmetic applications such as in hair treatment products, and food and medical applications.

Targeting Sustainable Growth

Environment & Catalysts

Contributing to solutions to climate change, air/water pollution, etc.

Our environment & catalysts business deals with De-NOx catalysts and dioxins decomposition catalysts for the purification of waste gas from power plants, waste incinerators and factories, and wastewater treatment catalysts for catalytic wet air oxidation, capable of efficiently oxidizing and decomposing harmful substances in wastewater from plants, thereby contributing to conservation of the environment.

These days, the market for electric vehicles (EVs) has been expanding in response to the global requirement for a reduction in emissions of greenhouse gases (GHG), which are one cause of climate change. Nippon Shokubai contributes to the reduction of GHG emissions through its electrolyte LiFSI (Lithium bis (fluorosulfonyl) imide, IONEL™), which dramatically improves the performance of lithium ion batteries installed in EVs. In addition to contributing to reducing GHG emissions, the Company also offers electrolyte sheets for solid oxide fuel cells that are highly effective in saving energy use.

Production of "catalysts," after which our company is named, is the origin of all our businesses today. Faced by mounting global scale challenges, including climate change, which is worsening year by year, and pollution of air and water, our environment & catalysts business is committed to tackling these challenges.





Catalytic dioxin decomposition and removal system



2-(2-vinyloxyethoxy) ethyl acrylate (VEEATM) is used as a reactive diluent for digitized or on-demand UV inkjet printing, while oxazoline-functional polymer (EPOCROS™) is used as a waterborne crosslinker for PET films and coating materials, contributing to reducing the environmental impact.

Polymers for admixtures to reinforce concrete (AQUALOCTM) are used for large bridges and roads, which must be highly durable, contributing also to building safe and secure communities.

Applications in parentheses



AQUALIC[™] CA (disposable diapers)



ACRYVIEWA[™], ACRYCURE[™], etc. VEEA[™] (UV inkjet printing) (LCDs)



AQUALOC™ (polymers for concrete admixtures)



Applications in parentheses



Nippon Shokubai's Plants

Nippon Shokubai has its manufacturing plants in the coastal areas of Himeji in Hyogo Prefecture and Kawasaki in Kanagawa Prefecture. Under the Corporate Credo "Safety takes priority over production," the two plants make constant efforts to maintain and enhance their production technologies and deliver the products in their respective strong areas.

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

Further advancement based on the acrylic acid and superabsorbent polymer businesses

In response to changes in market and demand trends and to develop the business further, the Plant expanded its production capacity for acrylic acid from 460,000 tons/year to 540, 000 tons/year in 2014, and for superabsorbent polymers from 320,000 tons/year to 370,000 tons/year in 2016, as part of the constant efforts to improve the foundation of our core businesses. To increase the acrylic acid yields and product life, development of improved catalysts is also continuously underway. Moreover, as the mother plant, it supports overseas subsidiaries with technology improvements and capacity expansion for the two major products.

At the same time, production facilities for other products in good demand, such as EPOCROSTM and VEEATM, are also being further developed.

The Plant is implementing various other initiatives, including enhancing cogeneration facilities in preparation for an increase in the demand for both electricity and steam, and introducing environment-friendly industrial water intake equipment, to reduce energy costs and the environmental impact.



Acrylic acid plant



Use of big data and database to further develop production technology

Himeji Plant formed a cross-departmental working team in 2016 to collect/accumulate information using big data and IoT and visualize/analyze the data, and to discuss how to use the information to improve the efficiency of various work operations.

The team also worked to establish an environment for the improvement of production technology by creating a database of production technology and collecting and utilizing the "know-why" information. To ensure that professional knowledge at the Plant and the principle of "seeking improvements without being asked" are shared and put into daily action, various training materials, the working team and the database are employed to make information visible and usable, ready to be put into action.

These initiatives have resulted in stability in quality and other improvements. We will continue to make efforts to enhance our production technology capabilities.

Image of making information "visible" and "usable"



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[™])

Developing facilities to stabilize the ethylene oxide business

In line with the "selection and concentration" of ethylene oxide products with a view to achieving the goals of the second half of the medium-term business plan, the Kawasaki Plant developed the production facility for secondary alcohol ethoxylates (SOFTANOLTM) and set up a new manufacturing facility for ethylene oxide adducts in the east district of the Chidori Plant in 2017, and developed the facility for N-Vinyl pyrrolidone in 2018.

As part of the facility improvement initiative to reduce environmental impacts, the Plant modified the ethylene oxide plant equipment so as to reduce emissions of dioxane by over 99%.

To ensure stable operation of the ethylene oxide business in the long term, the Plant will renew aging equipment based on plant inspection and life prediction, and improve the equipment to respond flexibly to demand trends.



Ethylene oxide plant at the Chidori Plant



Simulator training to improve the knowledge and skills of young operators

The Kawasaki Plant has a systematic training program to enable all members to acquire the minimum necessary operator skills for its manufacturing equipment. The training program focuses particularly on young operators who have worked for the Company for three to 10 years.

In the training using a simulator, the trainees practice non-routine operations such as starting and stopping the oxidation reactor and rectifier at the ethylene oxide manufacturing facility, and learn how to respond to faults such as a pump stopping during routine operations.

The simulator training is incorporated in the training curriculum for operators and the level of their operation knowledge and acquired skills are checked and evaluated quantitatively. If it proves effective, this program will be employed across the entire manufacturing segment.

The knowledge and skills acquired by simulator training are evaluated.



Management Strategies

Message from the President

8

To help people and society always remain affluentandcomfortable, we support "affluence of mind" by collaborating and connecting with our stakeholders.

Yujiro Goto, President

Jujiro Goto

Profile

Management Strategies Policies for Priority Challenges Targeting Sustainable Growth

Our aspiration represented by our Group Mission "**TechnoAmenity** – Providing affluence and comfort to people and society, with our unique technology"

Pride in nearly 30 years of awareness and implementation of sustainability

Our Group Mission "**TechnoAmenity**" was formulated in 1991, the 50th anniversary year of the company. It was proposed by Mitsuru Nakajima, the then Chairman, who said that the upcoming 21st century would be the era in which harmony between science & technology and human culture should be pursued, and that the entire Company should be aware of the concept of amenity.

What is "amenity" in the first place? The Group Mission states that it refers to affluence and comfort for people and society. In other words, it is a healthy, convenient, pleasant, and attractive environment with hope for the future that people are happy to live in, in harmony with nature and culture. This is perfectly consistent with the Sustainable Development Goals (SDGs) advocated by the United Nations. We have developed an awareness of and implemented this for the last 30 years. With the pride and a sense of mission as a pioneer, we maintain and pass on this Group Mission as part of our DNA.

In terms of business, "amenity" can be defined as

the act of offering businesses, products, and services that directly contribute to "amenity." It also means the indirect, continuous efforts by a manufacturer not to generate CO2 and other hazardous wastes in production processes. It is thus important for us to become a company that contributes to "amenity" in all stages of its supply chain, from research and development to production, use, and final disposal. To become such a company, I believe, is to retain the trust of society. In terms of management, "amenity" refers to continuous and healthy growth. This leads to "amenity" for all our customers and stakeholders.

To ensure that all our employees fully understand what our mission is and what we are working to achieve every day, it is necessary to communicate our management stance in clear and easy-to-understand language. However, the language of our Management Commitment and Code of Conduct established under the Group Mission now appears to need clarification, and we are now involved in a Group-wide initiative to restate our Group Mission in simple language.

* The Group Mission was set in 2014 to clearly declare our Group-wide commitment to implement **TechnoAmenity**.

Aim of Vision for 2025

We want to offer "affluence of mind," which will lead to further growth.

For the Company, as I mentioned earlier, sustainable growth is also very important . However, if we pursue only increased sales and profits, we may forget our mission. Nowadays, when society is rapidly changing, my biggest mission as President is to show consistent growth strategies based on the Group Mission while having a management vision, and to make our management stance understood by all employees. We must focus on the areas in which the technologies we have accumulated can be used to the full, thereby maximizing our contribution to society.

Meanwhile, chemical materials have no limits. They can contribute to all products in all industries. Our Vision for 2025 is to become an innovative chemical company that provides new value for people's lives. To achieve this, we must keep asking ourselves what new value is. The pursuit of material affluence has no end. For this reason, we not only offer products, but also support affluence of mind by broadening a little the scope of the work we are now doing. For example, the hygienic environment necessary for living, care for the elderly, and a healthy environment that supports childcare. We want to advance our business in a manner associated with providing these values.

To achieve affluence of mind, it is first important to ensure your family has a comfortable living environment. Such family environment will gradually expand to make a comfortable society to live in, and finally a rich natural environment and societies on a global scale. How wonderful it would be if our business could be of help in offering opportunities to become part of such an environment. Our aim is for our work not only to produce economic effects, but also to be associated with affluence of mind and contribute to society.

Growth strategy

Transforming social issues from risk to opportunity

However, we cannot be optimistic about the situation in today's world. In recent years, we have experienced natural disasters that were more severe than ever, presumably due to climate change. Marine pollution from plastic waste has also been a serious concern and the government is accelerating the tightening of regulations, which significantly affects the chemical industry. Companies that cannot keep up with these trends will consequently undermine their own corporate value. When we develop a new product, the product cannot survive unless the product concept considers both the environment and society. This is because our customers are demanding that we offer products or services with "amenity" managed throughout the entire supply chain. And this demand is becoming stronger. Superabsorbent polymers (SAP), for example, are one of our main products and used for disposable diapers. Although their function and convenience are recognized, we are now required also to consider how we dispose of them. Unprecedented ideas are required, such as changing the raw material of SAP from petroleum-based to plant-based to achieve carbon offsets.

Since we provide only a part of the materials, we must cooperate with other material manufacturers and logistics businesses to take comprehensive action instead of working independently on our own. Today, joint efforts by the entire industry have been increasingly respected by society.

Creation of innovation

We are renewing our R&D structure with "foresight" and "speed."

As the required level of our products increases, the process of commoditization also speeds up rapidly. The appearance of the world is rapidly changing. In such a rapidly-changing world, it is difficult to gain returns from our investment if we stick to the conventional approach. I see this as a significant risk in business management. It is therefore crucial to have the foresight to uncover, from commonplace information, deeper meaning and intentions, such as how our technologies can be utilized and what the real needs of society are.

Under these circumstances, two years ago we launched large-scale organizational reform of research

and development. In the coming era, researchers should not stay inside their research laboratories. Researchers must have the mindset of managers, capable of determining from small conversations the real needs of customers and promptly providing them. Amid intensifying competition, foresight and speed determine whether we will win against the competition. Organizational reform has generated a sense of unity between sales and research, and is beginning to show positive effects in creating new ideas and expediting decision making.



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

10 mar 2

Increase in sales and profit in FY2018 Steady progress toward the goals in 2020

The period from FY2017 to FY2020 is the second half of Reborn Nippon Shokubai 2020 NEXT, our medium-term business plan. The policies that prioritize the challenges for this period are "Strengthen the competitiveness of SAP business" and "Accelerate the creation of new businesses and products." Major targets toward sustainable growth are "Develop an active corporate team and organization," "Enhance the confidence of stakeholders," and "Strengthen our Group management," and the plan aims at establishing a foundation for our Group's further strong growth for the next decade by 2020.

Strengthen the competitiveness of SAP business

Regarding SAP business, our core business, the scale of the global market is said to be approximately 3.05 million tons in 2019. Our production capacity is 710,000 tons per year, accounting for a quarter, the largest share in the world. A quarter of the global market is, however, a figure that could be overthrown anytime. The situation is so severe that we should not be satisfied only with occupying the largest share.

The launch of the SAP Survival Project, designed to enhance the competitiveness of SAP business, has enabled all Group companies to share this sense of crisis over SAP business. In response to my call for all Group companies as part of this project, over 2,000 ideas on who to tackle this situation were proposed. These ideas have already been put into practice. Some of the cost reduction measures are beginning to show effects and have been shared by all our operation sites around the world.

Streamlining of processes is also necessary. We need to build a system that gathers all operation data from around the world in one place, based on which all processes from production to inventory control and sales can be appropriately connected. This requires the advanced technologies of IoT and AI. Many of our employees have volunteered to work on this theme. Thus, the sense of crisis, or the task of "SAP survival," has raised our motivation and generated a sense of unity, clarifying the role of each member. The project allows each member to choose their own role. And this attempt has been showing steady effects. I feel that the SAP Survival Project has significantly reinforced a sense of unity across the entire Group.

Accelerate the creation of new businesses and products

We target three sectors with eight areas for our new businesses, focusing on themes with high potential. The progress of each project is managed by a companywide, cross-departmental project team or task force. For long-term themes, in particular, which involve many issues that cannot be solved solely by our company, a budget for strategic investment, including M&A, is prepared. Strategy meetings are held at least once every six months to discuss the progress and change the strategy depending on the situation.

When we intend to expand our business in cooperation with other companies, vision and foresight are important in finding a prospective market or aiming at a niche. To get the information that helps make such decisions, we must visit our customers and catch the latest potential needs for the future. This may help establish a relationship of trust with customers and requests suggested by customers may become seeds for our new business. Our relationship with our customers is thus very important.

In the health and medical sector, for example, our technologies for chemical synthesis and refining, as well as larger-scale processing technologies, can prove most useful particularly at the stage of clinical trials. By entering the medical industry, where outsourcing has been increasing, we can offer our value at the clinical trials stage. At the same time, we focus on sectors in which we can exploit our technologies, thereby securing returns from the investment. As in other sectors, any one product has several uses. A use can be developed into a business if there are customers for such a use. And the key to developing the business is to find a suitable partner to collaborate with. I think that working jointly with a top manufacturer in the sector is an effective strategy.

In the case of a long-term theme, however, it is very difficult to determine whether it should be continued or not. As a criteria for determining this, I try to measure the motivation of the persons in charge. It's no good to be stubborn. But it is important to have the motivation.

In working on a long-term theme, I always tell "don't hurry," "don't be too confident," and "never give up." Policies for Priority Challenges Targeting Sustainable Growth

Especially when you are required to make persistent efforts for a long period of time to accomplish a task, you may easily stumble along the way. In such situation, you must have the patience to struggle all the way through, or a strong will to never give up. I always tell staff members, "don't hurry," "don't be too confident," and "never give up."

Targeting sustainable growth

The power of human resources is crucial to creating sustainable values and continued growth. We have formed Workstyle Innovation Committee, under which we are currently implementing various measures to revitalize people and organizations.

Placing emphasis on developing human resources for our future leaders and managers, we are formulating an educational framework to systematically train young employees, including those of foreign nationality, who will become leaders and managers. Prospective leaders and managers for the future are selected based on whether they have aggressive goals, as well as whether they are trusted by the people around them; in other words, whether they have the right personality.

Now, how can we develop human resources capable of generating innovation? Innovation is the result of inspiration. But I believe that it is persistence and experience that generate innovation. Then how does a person actually innovate? First, a researcher goes out of the company with a sales representative, to get to know and experience the needs of the customer, society and the world, as well as the different cultures of the world. Then, from that experience, the researcher finds a problem, think persistently and deeply to find a solution to the problem, and finally comes up with an inspiration. It is impossible, however, for the researcher to give concrete shape to the inspiration on their own. Collaboration or connection with other parties is necessary. Here, the right personality becomes important.

I want young people to have all kinds of experiences. No matter whether the experience resulted in a success or failure, I want them to think carefully whether the processes used to reach the result were good or bad. Experience makes you interested in many things. From this interest, you may discover problems from the people you meet, and come up with an inspiration from your persistence in searching for a solution. There is no need to fear small failures. I hope that allowing employees to have all kinds of experiences will help them to grow, and develop their personality.

The key to sustainable growth is that we continue to be a company trusted by society and that the people working in the company can remain safe and healthy. In 2012, we had a large explosion. As a chemical business, we should not be in business unless we can ensure safety in our work. This is a principle that we must always abide by.

Conclusion

A company that employees feel proud to work in, and that can contribute to society

I believe that the most important role of management is to respect the people they are managing, and that this will produce the right results. We therefore must ensure that this company is a place where each employee can work enthusiastically and with pride in the company. And by communicating this as the aim of the company, we want society to trust and value us as a company. I want all our stakeholders to feel proud of us as a company that really contributes to "amenity." Our organization is totally committed to this goal.

Management will continue to work hard to implement the Group Mission " **TechnoAmenity** – Providing affluence and comfort to people and society, with our unique technology" and this will contribute to creating a sustainable society. Management Strategies

CREATE VALUE

Nippon Shokubai's Value Creation

Under the Group Mission " TechnoAmenity - Providing affluence and comfort to people and society, with our unique technology," Nippon Shokubai is working on value creation in its five business sectors. The pioneering spirit and management capabilities, which have been passed on since our foundation, are the source of our strengths. By maintaining and evolving our unique strengths in R&D capabilities and production technologies, we have been creating innovations. We contribute to improving people's health and sanitation, addressing climate change and energy issues, and creating a convenient and comfortable society, thereby improving our corporate value.

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

Inherited DNA Strength Strengths ➡ P.5 **R&D** capabilities Social issue **Techno** Amenity closely focused on customers Production technologies adopted worldwide ROA / Source of strengths ► P3 **Pioneering spirit** and management capabilities

Vision and Strategy

/ision ➡ P.27

Vision for 2025

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

Market needs

Strategy

The second half of the medium-term business plan

"Reborn Nippon Shokubai 2020 NEXT"

Numerical targets for 2020 (IFRS)*

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

Str

Management Strategies Policies for Priority Challenges

the same

Targeting Sustainable Growth

Governance

Business → P.15,33

Business sectors (by use)



Achieving sustainability

Value

Comfortable lifestyle

Help achieve a convenient and affluent 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

VISION

Business Plan for Achieving the Vision

In the second half of its medium-term business plan "Reborn Nippon Shokubai 2020 NEXT," Nippon Shokubai commits to becoming an innovative chemical company that provides new value for people's lives as Our Vision for 2025. To achieve this Vision, we are working on policies to strengthen the competitiveness of SAP business and accelerate the creation of new businesses and products to tackle priority challenges.

FY2014 - FY2016

The first half of the Medium-term Business Plan

Nippon Shokubai formulated its long-term business plan "Reborn Nippon Shokubai 2020" for the period from FY2014 to FY2020, and also it's Medium-term Business Plan as the action plan for the initial three years (FY2014–FY2016) of the long-term plan. Reflecting sincerely on the accident at the Himeji Plant in 2012, we were determined to implement comprehensive measures to prevent any recurrence of similar accidents and make efforts to foster a safety culture. While ensuring safe and stable production activities and placing greater emphasis on profitability than on sales, the Plan is aimed at reinforcing existing and core businesses, accelerating the launch of new businesses, and expediting commercialization of new products.

FY2017 - FY2020

The second half of the Medium-term Business Plan "Reborn Nippon Shokubai 2020 NEXT"

During the period of the first half of the Plan, the business environment worsened due to intensifying competition for the SAP business, while new businesses were not sufficiently developed. Under these circumstances, we formulated the "Reborn Nippon Shokubai 2020 NEXT" for the second half of the Medium-term Business Plan, renewing our determination to achieve Reborn Nippon Shokubai. The Plan targets three sectors with eight areas for our new businesses, and we are committed to achieving the Plan by redesigning organizational structures mainly in the R&D segment, promoting open innovation, and employing M&As.





Policies for Priority Challenges →P.29

- Strengthen the competitiveness of SAP business
- Accelerate the creation of new businesses and products

Targeting Sustainable Growth →P.35

- Develop and active corporate team and organization
- Strengthen our Group management
- Enhance the confidence of stakeholders

Progress

Strengthen the competitiveness ⇒P.30 of SAP business

- Under the SAP Survival Project, reduced costs throughout the entire supply chain.
- July 2018: New plant in Belgium entered commercial operation.



SAP plant in Belgium

Accelerate the creation of new businesses and products P.31

- Established the Cosmetics Business Office (initially set up in July 2017 as the Cosmetics Business Preparation Office) to develop cosmetics materials that will differentiate us from our competitors and to promote development of application of natural materials to cosmetics materials.
- With the construction of the API'1 synthesis production facility completed, our contract synthesis system for APIs and IND'2s ranging from the mg-scale to the kg-scale was established, aimed at early commercialization.
- New functional monomer AOMA[™] were launched.
 Accelerated commercialization of new
- methylene malonate monomers by combining the synthesis technology of Sirrus, Inc. in the US, which became our subsidiary in 2017, and our process development technology.



*1: Active Pharmaceutical Ingredients *2: Investigational New Drug

Develop and active corporate team and organization ⇒P.36

• Under the Workstyle Innovation Committee (established in FY2017), three working groups (Business Process Re-engineering Team, Workstyle Reforming Team, and IT Solution Team) are implementing innovations.

Policies for Priority Challenges

In the second half of its Medium-term Business Plan "Reborn Nippon Shokubai 2020 NEXT," Nippon Shokubai positions "Strengthen the competitiveness of SAP business" and "Accelerate the creation of new businesses and products" as policies to tackle priority challenges, and we are working on improving our corporate value through business activities that provide people and society with affluence and comfort.

30 Strengthen the competitiveness of SAP business

Superabsorbent polymers (SAP) business leading the world market

31 Accelerate the creation of new businesses and products

"Superior materials" to provide value for people and society

- 31 Developing and launching new products to strengthen existing businesses
- 32 Creating new businesses that will support our future revenue base

Strengthen the competitiveness of SAP business

Superabsorbent polymers (SAP) business leading the world market

Competitive environment surrounding the SAP business

Nippon Shokubai developed and started mass production of superabsorbent polymers (SAP) ahead of other chemical manufacturers in the world. Since then, our SAP business has been leading the world market as a core business along with acrylic acid.

SAP is used mainly as the material of disposable diapers and our SAP business has been supported largely by brisk demand in emerging countries. In recent years, however, the rise of latecomer suppliers in Asia has been intensifying global competition, which is affecting our SAP business to some extent.

Strengthening production system in Belgium

Global demand for SAP is approximately 3.05 million tons (estimate for 2019) at present. In the medium run, we assume an annual increase of 5 to 7%. 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. We also set up a new production facility for acrylic acid. This enabled integrated production from raw materials in Europe, and strengthened 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.





SAP plant in Belgium



Reducing costs through the entire supply chain to enhance competitiveness

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 planning to introduce AI and IoT at the Himeji Plant by fiscal 2020 to improve their production efficiency, and will subsequently introduce them at other plants both inside and outside Japan, thereby enhancing our competitiveness.

"Superior materials " to provide value for people and society

Developing and launching new products to strengthen existing businesses

In the new Energy Materials Business we have commercialized LiFSI (IONEL[™]), which contributes to improving the performance of lithium ion batteries for the first time in the world. We aim to expand demand as electrolytes for batteries installed in electric vehicles (EVs) and plug-in hybrid vehicles (PHEVs). In the electronic information materials business, we became the first in the world to achieve commercial production of acrylic resin for optical films (ACRYVIEWA[™]), which contribute to the development of large liquid crystal displays. Our dispersed zirconia nanoparticles (ZIRCOSTAR[™]) are used as the material to improve the performance of displays on smartphones, etc.

Electrolytes for lithium ion batteries LiFSI (IONEL™)



IONEL[™] is used as the electrolyte in lithium ion batteries and is effective in improving the stability of batteries in high-temperature storage, extending their cycle life, and improving their charge/discharge performance at low temperatures, contributing to the improved performance and durability of LiB across a broad temperature range. Despite the difficulty in synthesis and refining, Nippon Shokubai has commercialized for the first time in the world and has started to supply the product. To be prepared for an increase in demand for lithium ion batteries, we are planning to set up new plants of a scale of several thousand tons.

Acrylic resin for optical films (ACRYVIEWA™)



Commercial production of ACRYVIEWA[™] was started in 2006. ACRYVIEWA[™] became the first acrylic film in the world to be adopted for liquid crystal displays. With high transparency, optical performance and heat resistance, ACRYVIEWA[™] has contributed greatly to the development of high-performance liquid crystal displays (larger and thinner) for televisions, smartphones and tablets. We have expanded our production capacity in phases in response to the expansion of demand in line with the trend toward larger liquid crystal panels for televisions. We now have an annual production capacity of 9,000 tons.

Dispersed zirconia nanoparticles (ZIRCOSTAR™)



ZIRCOSTAR[™] is used as a refractive index adjuster to enhance the brightness and sharpness of flat panel displays. ZIRCOSTAR[™] is highly dispersible in a variety of organic solvents and resins. Resin in which ZIRCOSTAR[™] particles are dispersed can achieve a high optical performance (high refractive index, high transparency). ZIRCOSTAR[™] is used in optical materials for plastic lenses and displays, and for electronic materials.





Profile

Management Strategies Policies for Priority Challenges Targeting Sustainable Growth

Creating new businesses for our future profit base

Nippon Shokubai has set the "launch of new businesses in high-growth potential markets key business driver" as one of the priority challenges for the second half of its medium-term business plan "Reborn Nippon Shokubai 2020 NEXT." As the keystrategy for this challenge, the company selected from various markets and areas three sectors with eight areas after evaluating their market potential, suitability for the company, and social needs. We are working on creating new businesses in these sectors and areas.

We position medical materials, health care and cosmetics as three growth areas in the life sciences business, semi-conductors and imaging as two growth areas in the ICT sector, and mobility, energy conversion and water as three growth areas in the energy and resources business sector, aiming to develop these sectors to become key businesses in the future.

Nippon Shokubai also pays attention to the targets of the Sustainable Development Goals (SDGs) adopted at the United Nations Summit in 2015 as global common social issues, and is working on creating new businesses with a view to contributing to achieving the targets.

The second half of the Medium-term Business Plan "Reborn Nippon Shokubai 2020 NEXT"

 Priority
 Survival of the SAP business

 Challenges

 • Launch of new businesses in high-growth potential markets as our future key driver

Global common social issues

 17 GOALS TO TRANSFORM OUR WORLD							
1 ≌overty Æ¥∰∰ #Ê	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 EDUCATION	5 EQUALITY	6 CLEANWATER AND SANTATION		
7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 ADDISTRY, INNOVATION AND NERASTRUCTURE	10 REDUCED DEQUALITIES	11 SUSTAINABLE CITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION		
13 climate	14 LIFE BELDOW WATER	15 LARE ON LAND	16 PEACE JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS	SUSTAINABLE DEVELOPMENT GOALS		

Select target sectors for new businesses based on market potential, suitability for the company, and social needs.

Life sciences

- Medical materials →P.34
 Healthcare
- Cosmetics \rightarrow P.33
- Semiconductor
 Imaging
 ⇒P.33

ICT

Energy and environment

- Mobility →P.34
- Energy conversion
- Water

"Superior materials" to provide value for people and society

Progress with new business targets in three sectors with eight areas

Life sciences

$\langle \text{Cosmetics area} \rangle$

To provide new value for cosmetics

Basic strategy

We develop materials with functions that are in demand for cosmetics, using our proprietary products and technologies. In addition, we will acquire the natural materials and new compounding techniques that we do not possess through external partnerships. Our value proposition is to provide the customers with story.

Progress of the strategy

Aiming at an early launch of business, we set up the Cosmetics Business Planning Office in 2017 and upgraded it to the Cosmetics Business Office in 2019 in line with progress in development and external partnerships.

In house, the development of polymers that are antibacterial and emulsifiable, polymers capable of simultaneously absorbing/releasing water and other materials (oil, active ingredients, etc.), microparticles that are biodegradable and sebum-absorbing and polymers capable of retaining moisture and improving skin texture, are under way. Through external partnerships with companies that have natural materials, we are developing the application of protein from silkworms to cosmetics materials.



Market and its social background

In the Japanese cosmetics market, demand for high-quality and high-performance products is growing due to the recovery in the economy and brisk inbound demand. In the overseas cosmetics market, meanwhile, trust for the quality of Japanese products has been boosting exports to Asian countries. The market is expected to grow further along with the population increase and the rise in income levels.

 Predicted scale of world cosmetics market in 2022



ICT

 \langle Imaging area \rangle

To build a affluent and comfortable society

Basic strategy and progress

AOMA[™] functional monomers, which we developed by employing our unique molecular design technique, are excellent as a diluent for UV/EB curable materials because of their very low viscosity. Their polymers are hard yet flexible, and have excellent adhesion to various substrates including glass, metals and plastics. Taking advantage of these characteristics, we propose application to various uses, including UV inkjet inks and materials for flexible devices.

Market and its social background

Among photo-sensitive materials, UV inkjet inks and 3D printer resins are expected to grow by 6.5% and 8.4%, respectively,





in the world market. As the shift to UV is accelerating in response to the needs for low-VOC inks and paints due to tightening regulations, the 3D printing is more suitable for design change, small production lot, short delivery time and so on. For these applications, the performance of resins has been constantly improved, and Nippon Shokubai is working on developing materials with improved toughness, heat resistance and adhesion, and monomers with low viscosity.

 Growth rate of photo-sensitive materials in the world market

UV inkjet inks **6.5**%



(Medical materials area / Pharmaceutical) To support middle-molecule drug development

Basic strategy

We aim to provide consistent services from R&D on seeds for middle-molecule drugs to their contracted production.

The term of middle-molecule drugs refers collectively to compounds of a size in the middle of macromolecule drugs, such as proteins and antibodies, and small-molecule drugs produced mainly by chemical synthesis. Oligonucleotide and peptides drugs fall into this category.

Progress of the strategy

API*1 synthesis production facility was completed in January 2019. It is one of the largest production facilities in Japan with a floor area of 3,000m2, equipped with a solid phase synthesizer for oligonucleotide and peptide drugs, large-scale separation and purification apparatus, freeze dryer and other production equipment, and analysis equipment for QC testing. Using this facility, which is compliant with GMPs*2 in Japan, the US and the EU, and the PIC/S Guide*3, we will establish a system for contract synthesis of APIs and IND*4s ranging from Lab or Kilo-Lab scale (mg-g) to production (kg) scale, aiming at early commercialization.

In the areas of oligonucleotide and peptide drugs and DDS*5, Nippon Shokubai has formed business partnerships or capital alliances with GlyTech, Inc., TAK-Circulator Corporation, and Rena Therapeutics Inc., and is working to create new value through these collaborations.



- 1: Active Pharmaceutical Ingredients
- *2: Good Manufacturing Practices, referring to the standards for production management and quality management of pharmaceuticals.
- *3: Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme, referring to an international framework to promote the establishment of GMP and mutual inspections.
- *4: Investigational New Drug
 *5 Drug Delivery System, referring to the technique of controlling chemical transport and release in the human body to enable efficient delivery to the affected part.

Market and its social background

Expectations are growing for middle-molecule drugs, which have the advantages of both small-molecule drugs and macromolecule drugs because of their applicability to a wide range of diseases, availability for chemical synthesis and high specificity. Emerging as a modality for next-generation, middle-molecule drugs are being actively developed both inside and outside Japan, and high growth rates are expected in markets at all stages from drug development research to clinical development, and post-marketing. So, a stable supply of API is critical.

Predicted scale of Predicted scale of world oligonucleotide USD 12,200 million drug market in 2025

USD42,500 million

Survey by BB Bridge)

Predicted scale of world peptide drug market in 2025

Energy and environment

$\langle Mobility area \rangle$

To ensure the sustainable use of energy and resources

Basic strategy and progress

Nippon Shokubai has been developing Methylene Malonate, a new material that is excellent in low temperature-curing and can contribute to saving energy consumption and reducing the environmental load in addition to reducing product weight.

By combining the synthesis technology of Sirrus, Inc. in the US, which became our subsidiary in 2017, and our process development technology, the two companies are cooperating and continue development, aiming at commercialization in 2020.

Market and social background

In response to social demand for mitigating climate change,



including reducing energy consumption and reducing environmental impact, the automotive industry has been working to improve fuel efficiency and promote electrification. In tackling similar tasks, chemical manufacturers are urged to develop new materials that will contribute to reducing VOCs in their production processes and reducing energy consumption, apart from the development of materials that will directly contribute to the improved performance of secondary batteries for electric vehicles (EVs), such as electrolytes for lithium ion batteries LiFSI (IONEL).

Predicted scale of world automotive paint market in 2021



Targeting Sustainable Growth

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.

36 Develop and Active Corporate Team and Organization

36 Workstyle innovation activities

37 Strengthen our Group Management

37 Improving corporate value for the entire Group

38 Enhance the Confidence of Stakeholders

- 38 CSR Concept
- **39** CSR Medium-term Targets and Initiatives, and Results for Fiscal 2018
- 41 Responsible Care (RC) activities
- 42 Environmental Protection Initiatives
- **44** Process Safety and Disaster Prevention Initiatives
- 45 Occupational Safety and Health Initiatives / Chemical Safety Initiatives
- 46 Quality Initiatives /
 - CSR Activities through Purchasing
- 47 Corporate Ethics
- 48 Risk Management
- **49** Our Relationship with our Employees

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, the Workstyle Innovation Committee headed by the President was formed to implement company-wide activities. Under the Workstyle Innovation Committee, three working groups, specifically, the Business Process Re-engineering Team, Workstyle Reforming Team, and IT Solution Team, were set up, and each team is working on various activities 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. An example of these activities is granting overall authority to each department staff to enable them to respond 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 reform of our human resources system and measures to support diverse workstyles so that employees can have a higher motivation for work. An example of these measures is introduction of the in-house recruitment system to raise employee awareness of their participation in their work.

IT Solution Team

This team is proposing new forms of work using IT. Specifically, 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. An example of these activities is introduction of robotic process automation (RPA) to automate work operations.



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.



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 own 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 and sharing R&D information, are used to maximize business synergies.



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 on production, intellectual property, and administration through training sessions or other opportunities, and encourage human resources exchanges within the Group, thereby enhancing the Group synergy. To ensure that the direction in which the Nippon Shokubai Group is heading is shared by all Group employees, we are considering formulating new values and guidelines for ways of thinking and acting that can be understood and shared by all Group employees, while reemphasizing our Group Mission "**TechnoAmenity** – Providing affluence and comfort to people and society, with our unique technology."



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 2018

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.

Stakeholder	Subject		Medium-term Targets & Initiatives
	Corporate Ethics		To continue to emphasize corporate ethics while strengthening our regulatory compliance structure and enhancing various training programs
Company-wide	Risk Man	agement	To endeavor to expand our risk management while regularly analyzing risk, including undertaking a review of our current Business Continuity Plan
Company-wide	Corporate 0	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
Environment	Environmental	Preventing Global Warming	 To reduce energy consumption by an amount equivalent to 8,000 kL of crude oil (over 4 years) To reduce energy intensity by 5% from fiscal 2015 levels by fiscal 2020 To reduce CO2 emissions intensity (by energy origin) by 5% from fiscal 2015 levels by fiscal 2020 To reduce fuel consumption intensity for road transport by 5% from fiscal 2015 levels by fiscal 2020; to promote modal shift
12 SERVICINE ADDRESSON	Protection	Waste	To maintain zero emissions (Quantity of final off-site landfill) \leq (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 quality complaints"
	Chemica	al Safety	To achieve zero problems related to chemical safety (legal or social problems)
	Logistics Safety		To achieve zero accidents and disasters related to logistics
	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.
Community	unity 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
15 ∰ 	Process Safety and Disaster Prevention		To achieve zero severe process safety accidents
	RC Comm	nunication	To promote dialogue on Responsible Care initiatives with local residents and implement appropriate information disclosure
Employees	Human R	esources	To identify and train leaders who can lead the organization; to promote Diversity & Inclusion
4 coulty 5 court 8 contraction	Occupatio	nal Safety	To achieve zero injuries with or without loss of workdays, including contractors
	Occupatio	nal Health	To provide all workers with a supportive and ideal work environment; to promote a healthy work-life balance
Government Collaboration		oration	To continue to cooperate with the administration through industrial associations and other avenues

CSR Medium-term Targets and Initiatives, and Results for Fiscal 2018

Profile Management Strategies

CSR Implementation Structure

We believe that promoting CSR activities and sustainability is implementing the Group Mission " **Techno Amenity** – 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 2018 Results)
Implemented corporate ethics training for general employees, and training on various individual laws and regulations (Anti-monopoly Act, Subcontractors Act, basic knowledge on agreements).
 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. Set specific quantitative standards for the exercise of voting rights by cross shareholding.
Provided security education to familiarize employees with the formulation of basic information security regulations and the revision/abolition of related regulations.
 1) Reduced energy consumption by 2,300 kl. 2) Reduced energy intensity by 4.6% from fiscal 2015 levels. 3) Reduced CO2 intensity by 9.1% from fiscal 2015 levels. 4) Reduced fuel consumption intensity by 2.7% 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 11.0% 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, and achieved 3) zero serious customer complaints.
Registered zero legal or social problems related to chemical safety.
Registered zero accidents during product transportation.
Conducted surveys on green procurement using a new tool (chemSHERPA). Continued formulating the CSR procurement policy.
 Disclosed our corporate governance report in accordance with the revised corporate governance code. Continuously disclosed financial results and other materials. Conducted IR meetings for analysts and institutional investors in May and November and held an IR meeting for individual investors in January.
• Continued to implement forest development initiatives in Japan and China according to the Third-term Five-year Plan. Started a new initiative to develop mangrove forests in Indonesia.
Registered zero severe process safety accidents.
Published the CSR Report.
 Following the company-wide training for division managers in FY2017, implemented training for line managers at the Kawasaki Plant. Also implemented training for manufacturing managers and line managers to strengthen the development of leadership personnel. Continued to identify issues and formulate specific measures for the future based on the results of training for female leaders and their supervisors implemented in FY2017 as a measure to promote women's participation and advancement in the workplace.
Target not reached: Registered three injuries with loss of workdays and 14 injuries with no 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 and human health and safety in all processes ranging from the development of chemical substances to their manufacture, distribution, 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 (JRCC; currently known as the Japan Chemical Industry Association Responsible Care Committee) since it was established in 1995, and has been advancing various initiatives.



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 disasters 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.



Policies for Priority Challenges Targeting Sustainable Growth

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

Products that contribute to the environment

Chemical products have an impact on the environment because they are produced using the Earth's resources and involve the discharge of CO_2 and other waste. However, looking at the entire product lifecycle from resource 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.

Environmental considerations	Reasons	Applications	Specific Products	
Energy conservation Conserve energy and CO ₂ reduction when using products		Solid oxide fuel cell materials Lithium-ion battery materials Automotive damping materials UV-curable reactive diluents Resist agents Optical electronic materials Particulates for light diffusion	Electrolyte sheets for solid oxide fuel cells IONEL TM ACRYSET TM VEEA TM ACRYCURE TM , EPOCEL TM ZIRCOSTAR TM EPOSTAR TM	
Waste reduction	Reduce waste with high durability	Concrete additives	AQUALOC™, AQUAGUARD™	
Chemical emission reduction	Suppress emissions of volatile organic compounds	Water-based paints	ACRYSET™, EPOCROS™	
Air and water pollution prevention	Suppress emissions of HCs (hydrocarbons), NOx, dioxin and other pollutants Process wastewater	Removal of HCs (hydrocarbon), NOx, dioxin and other pollutants from exhaust gas Oxidation and decomposition of harmful substances in wastewater Water treatment additives (flocculants)	Automotive catalysts, Waste gas treatment catalysts, Denitrification catalysts and equipment Dioxin decomposition catalysts and equipment Wastewater treatment catalysts for catalytic wet air oxidation EPOMIN TM	
Water resource conservation Effective water resource utilization	Reduce water use	Hollow fibers Liquid detergent builders	Polyvinyl pyrrolidone AQUALIC™L	
Biodiversity conservation	Biodegradability (decays quickly in the environment)	Detergent ingredients	SOFTANOL [™] , HIDS™	

Promoting CO₂ 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 CO₂ emissions.

The c-LCA method assesses CO₂ emissions throughout the lifecycle of a finished 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.

AQUAGUARD™	Calculation of CO_2 emissions avoided in one year when all apartments are built as long-lasting structures	3.4 million tons
ACRYSET™	Calculation of CO ₂ emissions avoided when an application-type vibration-damping material is installed in all automobiles manufactured in one year	310,000 tons
ZIRCOSTAR™	Calculation of CO_2 emissions avoided when ZIRCOSTAR is incorporated in all smartphones manufactured in one year	220,000 tons
VEEA™	Calculation of expected CO_2 emissions avoided from the use of all the UV curable inks produced in one year	330,000 tons

For details, please refer to RC Report 2019.

Targeting Sustainable Growth

Initiatives for Tackling Climate Change

Promoting CO₂ emissions reductions

As the world stepped into a new phase in tackling global warming after the Paris Agreement was adopted in 2015, the Japanese government established a Plan for Global Warming Countermeasures. This plan positions the Commitment to a Low Carbon Society established by the Japan Business Federation (Keidanren) as the base for action by businesses.

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.

In fiscal 2018, the results of our efforts to conserve energy aimed at our fiscal 2020 targets were 104 l/t for energy intensity and 0.199 t/t for energy source CO_2 emission intensity.



Trends in Energy Consumption and Intensity

Energy consumption (crude oil equivalent)

Nippon Shokubai
 Group companies in Japan
 Group companies outside Japan
 Energy intensity (Nippon Shokubai)
 (L/t-production)
 (L/t-production)



* The amount of energy consumed and CO₂ emissions do not include our head offices, research centers, plant administrative buildings or employee welfare facilities. The amount of energy consumed and CO₂ emissions in faced 2018 totaled 8,000 kiloitters and 16,000 tons respectively for the head offices, research centers, plant administrative buildings, and employee welfare facilities of Nipons Phokubai.

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

- *1: 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.
- *2: 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_2 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 CO₂ emissions, we are advancing initiatives to reduce our CO₂ 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 minimized idling and the installation of energy-efficient tires.

Pollution Control Initiatives Targeting Air and Water

We are monitoring our SOx, NOx and dust emissions, and we have installed denitrification equipment that we developed inhouse for NOx and dust scrubbers to prevent air pollution. For SOx, 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. By continuing with our zero emissions initiative (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 2018, 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 production processes to minimize byproducts, reusing those 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 2018, we released 96 tons of substances subject to the PRTR^{*2} Law, which represents a 11.0% decrease in emissions compared to fiscal 2015 levels.

We remain focused on further reducing emissions toward our fiscal 2020 target of a 25% reduction from fiscal 2015 levels.

Policies for Priority Challenges Targeting Sustainable Growth

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 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)>
- Assure safety based on our Corporate Credo, "Safety takes priority over production."
- <Behavior principles during production activities>
- 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^{*1} and Class B^{*2} severe process safety accidents.

Efforts to prevent accidents and malfunctions

We employ HAZOP 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.

- *1: Level 9 or higher according to the Nippon Shokubai method on the Japan Petrochemical Indus try Association chart
- *2: 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 2018, they verified the safety management activities at both plants.

The Executive Officer of the Responsible Care Division at 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 Ukishima 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 highpressure gas production facilities and autonomous safety inspections by companies with competent self-managed safety systems. Accreditation for our Ukishima Plant was renewed in February 2019.

*3: 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, "hyari hatto" near miss and "55" 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 to reduce or eliminate the sources of risks. Moreover, we are systematically implementing risk assessments for chemicals handled at each workplace and working to decrease risks.

Occurrence of industrial injuries

In fiscal 2018, we experienced two injuries with loss of workdays and eight injuries with no loss of workdays. Our contractors experienced one injury with loss of workdays and six injuries with no loss of workdays.

In recent years, industrial injuries have occurred at a high rate among younger workers at our company and our contractors, so we are enhancing safety education and hands-on training for inexperienced young workers to raise their safety awareness.

Trends in Frequency of Injuries with Loss of Workdays



*1: Industrial injuries per million working hours *2: 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"

Profile

Targeting Sustainable Growth

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 quality issues that arise and share information throughout the company by compiling it into a database to visualize the progress of the response. At the same time, we are preventing quality issues from occurring through company-wide distribution of case studies.



Quality control convention

Strengthening the audit system

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, we continue to strengthen quality audits at all our plants and Group companies inside and outside Japan to improve quality management in the Nippon Shokubai Group.

In fiscal 2018, executive management conducted RC inspections on the theme "preventing quality troubles and ensuring quality governance."

The inspections confirmed that at both the Himeji and Kawasaki Plants, past problems have been thoroughly reviewed and communicated throughout the company, that the quality system incorporates an adequate mechanism for preventing falsification or fabrication, and that the quality awareness is shared among the employees to ensure qualityrelated governance at the plants.

They also confirmed that the quality assurance systems at our plants and Group companies inside and outside Japan are in compliance with the Guidelines for strengthening the Quality Assurance System*, which were released by the Japan Petrochemical Industry Association in response to recent inadequate quality incidents that had occurred at some member companies.

* Japan Petrochemical Industry Association formulated these Guidelines in June 2018 to ensure quality governance.

CSR Activities through Purchasing

We are promoting CSR procurement to minimize the impacts on the environment throughout the supply chain in cooperation with our customers and suppliers.

CSR procurement initiatives

We put our Group Mission into practice throughout the supply chain for our products. To provide safe and reliable products, we procure raw materials based on our TechnoAmenity Promotion Rules and Responsible Care Promotion Rules in cooperation with our suppliers and business partners.

We are now preparing a CSR Procurement Policy to establish CSR procurement through the whole supply chain.

To fulfill our social responsibilities, we continue to confirm that we do not procure so-called conflict minerals.^{*1} We continuously monitor the actual situations at our suppliers, and stop procurement promptly if the use of conflict minerals is discovered.

*1: 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 CAHRA (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.

We have switched from MSDSplus/AIS information transmission sheets, which was the conventional scheme, to chemSHERPA*², which was developed under the guidance of the Ministry of Economy, Trade and Industry.

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

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

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 2017 and fiscal 2018, we conducted a total of 74 corporate ethics training courses for rank-and-file employees with over 1,700 people participating.

In these training courses, we shared the importance of "not doing things that you know to be wrong" because thoughtless words and actions by just one person can have a negative impact on their workplace colleagues and even the company as a whole. Moreover, in addition to "not doing things that you know to be wrong" individually, which is to be expected, we also emphasized "doing what you think is right (for other people, the workplace and the company)" since "pretending not to see" troublesome behavior by colleagues amounts to not nipping more serious future problems in the bud. In addition, participants also learn that the actions of each individual contribute to preventing corporate scandals and cultivating a healthy corporate culture.



Rank-based training

Awareness initiatives in the workplace

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

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. Profile

Management Strategies Policies for Priority Challenges Targeting Sustainable Growth

Governance

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	Large						
pability	Small	Low (priority 9)	Low (priority 🕖)	Medium (priority @)					
ncy / Prot	Medium	Low (priority ③)	Medium (priority 9)	High (priority 2)					
Freque	Large	Medium (priority @)	High (priority 3)	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 genderneutral 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 and conducted a workshop with them as well as giving management training for their superiors. Based on the results of these workshop and training, we are advancing new initiatives to further support 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.

Re-employment system

This system corresponds to measures that address the rescheduling of the pension eligibility age and is intended to help stabilize the lives of retired employees. The period of re-employment extends until the age of 65. This initiative contributes to an employee's sense of security, self-worth, job satisfaction and motivation, as it provides ongoing employment in a familiar work environment.

Note: Re-employment rate of retired employees (non-consolidated): 85.7% (fiscal 2018)

Employment of people with disabilities

We are committed to employing people with disabilities and giving them active roles at each of our workplaces and at our designated Group subsidiary, NS Green Co., Ltd.

Promoting work-life balance

Providing balanced assistance for work, child care and nursing care

Japan's low birth rate and aging population remain pressing issues, and it is essential that all sectors of society continue to support child care and nursing care. Private enterprises are also required to create an environment that supports a balance between work, child care and nursing care. We are responding to these social realities by working to create an environment and infrastructure that provides a variety of systems to support employees with their parenting and nursing responsibilities while employed. We have also published a guidebook that summarizes our balanced support system, and we continue to keep our employees broadly informed and educated.

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 excessive working 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 work to reduce them. Émployees who have worked for long hours are encouraged to attend an interview with an industrial physician or receive a health check using a medical questionnaire. 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 are thus working to create a working environment friendly to employees by paying attention to their work-life balance.



Providing Balanced Assistance for Work and Child Care

Notes: Number of employees using child care leave of absence: 24 (Total number of employees for fiscal 2017) Number of employees using reduced working hours system for child care: 242 (Total number of employees for fiscal 2017)

Profile

Human capital development

Human resources management system

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

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.

Framework of the Human Resources System for Managerial Employees



Structure for human resources development

We have listed the following four items as "personnel objectives" to cultivate leaders who take the initiative and assume responsibility for a task without leaving it to others to perform.

Self-starters capable of taking the initiative in identifying and resolving issues
 Personnel capable of flexibly adapting themselves and their organizations
 Personnel capable of demonstrating experience and expertise
 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. In 2018, we gave training to manufacturing managers and line managers. We are planning programs to develop human resources capable of innovating and holding dialogue meetings for section managers.

To support efforts to encourage employees to be independent thinkers, we provide opportunities that include self-directed training and distance learning in addition to "rank-based training" that employees participate in at each step of their careers, and support their studies.

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. Under these circumstances, we have organized a program to

Under these circumstances, we have organized a program to dispatch young employees to our overseas affiliates as trainees for short periods of time. Starting from fiscal 2015, we use foreign trainers to provide training for employees who are likely to be seconded overseas to give them various multicultural skills.



Others

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.

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.



Physical strength measurement

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.



Management (as of June 20, 2019)



Yujiro Goto President and Representative Member of the Board



Masao Yamamoto

Representative Member of the Board, Senior Managing Executive Officer Administration, HR, Finance, Accounting, Information Technology IT Management Office ERP Innovation Project



Koichiro Yamada Member of the Board, Managing Executive Officer Sales, Marketing, Purchasing, Logistics Ethylene Oxide Business Division Business Development & Marketing



Jiro Iriguchi Member of the Board, Managing Executive Officer Production & Technology Production Division Engineering Division Indonesia Project Al Promotion Team



Yojiro Takahashi

Member of the Board, Senior Managing Executive Officer Innovation & Business Development Health & Medical Business Development Office Malonates Business Development Office Cosmetics Business Office



Yukihiro Matsumoto Member of the Board, Executive Officer Director of Corporate Planning Division



Kozo Arao Member of the Board (External)

Statutory Corporate Auditors

Yoshihiro Arita Teruhisa Wada Yoichiro Komatsu (External) Yoritomo Wada (External)



Shinji Hasebe Member of the Board (External)

Managing Executive Officers

Kin-ya Nagasuna Masaya Yoshida Teruo Kamei Ren Hasebe



Tetsuo Setoguchi Member of the Board (External)

Executive Officers

Kazukiyo Arakawa Gun Saito Katsunori Kajii Masahiro Watanabe Kazuhiro Noda Takashi Kobayashi Kuniaki Takagi Profile

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 April 2019)

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 nine 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

Focusing on CSR as a crucial element in corporate management, this council promotes CSR activities. It 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 2018

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 issues and risks in business execution, the results of business execution, and the internal control system" have been well implemented.

Initiatives planned for the future

With a view to further increasing the effectiveness of Board Meeting, we will make continuous efforts in response to the results of the evaluation, which showed that improved explanations of the important strategies and issues of our Group companies, business environment and strategies in new product fields, and dialogue with shareholders and investors were needed.

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 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. 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. Profile

Management Strategies Policies for Priority Challenges Targeting Sustainable Growth

Governance

Reasons for nomination and principal activities of Members of the Board and Statutory Corporate Auditors

(as of June 20, 2019)

	Name	Reasons for election	Independent Member	Attendance at Board Meetings/Auditors Meetings during FY2018
	Yujiro Goto	He has played a key role in our management as Representative Member of the Board and has success in executing mid- to long-term business plans. We believe that he will make appropriate decisions on our management and provide supervision based on his achievements.		13/13 Board Meetings
	Masao Yamamoto	He has been involved with the planning, administration and finance divisions for a long time and has successes in reforming the personnel system and strengthening the corporate governance system and financial standing, etc. We believe that he will make appropriate decisions on our management and provide supervision based on his achievements.		13/13 Board Meetings
Members of	Yojiro Takahashi	He has been involved with the corporate planning and sales & marketing divisions for a long time and has successes in creating new businesses and promoting open innovation, etc. We believe that he will make appropriate decisions on our management and provide supervision based on his achievements.		13/13 Board Meetings
the Board	Koichiro Yamada	He has been involved with the sales & marketing divisions and overseas services for a long time and has successes in strengthening the sales foundation and executing the growth strategy of each business, etc. We believe that he will make appropriate decisions on our management and provide supervision based on his achievements.		10/10 Board Meetings (following his election on June 2018)
	Jiro Iriguchi	He has been involved with the production and technology divisions for a long time and has successes in stably operating manufacturing sites and smoothly managing subsidiaries, etc. We believe that he will make appropriate decisions on our management and provide supervision based on his achievements.		10/10 Board Meetings (following his election on June 2018)
	Yukihiro Matsumoto	He has been involved with the production and technology divisions and overseas services for a long time and has successes in launching manufacturing sites in Japan and overseas and promoting responsible care, etc. We believe that he will make appropriate decisions on our management and provide supervision based on his achievements.		13/13 Board Meetings
	Kozo Arao	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 highly professional expertise and wealth of experience as an attorney-at-law and achievements as an External Officer of other companies, in addition to his past achievements as as an External Statutory Corporate Auditor and Outside Member of the Board.	0	13/13 Board Meetings
Outside Members of the Board	Shinji Hasebe	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.	0	10/10 Board Meetings (following his election on June 2018)
	Tetsuo Setoguchi	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 for a company with high public utility properties, in addition to his past achievements as an Outside Member of the Board.	0	10/10 Board Meetings (following his election on June 2018)
Statutory Corporate	Yoshihiro Arita	We believe that he will contribute valuable opinions at Board Meetings and properly audit the legality of management decisions, etc. based on his wealth of experience in corporate planning, responsible care and finance & accounting divisions, in addition to his past achievements as a Statutory Corporate Auditor.		13/13 Board Meetings 13/13 Auditors Meetings
Auditors	Teruhisa Wada	We believe that he will contribute valuable opinions to Board Meetings and properly audit the legality of management decisions, etc., based on his wealth of experience in the general administration & personnel division.		Appointed in June 2019
External Statutory Corporate	Yoichiro Komatsu	We believe that he will contribute valuable opinions to Board Meetings and properly audit the legality of management decisions, etc. from an objective position, based on his highly professional expertise and wealth of experience as an attorney-at-law and patent attorney, and achievements as External Statutory Corporate Auditor for other companies, in addition to his past achievements as as an External Statutory Corporate Auditor.	0	13/13 Board Meetings 13/13 Auditors Meetings
Auditors	Yoritomo Wada	We believe that he will contribute valuable opinions to Board Meetings and properly audit the legality of management decisions, etc., from an objective position, based on his highly professional expertise and wealth of experience as a certified public accountant.	0	Appointed in June 2019

11-Year Consolidated Financial Data

Japanese GAAP	2008	2009	2010	2011	2012	2013	
For the fiscal year							
Net sales	289,102	244,317	288,345	320,704	269,520	302,136	
Gross profit	38,211	48,251	66,549	68,341	44,619	48,955	
Operating profit	622	13,881	29,813	31,100	10,034	13,752	
Ordinary profit	757	14,934	30,955	33,114	13,824	16,647	
Profit attributable to owners of parent	- 5,307	10,832	21,119	21,257	8,401	10,503	
Cash flows from operating activities	17,613	44,346	31,706	43,857	27,322	16,992	
Cash flows from investing activities	- 16,675	- 23,850	- 16,696	- 21,747	- 31,878	- 25,141	
Cash flows from financing activities	8,099	- 21,772	- 3,050	- 9,671	81	- 2,519	
Depreciation	17,958	16,234	15,619	16,767	15,402	16,995	
Capital investments	19,539	21,038	14,403	23,684	29,137	25,067	
R&D expenses	12,082	10,753	11,246	11,938	11,441	11,161	
As of the end of the fiscal year							
Total assets ^{*1}	302,948	310,946	329,332	356,407	352,373	398,396	
Net assets	151,662	163,781	194,266	209,070	220,248	242,193	
Interest-bearing debt	100,659	81,781	64,278	59,507	64,872	68,553	
Per share information							
Profit attributable to owners of parent per share (Yen) $^{^{\rm '2}}$	- 29.61	60.85	110.30	104.71	41.38	51.74	
Net assets per share (Yen) ^{*2}	831.11	898.33	938.67	1,006.48	1,059.85	1,164.10	
Dividends (Yen) ^{*2}	15.50	14.00	22.00	22.00	16.00	16.00	
Payout ratio	_	23.0%	19.9%	21.0%	38.7%	30.9%	
Management index							
Shareholders' equity ratio ^{*1}	48.8%	51.4%	57.9%	57.3%	61.1%	59.3%	
ROA (Ratio of ordinary profit to total assets) $^{^{\prime 3}}$	0.2%	4.9%	9.7%	9.7%	3.9%	4.4%	
ROE (Ratio of profit to shareholders' equity) ^{'4}	- 3.3%	7.0%	12.1%	10.8%	4.0%	4.7%	
Overseas sales ratio	43.3%	46.9%	46.9%	45.3%	46.5%	47.3%	

*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).

Policies for Priority Challenges Targeting Sustainable Growth

(Unit: Millions of yen)

			(Unit: Millions of yen)
2014	2015	2016	2017
374,873	323,124	293,970	322,801
65,738	70,001	60,471	66,137
26,133	31,234	21,151	26,727
29,941	34,342	24,664	32,293
19,089	26,003	19,361	24,280
32,697	53,264	37,474	38,823
- 18,941	- 12,963	- 44,515	- 27,498
- 10,237	- 20,012	- 3,533	- 9,762
18,971	17,875	17,957	16,997
12,346	15,156	37,289	25,827
11,948	12,303	13,283	13,266
419,634	407,997	433,610	467,386
270,128	282,485	292,275	310,762
66,842	50,680	58,040	58,064
470.28	640.69	478.36	608.84
6,535.66	6,870.84	7,238.33	7,705.05
120.00	150.00	150.00	160.00
25.5%	23.4%	31.4%	26.3%
63.2%	68.3%	66.6%	65.7%
7.3%	8.3%	5.9%	7.2%
7.6%	9.6%	6.8%	8.1%
51.3%	49.8%	49.0%	48.0%

IFRS	2017	2018
For the fiscal year		
Revenue	313,939	338,869
Gross profit	67,544	66,577
Operating profit	25,610	26,170
Profit before income tax	29,805	32,119
Profit attributable to owners of parent	22,641	23,849
Cash flows from operating activities	44,206	35,918
Cash flows from investing activities	- 31,563	- 31,316
Cash flows from financing activities	- 10,601	- 9,982
Depreciation and amortization	22,918	25,626
Capital investments	30,355	29,919
R&D expenses	14,251	13,996
As of the end of the fiscal year		
Total assets	480,316	481,668
Total equity	316,188	329,227
Interest-bearing debt	58,474	56,633
Per share information		
Basic earnings per share (Yen)	567.71	598.05
Equity attributable to owners of parent per share (Yen)	7,750.24	8,099.97
Dividends (Yen)	160.00	170.00
Payout ratio	28.2%	28.4%
Management index		
Rate of equity attributable to owners of parent	64.3%	67.1%
ROA (Ratio of profit before income tax to total assets) ⁵	6.4%	6.7%
ROE (Ratio of profit to equity attributable to owners of parent) ⁷⁶	7.6%	7.5%
Overseas sales ratio	52.8%	53.8%



Overview of Business Results for FY 2018 (April 1, 2018 to March 31, 2019)

Looking at the global economic situation for FY 2018, the economy continued to recover in the United States and also recovered moderately in Europe. Meanwhile, economic recovery appeared to be stalling in China, and signs of weakness were seen in some emerging countries in Asia. Furthermore, the outlook for the global economy remained unclear because of uncertainties, including the impact of trade friction between the U.S. and China and the crude oil market trend.

The Japanese economy continued to recover moderately, supported by an increase in capital investment and steady improvement in the employment situation.

In the chemicals industry, although demand remained robust, the outlook for raw material prices was unclear.

Overview

Under these circumstances, the Group's consolidated revenue increased 24,930 million yen (7.9%) year-on-year to 338,869 million yen in FY 2018. Contributing factors included a revision of sales prices following a rise in raw material prices and overseas market prices.

Operating profit grew 561 million yen (2.2%) year-on-year to 26,170 million yen due to the effects of scale merits from rising production and sales volumes, mainly in the functional chemicals segment, despite higher processing costs.

Profit before income tax rose 2,314 million yen (7.8%) yearon-year to 32,119 million yen because of an increase in operating profit and share of profit of investments accounted for using equity method.

As a result, profit attributable to owners of parent increased 1,209 million yen (5.3%) year-on-year to 23,849 million yen.

Furthermore, the profit before income tax to revenue ratio remained at the same level as in FY 2017 due to an increase in processing costs despite a rise in revenue from the revision of sales prices. In addition, the asset turnover ratio improved because total assets increased slightly thanks to a reduction in cash and cash equivalents and a fall in financial assets, etc., despite a rise in trade receivables and inventories, etc. Consequently, ROA (Ratio of profit before income tax to total assets) grew 0.3 points from 6.4% to 6.7%.

Overview of Business Results by Segment

Revenue and operating profit by segment



Basic chemicals business

Sales of acrylic acids and acrylates grew due to a hike in selling prices following a rise in raw material prices and overseas market prices, despite a decline in sales volume.

Sales of ethylene oxide increased due to a revision of sales prices that reflected higher raw material costs and a rise in sales volume.

Sales of ethylene glycol decreased because of a decline in sales volume.

Sales of ethanolamine fell thanks to a drop in sales volume, despite a hike in selling prices accompanying higher raw material prices.

Sales of secondary alcohol ethoxylates grew due to a rise in sales volume and a hike in sales prices following higher raw material prices.

Consequently, revenue in the basic chemicals segment increased 6.2% year-on-year to 139,210 million yen.

Operating profit decreased 21.0% year-on-year to 10,709 million yen. This was mainly due to an increase in processing costs and selling, general and administrative expenses, despite widening of the spread between sales prices and raw material prices (sales prices increased more than raw material prices).

Functional chemicals business

Sales of superabsorbent polymers increased due to a hike in selling prices following a rise in raw material prices and a growth in sales volume.

Sales of polymers for concrete admixture, water-soluble polymers for raw materials for detergents, resins for paints, adhesive products, and electronic information materials grew thanks to a growth in sales volume.

Sales of specialty acrylates decreased because of a decline in sales volume, despite a revision of sales prices that reflected a rise in raw material costs and overseas market prices.

Sales of maleic anhydride and resin modifiers fell due to a decrease in sales volume.

Policies for Priority Challenges Targeting Sustainable Growth

Sales of ethyleneimine derivatives and iodine compounds increased due to a change in the product mix, despite lower sales volume.

As a result, revenue in the functional chemicals segment rose 9.4% year-on-year to $189{,}642$ million yen.

Operating profit increased 16.2% year-on-year to 13,394 million yen. This was due to a rise in production and sales volumes and a fall in selling, general and administrative expenses, despite an increase in processing costs.

Environment & catalysts business

Sales of automotive catalysts decreased due to a decline in sales volume.

Sales of fuel cell materials diminished because of a fall in sales prices, despite an increase in sales volume.

Sales of process catalysts, wet oxidation catalysts, and materials for lithium-ion batteries grew thanks to a rise in sales volume.

Sales of De-NOx catalysts and waste gas treatment catalysts declined due to a fall in sales volume.

Consequently, revenue in the environment & catalysts segment rose 4.6% year-on-year to 10,017 million yen.

Operating profit in the segment increased 697 million yen year-on-year to 916 million yen due to an increase in sales volume and a decrease in selling, general and administrative expenses.

Overview of Financial Position for FY 2018

Total assets at the end of FY 2018 increased 1,352 million yen from the end of FY 2017 to 481,668 million yen. Current assets decreased 791 million yen compared to the end of FY 2017. This was due to a fall in cash and cash equivalents, although trade receivables grew due to the Company's efforts to maintain sales prices, which had been revised following a rise in raw material prices till the third quarter of FY 2018, despite a significant decline in raw material costs in the fourth quarter of FY 2018. Non-current assets rose 2,143 million yen from the end of FY 2017. This was due to an increase in property, plant and equipment as a result of capital investment, although financial assets decreased because of a decline in their market values.

Total liabilities decreased 11,687 million yen compared to the end of FY 2017 to 152,441 million yen. This was due to a fall in trade payables as a result of lower raw material costs and repayments of borrowings.

Total equity grew 13,039 million yen from the end of FY 2017 to 329,227 million yen. This was due to a rise in retained earnings, despite a decrease in other components of equity.

Rate of equity attributable to owners of parent rose 2.8 points, from 64.3% at the end of FY 2017 to 67.1%. Equity attributable to owners of parent per share increased 349.73 yen compared to the end of FY 2017 to 8,099.97 yen.

Overview of Cash Flows for FY 2018

Cash and cash equivalents at the end of FY 2018 amounted to 47,434 million yen, a decrease of 5,202 million yen from the end of FY 2017, since the total of 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 FY 2018 amounted to 35,918 million yen (44,206 million yen was provided in FY 2017). Trade payables at the end of FY 2018 decreased. This was due to a settlement of the FY 2017's unsettled portion during FY 2018, which was delayed because the end of FY 2017 fell on a bank holiday, and due to a significant decline in raw material costs in the fourth quarter of FY 2018, which had been on the rise from FY 2017. Trade receivables increased primarily due to efforts to maintain sales prices, while income taxes paid also increased, which led to decreased inflows of 8,288 million yen compared to FY 2017.

Cash flow from investing activities

Net cash used in investing activities in FY 2018 totaled 31,316 million yen (31,563 million yen was used in FY 2017). Outflows decreased for the purchase of property, plant and equipment, which led to decreased outflows of 246 million yen compared to FY 2017.

Cash flow from financing activities

Net cash used in financing activities in FY 2018 amounted to 9,982 million yen (10,601 million yen was used in FY 2017). Despite an increase in purchase of investments in subsidiaries not resulting in change in scope of consolidation and dividends paid, repayments of long-term borrowings decreased, which led to decreased outflows of 619 million yen compared to FY 2017.

Consolidated Statement of Financial Position

		(Unit: Millions of yen)		
	March 31, 2018	March 31, 2019		
Assets				
Current assets:				
Cash and cash equivalents	¥ 52,635	¥ 47,434		
Trade receivables	79,338	81,158		
Inventories	56,388	59,266		
Other financial assets	9,300	8,945		
Other current assets	4,701	4,768		
Total current assets	202,362	201,571		
Non-current assets:				
Property, plant and equipment	187,906	193,632		
Goodwill	4,406	4,360		
Intangible assets	9,763	9,200		
Investments in associates and joint ventures accounted for using equity method	20,232	21,773		
Other financial assets	44,332	38,296		
Net defined benefit assets	6,160	8,149		
Deferred tax assets	2,926	2,736		
Other non-current assets	2,228	1,951		
Total non-current assets	277,954	280,097		
Total assets	¥ 480,316	¥ 481,668		

		(Unit: Millions of yen)
	March 31, 2018	March 31, 2019
Liabilities and equity		
Liabilities		
Current liabilities:		
Trade payables	¥ 58,811	¥ 51,866
Bonds and borrowings	12,683	20,851
Income taxes payable	5,583	3,850
Provisions	4,802	5,178
Other financial liabilities	7,920	7,818
Other current liabilities	4,714	4,464
Total current liabilities	94,513	94,028
Non-current liabilities:		
Bonds and borrowings	45,302	34,902
Other financial liabilities	1,157	1,501
Net defined benefit liability	14,282	14,119
Provisions	1,925	1,896
Deferred tax liabilities	6,948	5,995
Total non-current liabilities	69,614	58,413
Total liabilities	164,128	152,441
Equity:		
Share capital	25,038	25,038
Capital surplus	22,400	22,472
Treasury shares	-6,263	-6,274
Retained earnings	258,117	276,934
Other components of equity	9,780	4,838
Total equity attributable to owners of parent	309,073	323,008
Non-controlling interests	7,115	6,219
Total equity	316,188	329,227
Total liabilities and equity	¥ 480,316	¥ 481,668

Profile	Management Strategies	Policies for Priority Challenges	Targeting Sustainable Growth	Governance	Reference Da
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Consolidated Statement of Income and Consolidated Statement of Comprehensive Income

Consolidated Statement of Income			(Unit:	Millions of yen)
	γ	ears ended Marcl	n 31,	
	2018		2019	
Revenue	¥	313,939	¥	338,869
Cost of sales		246,395		272,292
Gross profit		67,544		66,577
Selling, general and administrative expenses		41,835		40,923
Other operating income		2,170		2,193
Other operating expenses		2,269		1,677
Operating profit		25,610		26,170
Finance income		1,420		1,771
Finance expenses		904		923
Share of profit of investments accounted for using equity method		3,680		5,101
Profit before income tax		29,805		32,119
Income tax expense		6,638		7,767
Profit	¥	23,167	¥	24,352
Profit attributable to:				
Owners of parent		22,641		23,849
Non-controlling interests		527		503
Profit	¥	23,167	¥	24,352
Earnings per share:				
Basic earnings per share (Yen)		567.71		598.05
Diluted earnings per share (Yen)				
Consolidated Statement of Comprehensive Income			(Unit:	Millions of yen)

	Years ended March 31,				
	2018		2019		
Profit	¥	23,167	¥	24,352	
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		2,922		-4,102	
Remeasurements of defined benefit plans		-972		1,593	
Share of other comprehensive income (loss) of associates and joint ventures accounted for using equity method		27		-63	
Subtotal of items that will not be reclassified to profit or loss		1,977		-2,572	
Items that may be reclassified to profit or loss:					
Exchange differences on translation of foreign operations		628		85	
Net changes in fair value of cash flow hedges		-3		-3	
Share of other comprehensive income (loss) of associates and joint ventures accounted for using equity method		1,159		-992	
Subtotal of items that may be reclassified to profit or loss		1,784		-910	
Total other comprehensive income (loss)		3,761		-3,482	
Comprehensive income	¥	26,928	¥	20,870	
Comprehensive income attributable to					
Owners of parent		26,294		20,455	
Non-controlling interests		634		415	
Comprehensive income	¥	26,928	¥	20,870	

Consolidated Statement of Changes in Equity

FY2017(April 1, 2017 to March 31, 2018)

"Y2017(April 1, 2017 to March 31, 2018) (Unit: Millions of yen)											
									Othe	er compor	nents of equity
	Share c	apital	Capital	surplus	Treasury	shares	Retained	earnings	Net changes ir assets meas fair value throu comprehensive (l	n financial sured at ugh other oss) income	Remeasurements of defined benefit plans
Balance as of April 1, 2017	¥	25,038	¥	22,396	¥	-6,249	¥	242,059	¥	5,520	¥ —
Profit		—				_		22,641		-	_
Other comprehensive income		—		_		_		_		2,921	-968
Comprehensive (loss) income:		—		_		_		22,641		2,921	-968
Acquisition of treasury shares		_		_		-14		_		_	_
Disposal of treasury shares		_		0		0		_		_	
Cash dividends		_		_		_		-5,982		_	
Increase (decrease) in non-controlling interests		_		4		_		_		_	_
Transfer from other components of equity to retained earnings		_		_		_		-600		-369	968
Total transactions with owners		_		4		-14		-6,582		-369	968
Balance as of March 31, 2018	¥	25,038	¥	22,400	¥	-6,263	¥	258,117	¥	8,072	¥ —

(Unit: Millions of yen)

		her components (Tatal a suite								
	Net changes in value of cash f hedges	i fair Iow	Exchange differe on translation foreign operation	onces of ons	Tota	l	attributable to owners of parent		Non-controlling interests		Total equity	
Balance as of April 1, 2017	¥	6	¥	—	¥	5,526	¥	288,770	¥	7,052	¥	295,822
Profit		_		_		_		22,641		527		23,167
Other comprehensive income		-3	1	1,705		3,654		3,654		107		3,761
Comprehensive (loss) income:		-3	1	1,705		3,654		26,294		634		26,928
Acquisition of treasury shares		_		_		_		-14		_		-14
Disposal of treasury shares		_		_		_		0		_		0
Cash dividends		_		_		_		-5,982		-564		-6,546
Increase (decrease) in non-controlling interests		_		_		_		4		-7		-3
Transfer from other components of equity to retained earnings		_		_		600		_		_		_
Total transactions with owners				—		600		-5,992		-571		-6,563
Balance as of March 31, 2018	¥	3	¥	1,705	¥	9,780	¥	309,073	¥	7,115	¥	316,188

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

FY2018(April 1, 2018 to March 31, 2019) (Unit										(Unit: Millions of yen)	
							Othe	r compor	nents of equity		
	Share c	apital	Capital s	surplus	Treasury shares Retained earnings Net changes in financial assets measured at fair value through other comprehensive (loss) incom		- Retained earnings		financial ured at gh other oss) 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		_		_	_
Disposal of treasury shares		_		_		_		_		_	- –
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							al aquitu				
	Net changes value of cash hedges	in fair n flow	Exchange dir on transla foreign ope	fferences tion of erations	Tota	1	attributable to owners of parent		attributable to owners of parent		Total equity	
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
Disposal of treasury shares		_		_		—		_		_		_
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

Profile	Management Strategies	Policies for Priority Challenges	Targeting Sustainable Growth	Governance	Reference Data
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Consolidated Statement of Cash Flows

		(Unit: Millions of yen)
	Years ended Marcl	n 31,
	2018	2019
Cash flows from operating activities:		
Profit before income tax	¥ 29,805	¥ 32,119
Depreciation and amortization	22,918	25,626
Decrease (increase) in net defined benefit asset	-50	32
Increase in net defined benefit liability	1,234	110
Interest and dividend income	-1,411	-1,769
Interest expenses	431	582
Share of profits of associates and joint ventures accounted for using equity method	-3,680	-5,101
Increase in trade receivables	-13,049	-1,653
Increase in inventories	-3,622	-2,933
Increase (decrease) in trade payables	13,814	-6,928
Other	2,388	1,212
Subtotal	48,777	41,298
Interest and dividends received	2,577	4,378
Interest paid	-445	-584
Income taxes paid	-6,704	-9,175
Net cash flows provided by operating activities	44,206	35,918
Cash flows from investing activities:		
Purchase of property, plant and equipment	-32,750	-32,432
Proceeds from sale of property, plant and equipment	59	225
Purchase of intangible assets	-242	-243
Purchase of investments	-4,807	-4,944
Proceeds from sale and redemption of investments	5,223	4,937
Other	954	1,140
Net cash flows used in investing activities	-31,563	-31,316
Cash flows from financing activities:		
Net decrease in short-term borrowings	-1,905	-518
Proceeds from long-term borrowings	8,787	3,043
Repayments of long-term borrowings	-10,829	-4,556
Acquisition of treasury shares	-14	-12
Dividends paid	-5,982	-6,580
Dividends paid to non-controlling interests	-564	-355
Purchase of investments in subsidiaries not resulting in change in scope of consolidation	-3	-884
Other	-92	-121
Net cash flows used in financing activities	-10,601	-9,982
Effect of exchange rate changes on cash and cash equivalents	471	179
Net increase (decrease) in cash and cash equivalents	2,513	-5,202
Cash and cash equivalents at the beginning of the year	50,122	52,635
Cash and cash equivalents at the end of the year	¥ 52,635	¥ 47,434





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

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Our company logo represents the spirit of **TechnoAmenity** Hexagon Cosmo yellow Earth green

two colors

One of the fundamental symbols used in chemistry Represents the hidden energy of the sun

Represents the life-supporting nature of the earth

Horizon between Represents the future we always seek