

# Denka Report 2018

Integrated Report

Denka Company Limited  
[www.denka.co.jp/eng/](http://www.denka.co.jp/eng/)



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## CONTENTS

## Taking Action to Achieve Our Mission

Denka's Corporate Philosophy and Value Creation Process	P3
A Message from the Chairman	P4
Trajectory of Denka's Growth	P5
Denka's Latest Products and Solutions	P7

## Our Strategies for Securing Sustained Growth

A Message from the President	P9
Special Feature 1: Dialogue—What Denka Must Do to Create New Value over the Medium to Long Term	P13

## Denka's Approach to ESG-Oriented Management

CSR Management	P15
<b>E</b> Initiatives to Preserve and Protect the Environment	P17
<b>E</b> Special Feature 2: Denka's Hydroelectric Power Plants	P19
<b>S</b> Human Resource Development	P21
<b>S</b> Prioritization of Safety	P23
<b>S</b> Social Contribution Activities	P25
<b>G</b> Corporate Governance	P27
<b>G</b> Directors and Audit & Supervisory Board Members	P31

## "Denka Value-Up" Management Plan

Outline of the "Denka Value-Up" Management Plan (fiscal 2018 - 2022)	P33
Business Portfolio Shift	P35
Introduction of Innovative Processes	P37
Business Strategies	P39
Special Feature 3: Dialogue between Staff in Charge of Life Science	P50
Resource Allocations	P53

## Corporate Information

Company Overview/Stock Information/Global Network	P54
Consolidated Financial Statements (Summary)	P55

## Editorial Policy

The Denka Report 2018 printed brochure is the first integrated report issued by Denka Company Limited. The issuance of this report is intended to provide our stakeholders, including shareholders and investors, with a robust communication tool that focuses on conveying what we have been doing to create new value over the medium to long term from the viewpoint of addressing environmental, social and governance (ESG) issues.

Along with the aforementioned printed brochure, we have also compiled the Denka Report 2018 PDF edition, an expanded version encompassing various updates on typical CSR-related topics and Denka's environmental performance. We have also decided to update the status of CSR activities undertaken by individual business sites by creating dedicated pages on our corporate website (<http://www.denka.co.jp/eng/sustainability/>) in place of the former Site Reports. This move is aimed at enhancing the quantity and quality of relevant information being communicated to our stakeholders.

## Coverage

Fiscal 2017 (April 1 2017 through March 31, 2018) in principle; this report includes additional information on some initiatives undertaken subsequent to the fiscal 2017 year-end while presenting data on numerical targets for and

performance statistics from the past several fiscal years.  
Date of publication: November 8, 2018

## Scope

In general, this report encompasses topics on the Denka Group's business sites within the scope of consolidation. However, some articles are based on data gleaned outside the scope of consolidation. These articles individually specify the organizations subject to reporting.

## Guidelines

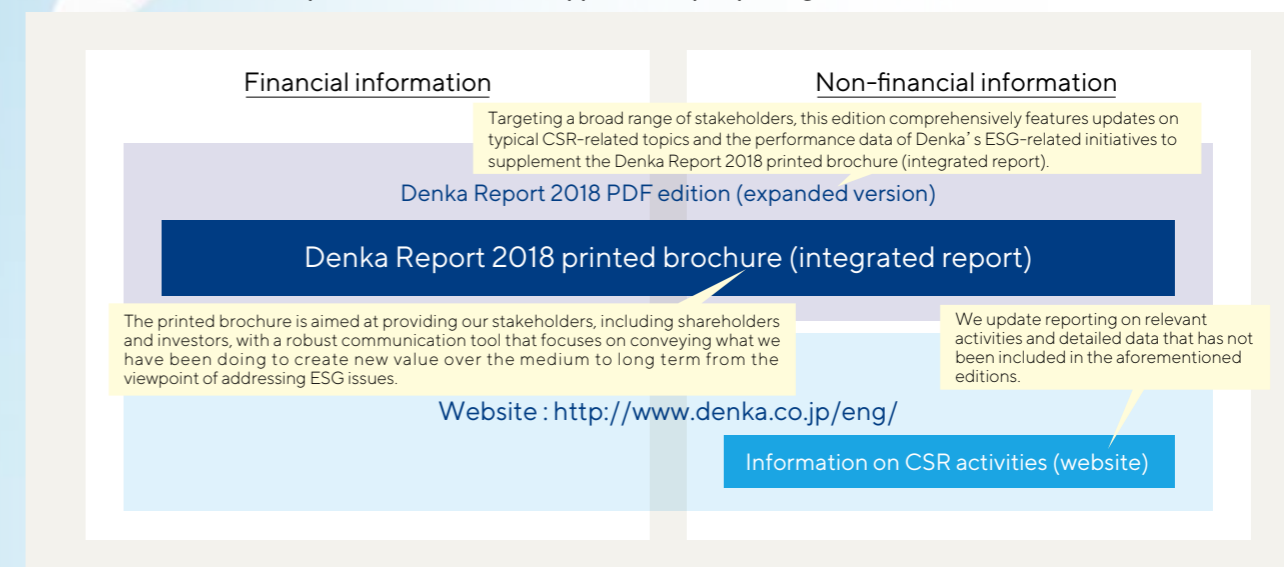
- The GRI Standards of the Global Reporting Initiative (GRI)
- The Environmental Reporting Guidelines 2012 of Japan's Ministry of the Environment
- The International Integrated Reporting Framework of the International Integrated Reporting Council (IIRC)

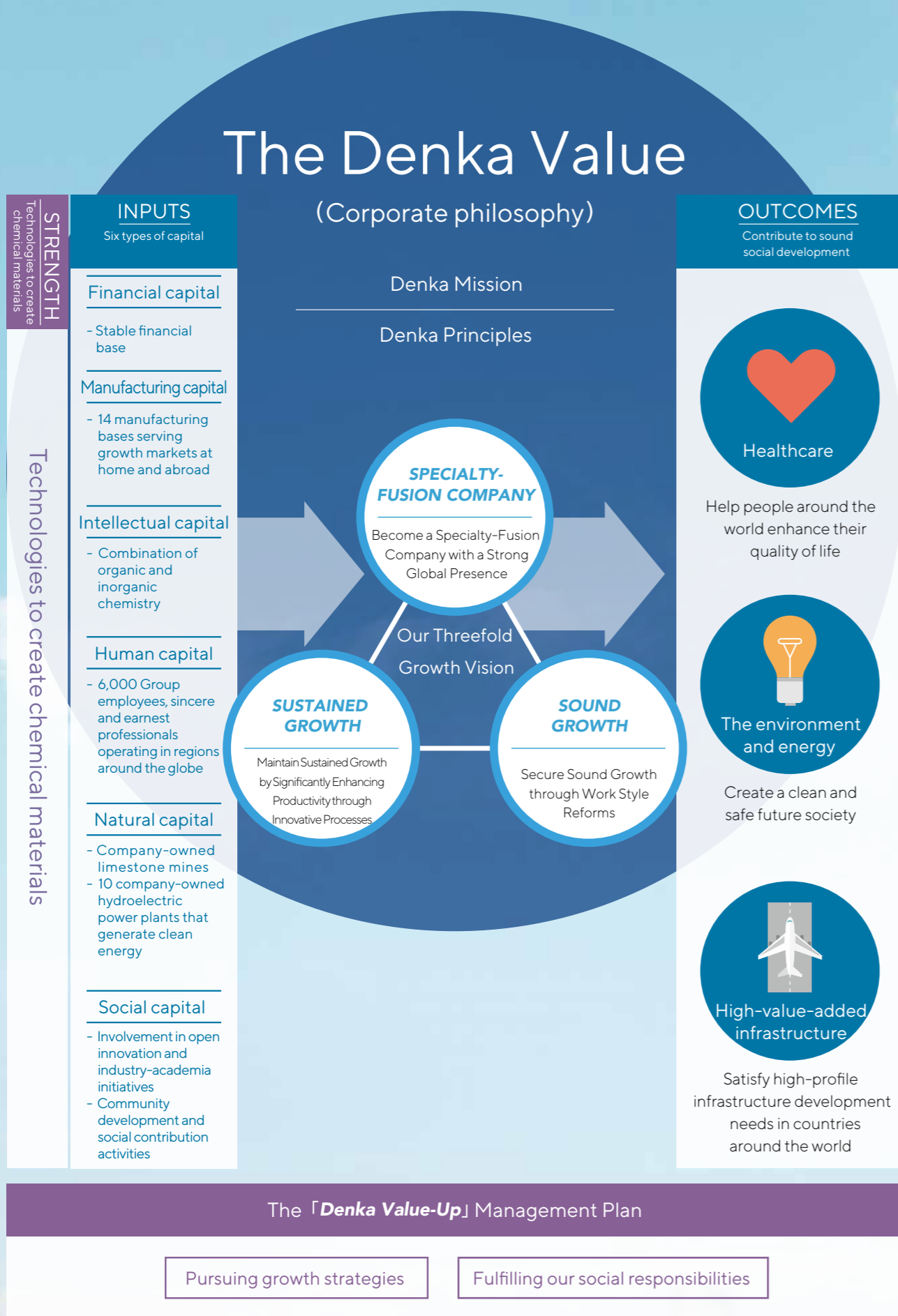
Note: The GRI Content Index is posted on the CSR Section of Denka's corporate website.

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## Overview of the Denka Report 2018 and Other Supplementary Reporting Tools





## The Denka Value, a Corporate Philosophy Reflected in Denka's Future-Thinking Business Approach

Marking the celebration of its centennial in 2015, Denka established The Denka Value, a new corporate philosophy that serves as the foundation for all of its business activities. I have always believed that the ultimate goal of a corporation must be something nobler than the pursuit of numerical targets and performance. No corporate citizen is exempt from its social responsibilities, responsibilities related to environmental preservation and the well-being of the communities in which it operates. Fulfilling these responsibilities is as essential as accomplishing robust corporate performance. A corporation's business and social missions are equally important and are inextricably linked. The Denka Value, our new corporate philosophy, is designed to encapsulate the thoughts described above.

Guided by this philosophy, we are striving to always be sincere in our dealings while decisively taking on the challenges that come our way in the course of business activities. At the same time, we constantly strive to understand the stakeholder perspective in order to secure the soundness and transparency of our corporate management.



**Shinsuke Yoshitaka**  
Representative Director, Chairman  
Denka Company Limited

### The Denka Mission

“Taking on the challenge of expanding the possibilities of chemistry to create new value and contribute to sound social development.”

For 100 years, the Denka Group has been in the vanguard of the chemical industry's development while simultaneously expanding its network into regions around the world. Throughout the course of its history, Denka has maintained a corporate culture that encourages the pursuit of challenging goals. Such pursuit is our *raison d'être*. Denka believes that its corporate activities centered on manufacturing must help facilitate the sound development of society. The Denka Mission has thus been identified to summarize these long-cherished concepts that underlie our manufacturing operations, which can be traced back to Dr. Tsuneichi Fujiyama, one of Denka's founders (see also page 5) and have been passed down by successive predecessors to the present generation. Over the passage of time, we may shift the area of our focus or grow into a significantly larger company. However, our commitment to creating new value via manufacturing will remain unchanged. That is why we recognize a future-thinking business approach as Denka's core value.

We will thus remain courageous as we seek to tap into new business fields while steadfastly focusing on enhancing our strengths in our area of specialty.

### The Denka Principles

To ensure that a sense of purposefulness toward the betterment of society is shared throughout our organization, we have established the Denka Principles, a set of precepts aimed at guiding the actions of all Denka Group employees to fulfill our corporate responsibilities.

We also intend to foster a corporate culture that encourages employees to think freely and act autonomously rather than wait for instructions from management or supervisors. Furthermore, we embrace a bottom-up approach and work to proactively incorporate employee suggestions. To that end, a card bearing the Denka Principles is issued to all employees.

Looking ahead, the Denka Group will strive to live up to the trust and expectations of all of its stakeholders via the pursuit of ongoing initiatives aimed at realizing The Denka Value.

**We:**

- Boldly confront challenges with determination and sincerity.
- Think and take action today with the future in mind.
- Deliver new values, and inspire customers through innovative *monozukuri*.\*
- Respect the environment and create a cheerful workplace that prioritizes safety.
- Contribute to a better society, whilst taking pride in being a trusted corporate citizen.

\* Japanese-style craftsmanship

# Trajectory of Denka's Growth

—Taking on the Challenge of Expanding the Possibilities of Chemistry for More than a Century

Ever since its founding, Denka has created a wealth of products via the application of calcium carbide production technologies and pursued the ultimate in *Monozukuri* (Japanese-style craftsmanship) while changing its output in response to the needs of the times.

Dr. Tsuneichi Fujiyama, the pioneer of the carbide industry in Japan

In 1902, Dr. Fujiyama became the first in Japan to successfully manufacture calcium carbide, at a plant in Sankyozawa, outside the city of Sendai. This was only about ten years after the world's first trial production of calcium carbide by a Canadian chemist. He was also the first to introduce technology for the manufacture of calcium cyanamide (nitrogenous limestone) from calcium carbide into Japan. He developed a steady stream of creative new technologies, and opened the Hokkai Carbide Plant in the city of Tomakomai, Hokkaido, in 1912. His achievements had a tremendous influence on the subsequent growth of Japan's chemical industry.



Made an entry into the pharmaceutical field  
Having acquired shares in Toshiba Kagaku Kogyo, which was established in 1950 as the Research Institute for Biology, Physics and Chemistry, the Company made an entry into pharmaceutical-related fields, including vaccines and diagnostic reagents. In 1982, Toshiba Kagaku Kogyo was rebranded Denka Seiken Co., Ltd.

Application of high-temperature control technologies as well as findings from nitride research

Made an entry into the fine ceramics field  
The Company initiated the production and sale of boron nitrate (BN) by applying the sintering technology it had accumulated through calcium carbide and calcium cyanamide manufacturing. The Company also developed various fine ceramics materials thereafter.

Technological pursuit to enhance functionalities of concrete

Launched the manufacture of calcium carbide and calcium cyanamide

In 1915, Denki Kagaku Kogyo Kabushiki Kaisha (now Denka Company Limited) was established as the successor to the Hokkai Carbide Plant. It started off producing calcium carbide and a calcium cyanamide fertilizer derived from calcium carbide, with hydroelectric power plants providing the production facilities with electricity to sinter limestone and coke.

Entered the field of acetylene chemistry  
The Company entered the acetylene chemicals field via the application of proprietary technologies that produce acetylene from calcium carbide. After the release of acetylene black in 1942, the Company succeeded in commercializing such products as acetic acid, vinyl acetate and vinyl chloride.

### Three Specialty Businesses

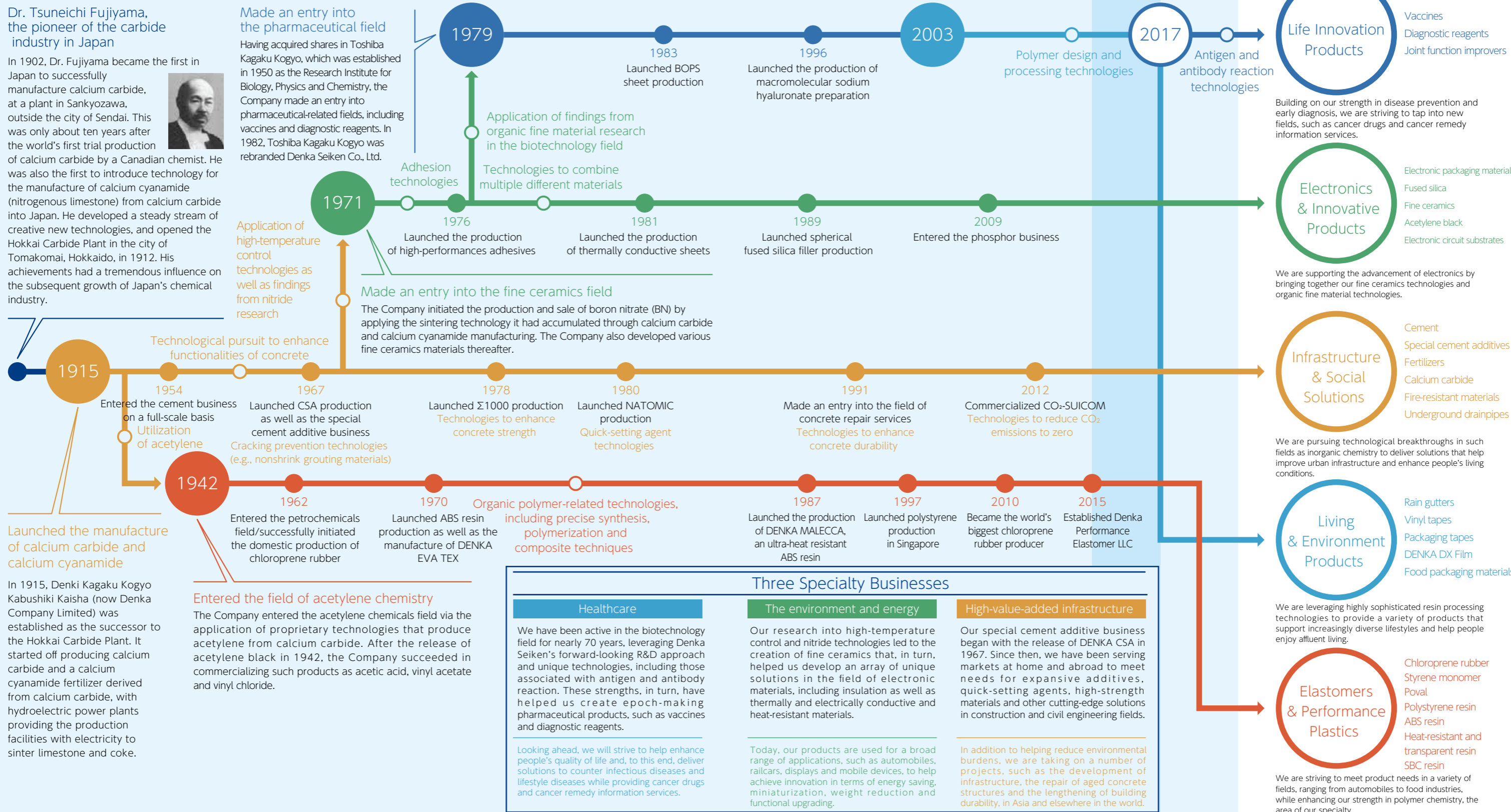
Healthcare	The environment and energy	High-value-added infrastructure
<p>We have been active in the biotechnology field for nearly 70 years, leveraging Denka Seiken's forward-looking R&amp;D approach and unique technologies, including those associated with antigen and antibody reaction. These strengths, in turn, have helped us create epoch-making pharmaceutical products, such as vaccines and diagnostic reagents.</p> <p>Looking ahead, we will strive to help enhance people's quality of life and, to this end, deliver solutions to counter infectious diseases and lifestyle diseases while providing cancer drugs and cancer remedy information services.</p>	<p>Our research into high-temperature control and nitride technologies led to the creation of fine ceramics that, in turn, helped us develop an array of unique solutions in the field of electronic materials, including insulation as well as thermally and electrically conductive and heat-resistant materials.</p> <p>Today, our products are used for a broad range of applications, such as automobiles, railcars, displays and mobile devices, to help achieve innovation in terms of energy saving, miniaturization, weight reduction and functional upgrading.</p>	<p>Our special cement additive business began with the release of DENKA CSA in 1967. Since then, we have been serving markets at home and abroad to meet needs for expansive additives, quick-setting agents, high-strength materials and other cutting-edge solutions in construction and civil engineering fields.</p> <p>In addition to helping reduce environmental burdens, we are taking on a number of projects, such as the development of infrastructure, the repair of aged concrete structures and the lengthening of building durability, in Asia and elsewhere in the world.</p>

1915-1944	Initial Period Launched the calcium cyanamide business	1945-1974	Period of Expanding Core Businesses Entered the field of acetylene chemistry	1975-2006	Period of Expanding Specialty Businesses Created a series of leading-edge products via the combination of organic and inorganic chemistry	2007-2017	Denka100 Developed a robust foundation for the next 100 years while focusing management resources on growth fields	2018-	Denka Value-Up To become a specialty-fusion company
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## Launched the Living & Environment Products Business

Having absorbed TOYO KAGAKU Co., Ltd., which was established in 1949, the Company has introduced a lineup of unique products designed to help enhance people's well-being and preserve the global environment.

2015  
Centennial of Denka's founding  
Rebranded to "Denka Company Limited"



### Life Innovation Products

Vaccines  
Diagnostic reagents  
Joint function improvers

Building on our strength in disease prevention and early diagnosis, we are striving to tap into new fields, such as cancer drugs and cancer remedy information services.

### Electronics & Innovative Products

Electronic packaging materials  
Fused silica  
Fine ceramics  
Acetylene black  
Electronic circuit substrates

We are supporting the advancement of electronics by bringing together our fine ceramics technologies and organic fine material technologies.

### Infrastructure & Social Solutions

Cement  
Special cement additives  
Fertilizers  
Calcium carbide  
Fire-resistant materials  
Underground drainpipes

We are pursuing technological breakthroughs in such fields as inorganic chemistry to deliver solutions that help improve urban infrastructure and enhance people's living conditions.

### Living & Environment Products

Rain gutters  
Vinyl tapes  
Packaging tapes  
DENKA DX Film  
Food packaging materials

We are leveraging highly sophisticated resin processing technologies to provide a variety of products that support increasingly diverse lifestyles and help people enjoy affluent living.

### Elastomers & Performance Plastics

Chloroprene rubber  
Styrene monomer  
Poval  
Polystyrene resin  
ABS resin  
Heat-resistant and transparent resin  
SBC resin

We are striving to meet product needs in a variety of fields, ranging from automobiles to food industries, while enhancing our strength in polymer chemistry, the area of our specialty.

# Denka's Latest Products and Solutions

Our products are used in various ways to support day-to-day living while contributing to the sound development of society.

Parentheses indicate relevant business segment.

## Healthcare (Life Innovation Products)



### Medical inspection and healthcare institutions

- Virological diagnostic reagents
- Lifestyle disease diagnostic reagents
- Reagents for measuring sd LDL-C to determine heart disease risk



### Hospitals and clinics

- Influenza HA vaccines
- Joint function improvers (Macromolecular sodium hyaluronate preparation)

## High-Value-Added Infrastructure (Infrastructure & Social Solutions)



### Concrete and other structures

- DENKA PRETASCON nonshrink grouting materials
- The Denka Rising Method used for the repair of steel-reinforced concrete
- TEFKA fluorine-based films for membrane structure construction



### Buildings and condominiums

- CO<sub>2</sub>-SUICOM eco-friendly concrete
- EIEN prolonging the lives of concrete buildings

## The Environment and Energy (Electronics & Innovative Products, etc.)

### Lithium ion secondary batteries

- Ultra-pure acetylene black
- Rubber hoses, belts and air suspension systems
- Synthetic rubber (chloroprene rubber and DENKA ER)
- Speakers and motors
- HARDLOC structural adhesives
- Synthetic rubber



### LED lights and televisions

- DENKA HITPLATE thermally conductive insulated metal substrates
- Thermally conductive sheets
- Phosphors



### Airport runways

- SUQCEM ultrahigh-strength fiber-reinforced concrete



### Tunnels

- DENKA NATMIC quick-setting agent for shotcrete
- HARDLOC II adhesive used for the repair of concrete cracking

### Hydroelectric power plant conduits

- DENKA Σ80N ultrahigh-strength concrete



## Other Key Operations



### PCs and smartphones

- Semiconductor encapsulant fillers
- Thermally conductive sheets and spacers
- Dicing tapes and electronic packaging materials



### Railcars

- DENKA AN and SN Plates ceramics substrates for invertors
- DENKA ALSINK aluminum and MMC compound materials



### Elastomers

- Styrene monomer
- Polymer processing products (rain gutters and industrial tapes)
- Cement
- Calcium carbide-related products
- Fertilizers

The above featured exemplars of Denka's lineup provide a glimpse of the variety of its products and their breadth of application.

# A Message from the President



Pursuing “**Denka Value-Up**,” a Management Plan Aimed at Creating a Specialty-Fusion Company

**Manabu Yamamoto**  
Representative Director,  
President & CEO  
Denka Company Limited

In April 2018, Denka launched “Denka Value-Up,” a new management plan spanning a five-year period. This plan is intended to help us acquire outstanding competitiveness in the global market and enhance our resilience to changes in the operating environment. Through the implementation of this plan, we also aim to become an even stronger company backed by a robust portfolio of specialty businesses\* and products along with technological strengths and human resource capabilities. In these ways, we will realize The Denka Value, our corporate philosophy.

Here, I will review the outcomes of Denka100, our previous management plan, while also providing an outline of the new management plan.

\* Denka’s definition of a specialty business: A business that meets or has the potential to meet the following conditions in the near future: 1) boasting distinctive strengths and product value; 2) possessing resilience to changes in external factors; and 3) commanding an industry-leading market share

## 1. Review of the Outcomes of Denka100

### 1 Major accomplishments

We have assiduously engaged in initiatives centered on three growth strategies designed to “Create the most optimal production system”; “Scrutinize every cost element”; and “Focus management resources on new growth drivers and develop next-generation products.”

To create the most optimal production system, we have expanded our network of overseas production and R&D bases while increasing the number of overseas production items. This move was also intended to aid us in securing greater market share outside Japan. Thanks to these efforts, we were able to raise the ratio of overseas sales to net sales. We also strove to scrutinize every cost element, an effort that allowed us to achieve our fiscal 2017 cost reduction target of ¥100 billion well ahead of schedule in 2016. Having focused our management resources on new growth drivers and the development of next-generation products, we have succeeded in increasing operating income from

our operations in growth fields, namely, healthcare, the environment and energy, and infrastructure, from ¥12.9 billion in fiscal 2013 to ¥16.7 billion in fiscal 2017. Today, operating income from these operations accounts for around half of Denka’s consolidated operating income.

As a result, the Company’s EBITDA over the course of five years from fiscal 2013 to 2017 topped ¥250 billion. This represents an increase of approximately ¥50 billion compared with EBITDA in the preceding five years, attesting to the success of our efforts to improve cash-generating capabilities.

### 2 Challenges that must be addressed going forward

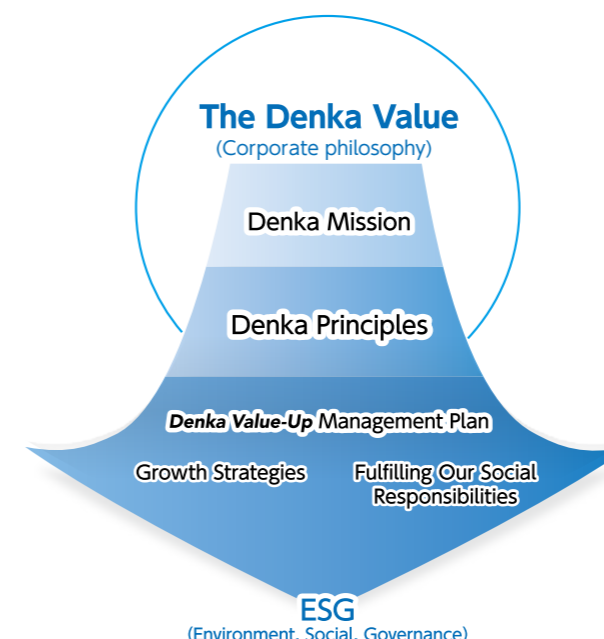
Although Denka has been steadily expanding its operations in growth fields, the pace of expansion is still lagging behind expectations. Moreover, the profitability of our key operations is vulnerable to external conditions. Accordingly, we need to enhance the value of these operations via specialization and the provision of even more sophisticated solutions.

In addition, Denka has much to do to enhance its operational productivity. We are therefore aware of the importance of process reforms. Moreover, we must push

ahead with work style reforms to improve the well-being of employees, our most important stakeholder group. To this end, we will endeavor to help each strike an optimal work-life balance while promoting diversity.

## 2. Outline of Denka Value-Up

To address these issues, in April 2018 we launched “Denka Value-Up,” a new management plan that aims to help us become a “Specialty-Fusion Company” backed by a robust portfolio of businesses and products along with technological strengths and human resource capabilities.



### 1 Our Threefold Growth Vision

We have established a new growth vision that takes over our previous strategies under the Denka100 management plan.

First, this vision specifies a “Specialty-Fusion Company” as our foremost ideal, reflecting our belief that the pursuit of specialization is an essential condition for the survival.



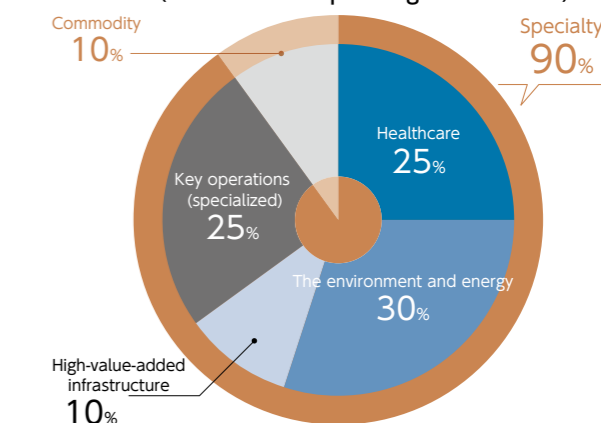
Of course, we also know that needs reflect the times and are always evolving. Accordingly, we must stay ahead of trends and deliver a constant stream of new specialty products, rather than rely on a fixed portfolio of products that only temporarily meet needs. To this end, we are determined to engage in ongoing efforts to create new technologies via open

innovation and M&A while incorporating cutting-edge facilities. Above all, we are acutely aware of the importance of human resource development. We will pursue the specialization of businesses, products, technologies and human resources. Under the Denka Value-Up management plan, we aim to raise the ratio of specialty businesses to 90% of our entire business portfolio by the end of fiscal 2022 (based on the operating income ratio).

Second, we will strive to enhance our capabilities to achieve “Sustained Growth.” This requires the enhancement of productivity via the introduction of innovative processes. Therefore, we will carry out process reforms in every aspect of our operations ranging from R&D, production to sales and administrative operations.

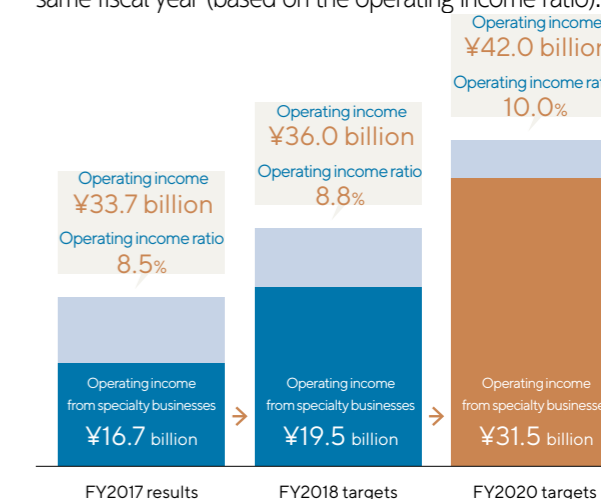
Third, we will endeavor to realize “Sound Growth.” We will focus on securing corporate growth in harmony with stakeholder interests, believing that the pursuit of stakeholder happiness is a prerequisite for the survival of the Company.

Our fiscal 2022 target for the ratio of specialty businesses (based on the operating income ratio)



### 2 Denka Value-Up Numerical Targets

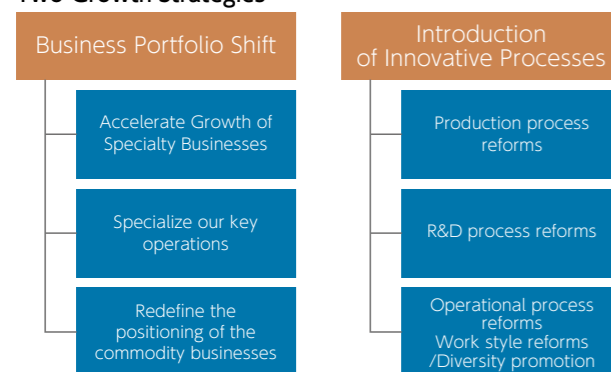
In line with this management plan, we have identified numerical targets for the three years from fiscal 2018 through 2020. Specifically, we aim to achieve consolidated operating income of ¥42 billion and an operating income ratio of 10% or more in fiscal 2020 while raising the ratio to sales of specialty businesses to 75% or more in the same fiscal year (based on the operating income ratio).



### 3 Our Growth Strategies

In line with the Denka Value-Up management plan, we are pursuing two growth strategies.

## Two Growth Strategies



## A Business Portfolio Shift

Under the Denka Value-Up management plan, we are striving to transform our business portfolio and accelerate the specialization of our operations. To this end, we focus our management resources on three fields with significant growth potential.

## Healthcare

We have positioned healthcare as one of the priority fields that bolster our specialty businesses. With the aim of helping enhance people's quality of life, we are striving to create and deliver solutions associated with disease prevention, early diagnosis, cancer remedies and genome-based medication. In 2017, we established the Life Innovation Division to oversee healthcare-related operations across the Group. We have also engaged in external collaborations and M&As in such areas as vaccines and diagnostic reagents. Moreover, efforts are now under way to expand into new business fields, including cancer treatment.

Denka Seiken Co., Ltd., a core Group subsidiary backed by a solid track record spanning nearly 70 years, provides influenza vaccines, a variety of diagnostic reagents and other healthcare-related products. Denka Seiken maintains one of Japan's largest privately-funded libraries of infectious bacteria and viruses. In the area of diagnostic reagents, the subsidiary has developed a reagent to measure sdLDL-C, which is used as a marker to diagnose the potential of developing critical diseases. Via its partner company in China, Denka Seiken has secured approval for the production and sale of this reagent from the Beijing Food and Drug Administration. The subsidiary also acquired 510k clearance for this reagent from the U.S. Food and Drug Administration. To meet burgeoning demand in the area of heart disease, we will accelerate the implementation of our marketing strategies targeting regions around the globe.

In the area of cancer treatment, we established Denka-KEW Genomics LLC, a cancer remedy information service provider leveraging gene alteration analysis technologies, in 2017. Furthermore, we are looking to secure a contract manufacturer agreement for G47Δ oncolytic virus. In terms of R&D, we focus on such themes as norovirus vaccine development that utilizes magniCON, a technological platform created by Icon Genetics GmbH, while undertaking research into diagnostic reagents for detecting tropical infectious diseases, including dengue fever and Zika fever, at Denka Life Innovation Research Private Limited, a key life science research base in Singapore.

## The environment and energy

In the priority environment and energy field, we are striving to help realize a clean and safe future society and to this end are focusing on developing new solutions for the automotive industry. Currently, the Automotive Materials & Solutions Department is spearheading R&D initiatives being undertaken throughout the organization to create materials and solutions that will meet emerging needs for zero-emission vehicles and autonomous driving systems. In this way, we aim to remain at the vanguard of medium- to long-term trends in the automotive industry.

For example, our ultra-high purity carbon black is widely used as a cathode conductive agent for lithium ion secondary batteries (LiBs). We are engaged in an ongoing effort to create carbon black with even higher purity while enhancing our technologies to control particle diameters. Also, we command the world's leading market share of silicon nitride. This ceramic material is increasingly sought after for use in power modules due to its superior thermal conductivity and strength. Leveraging our sophisticated nitride, molding and calcining technologies, we are striving to enhance the reliability of our products while differentiating them from competitors in terms of performance. Applying a cluster strategy, Denka is assiduously introducing a number of products with competitiveness and potential in such promising fields as automobiles.

## The specialization of key operations

The specialization of key operations is essential to raising the ratio of specialty businesses

Chloroprene rubber accounts for less than 1% of the overall annual production volume of rubber materials including natural rubber available on the market. Although chloroprene rubber is grouped with offerings supporting our key operations, this product differs from other rubber materials suited for general purpose uses as it also has particular suitability for specific applications. In 2015, we acquired operations from the U.S.-based DuPont related to Neoprene, that company's chloroprene rubber. Thanks to this move, we were able to secure a chloroprene rubber production facility operating in the United States that utilizes manufacturing methods different from those employed by the Omi Plant (Niigata Prefecture), another key chloroprene rubber production facility. By coordinating the operations of these two facilities, we have optimized our production and sales structure while enhancing resilience against fluctuations in such external factors as raw material prices and foreign exchange rates. We are also proactively developing specialty-grade chloroprene rubber products in addition to releasing a novel elastomer (Evolmer) with superior functions and other new offerings, to increase the number of high-value-added items on offer and promote the specialization of our elastomer business as a whole.

Also, our SBC, MS and IP\* have higher value among other products based on polystyrene and other synthetic resins, which are typically positioned as commodities. These products boast unique features that are suited for highly specialized fields, including light guiding substrates for displays and heat-resistance improvers for resins. Focusing on these fields, we will expand our lineup of highly functional products, thereby specializing our operations.

We are restructuring commodity businesses that are intrinsically unsuitable for specialization among key operations

In line with the Denka Value-Up management plan, we have redefined the positioning of our two commodity businesses, namely, the calcium carbide chain and styrene chain.

As for the calcium carbide chain, we have decided to terminate calcium carbide production at the Omuta Plant (Fukuoka Prefecture) and consolidated calcium carbide production at the Omi Plant with the aim of securing a more efficient, streamlined production structure with higher profitability. We will also consolidate the production of acetylene black, a derivative of calcium carbide, at the Chiba Plant (Chiba Prefecture) and Denka Singapore Pte. Ltd.

With regard to our styrene chain, thoroughgoing cost reduction efforts are now under way, for example, we are working in tandem with Maruzen Petrochemical Co., Ltd. to optimize steam supply and other utilities. We have also downsized our ABS resin production facilities while reviewing the sales portfolio for this product. This, in turn, has helped us improve profitability.

To create new businesses, we will utilize our technological assets backed by a track record spanning a century while leveraging a robust pool of human resources

Over the course of a long history extending more than 100 years, Denka has accumulated a variety of technologies in addition to developing a robust pool of human resources. Thanks to this, our special cement additive business, for example, is positioned to utilize our robust cement sales network while benefitting from raw material calcining technologies that have been accumulated via kiln operations and used to produce a broad range of cement-related products. Moreover, our involvement in the cement business has helped us reinforce our human resource base. We are aware of the need to better utilize our assets, including the technologies and human resources that support each business. We believe that doing so is essential to creating new businesses that serve future generations.

## B Introduction of Innovative Processes

Achieving production process reforms while realizing higher product quality

To enhance productivity, we will introduce automation and robotics technologies at all of our production facilities and streamline our production processes. In particular, our plans call for promoting the utilization of AI and IoT by designating model production sites. We will then roll out best practices proven at these sites to other facilities. Currently, initiatives to create a "smart factory" are under way at our resin plant in Singapore under the auspices of the Singaporean government. These initiatives include big data analysis employing operational data from steam traps as well as electrical current data associated with electrical machinery. This analysis is expected to reduce energy loss and help predict abnormalities.

Of course, we must also spare no effort in ensuring that we deserve the trust customers place in us with regard to product quality and safety. In recent years, a number of quality-related incidents have been exposed at major Japanese corporations. As a manufacturer, Denka is determined to not let any such incident happen and is striving to enhance the level of its quality assurance on various fronts.

Nurturing employees equipped with specialized skills via the pursuit of work style reforms, workforce diversity and human resource development

In addition to improving operational productivity, we will nurture human resources equipped with specialized skills and, to this end, pursue such initiatives as work style reforms, workforce diversity and human resource development. These initiatives are intended to enhance employee happiness, shift our focus from "quantity" to "quality" in terms of working hours and facilitate innovation.

## 4 Our Resource Allocation Plan

We aim to steadily return profits yielded by our five-year initiatives executed under the "Denka Value-Up" management plan to shareholders. Specifically, we remain committed to attaining the targeted total shareholder return ratio of 50%. We have also set aside a total of ¥200 billion to undertake investment for securing further growth over the course of five years. (Of this, ¥75 billion will be appropriated for strategic investment, such as M&A.)

In these ways, we will work to ensure our financial soundness while maximizing shareholder returns and the resources available for forward-looking strategic investments. By doing so, we will realize the objectives of the Denka Value-Up management plan.

## 5 In Closing

We have defined "Taking on the challenge of expanding the possibilities of chemistry to create new value and contribute to sound social development" as the Denka Mission. As a chemical manufacturer, we are acutely aware of the role we must fulfill to help resolve issues society is now confronting in the furtherance of such international initiatives as the United Nations Sustainable Development Goals (SDGs). Moreover, we are determined to fully assume our social responsibilities in terms of the prioritization of safety, the preservation of the environment, the development of human resources and contribution to communities in which we operate. We will thus become a specialty-fusion company capable of achieving sound and sustained growth.

We sincerely ask for your ongoing support for our Group operations.

On Saturday, March 3, 2018, an accident occurred at the Omuta Plant involving the collapse of raw material bulk bags that resulted in the death of an employee.

Following a major accident in 2013 at the Omi Plant, we vowed to prevent the recurrence of such incidents. Since then, we have positioned the prioritization of safety as the foundation of all our business activities and have pushed forward safety countermeasures. Although we believed that these efforts were steadily progressing, we are now sobered by the knowledge that another major accident could occur and deeply grieve the loss of our valued colleague.

As president, I am committed to spearheading the thoroughgoing implementation of measures to prevent accidents of this kind. Accordingly, we have rallied the Company's overall strengths to implement said measures. Denka believes that placing the utmost priority on safety is a definite prerequisite for the survival of a company within society. With every employee taking safety to heart, we will humbly go back to the basics and review our routine actions in the course of day-to-day operations as part of efforts that prioritize safety in every aspect of our corporate activities.

\*SBC, MS and IP SBC: Styrene-butadiene copolymer, also known as CLEAREN  
M S: Methyl methacrylate styrene copolymer transparent resin  
I P: Styrene-N-phenylmaleimide-maleic anhydride copolymer used as an ingredient for a maleimide-based heat-resistance agent

## Special Feature 1: Dialogue—What Denka Must Do to Create New Value over the Medium to Long Term

### Satisfying Stakeholder Expectations via the Pursuit of *Denka Value-Up*

Mr. Atsushi Ikeda from Citigroup and Denka President Manabu Yamamoto engaged in the following dialogue, which provides an insight into Yamamoto's thoughts regarding the implementation of the plan while revealing Mr. Ikeda's assessment of Denka's efforts to enhance its corporate value.

Director, Stock Research Dept., Citigroup Global Markets Japan Inc.

**Atsushi Ikeda**

2005 Graduated Keio University's Graduate School of Science and Technology, School of Science for Open and Environmental Systems  
 Jointed Citigroup Global Markets Japan, charged with serving 22 clients in chemical and synthetic fiber sectors

Representative Director, President & CEO Denka Company Limited

**Manabu Yamamoto**



#### Although the Denka100 management plan yielded robust outcomes, from this point forward we need to exert more control. (Yamamoto)

**Yamamoto:** In fiscal 2017, we could see that the Denka100 growth strategies launched in 2013 had gradually picked up momentum and were yielding positive outcomes. Moreover, we began implementing some Denka Value-Up initiatives aimed at promoting specialization ahead of their scheduled fiscal 2018 launch. This also affected our business results positively. However, we must note that the favorable market environment served as a tailwind. Taking this factor into account, we really need to exert a bit more control and be vigilant as we implement initiatives through the course of fiscal 2018 and later.

**Ikeda:** Denka has certainly succeeded in securing greater market presence by maximizing the positive effect of its 2015 acquisition of DuPont's chloroprene rubber business. The Company was also successful in its acquisition of Icon Genetics GmbH, striking a pivotal M&A deal that, in turn, helped it develop a robust foundation for promoting specialization.

**Yamamoto:** Although we clearly distinguish "specialty businesses" from "key operations," we also aim to specialize some "key operations," especially those associated with chloroprene rubber and highly functional styrene-based resin. Simultaneously, we intend to promote the downsizing and streamlining of "commodity businesses" that are intrinsically unsuitable for specialization.

**Ikeda:** Taking a look at Denka's specialty businesses, the Company boasts technological strength in the healthcare field backed by a track record spanning



nearly 70 years. This track record is a testament to the high reliability of Denka products in this field. In the last two years, Denka also achieved solid growth in sales of electronic materials, a field in which the Company already commands significant market share. With regard to key operations, Denka has seized a 40% share of the chloroprene rubber market. This has fed the expectations of a growing number of buyers that Denka will become the chloroprene rubber specialist. I think that this status will positively affect Denka's stock prices.

#### There are few corporations capable of placing the utmost priority on the pursuit of vision. (Ikeda)

**Yamamoto:** Our threefold growth vision serves as a cornerstone for the Denka Value-Up management plan and is intended as a shared vision for all employees. We encourage employees to inspire each other to act to realize the ideals defined by this vision. By doing so, we ultimately aim to garner worldwide recognition, creating a company that all workers can be proud of.

**Ikeda:** Denka's management places significant emphasis on sharing its vision with employees in the course of the implementation of its management plan. I find this approach to be highly compelling as it indicates the Company has well-thought-out policies with regard to recruiting and nurturing competent and spirited human resources. While the majority of corporations tend to prioritize quantitative targets, Denka places its utmost priority on the pursuit of its vision. I don't think many corporations can say the same. The other day, I toured Denka's plant in Singapore and was able to take a close look at its production frontlines. Having seen a number of operators working enthusiastically, I was convinced that the Company's vision is shared by all.

**Yamamoto:** I believe that it is essential to ensure that management and employees share a common understanding about the future direction of initiatives while they are under way. Accordingly, I try to visit business sites and production frontlines as often as

possible to directly interact with employees. Not only do I visit Denka's business sites, I also tour affiliates and overseas subsidiaries and endeavor to foster a sense of unity among their frontline employees. Through these efforts, I intend to provide employees with the direct and accurate explanation of the Denka Value-Up management plan. Furthermore, I am involved in the production of video messages aimed at ensuring that the goals of this management plan are known by all employees.

**Ikeda:** It is essential for frontline workers to understand where the Company is heading, its strengths and how it is going to enhance these strengths. Moreover, they need to understand how their tasks relate to the Company's overall strategies. Once they are aware of what they actually can and should do to help the Company achieve its goals, their mindset will change and no longer be hindered by the barriers defining sections. I expect that this will, in turn, foster willingness to lend generous assistance to initiatives undertaken by other business units within the Group.



#### Securing staff equipped with specialized skills is the key to the success of the Denka Value-Up management plan. (Ikeda & Yamamoto)

**Yamamoto:** Denka's businesses must be supported by employees with a strong sense of ownership about specialization. When the organization is lacking such employees, its business can quickly become obsolete no matter how special it might have been. Conversely, a group of employees who have high awareness of specialization is capable of developing specialty businesses even from "commodity businesses."

**Ikeda:** Preventing a brain drain and protecting proprietary technologies are also important to specialization. Therefore, it is particularly essential to help those engaged in engineering and R&D to enhance their motivation. In addition, the accuracy of market intelligence is ever more crucial when specialized businesses have come to account for a significant portion of a corporation's business portfolio. Such a corporation must remain on-trend with sector-specific business conditions while staying vigilant against changes under way in the industry. Also, a new technology emerging from a totally different business sector may grow into the game changer. I therefore believe that Denka should pay close attention to technological trends in other sectors.

**Yamamoto:** I agree. To this end, we need to develop a structure supported by employees who are committed to proactively collecting market intelligence. This also relates to the importance of work style reforms to enhance employee motivation. I expect that the success of the Denka Value-Up management plan will largely hinge on our initiatives regarding these matters.

#### We seek to become a specialty chemical company capable of achieving long-term growth. (Yamamoto)

**Yamamoto:** From the viewpoint of securing long-term growth, we recognize that addressing environmental, social and governance (ESG) issues is an integral part of our corporate activities. With this mind, we aim to increase the proportion of clean energy in overall energy consumption associated with our business activities. This is an example of initiatives we are undertaking to mitigate the potential negative social impact of our operations. We are also endeavoring to positively impact society by, for example, donating Ebola virus rapid diagnostic test kits to the Democratic Republic of Congo. In these ways, we are actively delivering our solutions to people around the world to help resolve issues society is now confronting in the healthcare and other fields.

**Ikeda:** Denka is one of few domestic corporations that can boast its own extensive network of hydroelectric power plants. The Company also delivers a broad range of materials designed to facilitate energy saving. I think that Denka should be able to attract investment by letting investors know these factors.

In addition, Denka boasts such unique products as Ebola virus rapid diagnostic test kits while providing vaccines for influenza and other products. No other chemical company can claim a product lineup of this kind. Because of this, I believe that Denka has an advantage over competitors in terms of providing solutions for social issues.

**Yamamoto:** With regard to governance, three outside directors attend Denka's Board of Directors meetings, proactively contributing their insight to management and helping all other board members engage in active discussions.

We remain committed to a targeted total shareholder return ratio of 50% as well as a targeted dividend payout ratio of 40%. The value of full-year dividends for fiscal 2017 has been set in line with this dividend payout ratio. For fiscal 2018, our plans call for maintaining the same level of dividends.

**Ikeda:** I think that Denka's approach to shareholder returns is well-balanced. Aiming for a total shareholder return ratio of 50% is plausible in light of the composition of the Company's free cash flows and its investment fields. Furthermore, Denka's commitment to a dividend payout ratio of 40% would help the Company win the confidence of investors, especially those overseas. I therefore suppose that Denka's commitment to this target will help it win investor confidence.

**Yamamoto:** In terms of garnering global recognition, Denka has a long way to go. Over the long term, we will strive to become a specialty chemical company known for its unparalleled strength in markets around the world. (Held in June 2018 at Denka's Head Office)





# CSR Management

We will remain committed to fulfilling our social responsibilities with the aim of living up to The Denka Value, our corporate philosophy, as well as society's expectations and trust.



## Denka Group CSR Basic Policies

Denka hereby establishes the Denka Group CSR Basic Policies, which are designed to provide underlying principles with regard to the practice of The Denka Value, a corporate philosophy, from the perspective of addressing environmental, social and governance (ESG) issues.

As the cornerstone of all business activities, The Denka Value consists of the Denka Mission and the Denka Principles, both of which highlight our aspiration to contribute to the sound development and betterment of society. We are thus striving to embody these precepts, believing that contributing to a sustainable society is an integral part of our corporate activities and is essential to fulfilling our corporate social responsibilities.

With this in mind, we have identified CSR materiality issues through stakeholder dialogue, specifying the areas in which all Group members must focus their efforts in terms of CSR activities. Taking a future-thinking approach, we are also working in tandem with our business partners to contribute to the United Nations Sustainable Development Goals (SDGs) and other initiatives aimed at addressing issues the whole of humanity is now confronting.

Furthermore, we recognize that strict compliance is a prerequisite for continued business operations. Accordingly, we will strive to develop an effective governance system, strictly complying with laws, regulations and international rules in the course of operations while maintaining a strong moral compass.

Taking the aforementioned factors into account, we will practice the ten principles described on page 16 in furtherance of our efforts to fulfill our responsibilities as a corporate citizen.

## Addressing CSR Materiality Issues

Denka has carefully selected its materiality issues based on pressing challenges society is now facing and in reference to external inputs, including United Nations SDGs; guidelines compiled by the GRI; the ISO 26000 and other international standards; as well as prevailing ESG investment criteria and insights the Company has gained through its involvement in the CDP and CSR procurement. Moreover, these items were examined and evaluated with due consideration given to stakeholders' expectations and their impact on our operations.

The status of and action plans involving the Company's initiatives to address CSR materiality issues are reported to the Management Committee biannually. Looking ahead, we will also review these materiality issues as necessary.

## SDGs Relevant to Our Materiality Issues

While Denka classifies its CSR materiality issues into six categories and 13 items that are critical in its role as a chemical manufacturer committed to fulfilling its social responsibilities, the United Nations SDGs also have relevance when considering these issues. The relationship between Denka's CSR materiality issues and the SDGs is presented in the chart on page 16. Denka is thus determined to contribute to SDGs in the course of addressing its materiality issues.

## Denka Group CSR Basic Policies

<b>E</b> Environmental preservation and protection	We will proactively facilitate the use of clean energy, take on the development of eco-friendly products and technologies, and promote energy-saving and resource-recycling measures. By doing so, we will help preserve and protect the global environment.
<b>S</b> Value creation via manufacturing	Through the pursuit of innovation, we will deliver products, services and solutions capable of supporting sustainable economic growth and helping resolve issues society is now confronting.
<b>S</b> Prioritization of safety	We will steadfastly abide by our policy of placing the utmost priority on occupational safety, employee health, facility security and disaster prevention in all aspects of our business activities. In this way, we will create a workplace free of accidents and disasters.
<b>S</b> Relationships of trust with customers	We will commit ourselves to delivering products with superior quality while providing sufficient product information to ensure customer satisfaction. We will also remain sincere in customer relations, thereby maintaining relationships of trust with customers.
<b>S</b> Diversity and work-life balance	Respecting the diversity, personalities and unique qualities of all those working for the Denka Group, we will strive to help them determine optimal working styles to ensure they realize their full potential. At the same time, we will create a vibrant workplace, promote employee health and realize a safety-oriented corporate culture.
<b>S</b> Respect for human rights	We respect the human rights of all people while striving to raise human rights awareness and helping to eradicate all kinds of human rights infringement.
<b>S</b> Information disclosure and stakeholder dialogue	We will disclose corporate information in a proactive, effective and fair manner, thereby maintaining constructive dialogue with a wide range of stakeholders.
<b>S</b> Social contribution	As a good corporate citizen, we will proactively play a positive role in society to contribute to sound and sustainable social development.
<b>G</b> Fair business conduct	We will engage in fair and free competition, appropriate dealings and responsible procurement while maintaining sound relationships with political bodies and administrative agencies.
<b>G</b> Risk Management	In addition to remaining apprised of risks that may affect our corporate activities, we will implement thoroughgoing and organized crisis management measures to secure resilience against natural disasters, terrorism cyberattacks and other events that cause serious threats to our operations.

## Relationship between Denka's Materiality Issues and SDGs

Category	CSR Materiality Issues (13 items)	Relevant SDGs	
		Fulfill manufacturers' responsibilities	Provide solutions
Prioritization of safety	Reinforce security and disaster prevention measures Maintain occupational safety and health while creating a vibrant and comfortable workplace environment	3, 8	
Products and technologies	Create new products and technologies that contribute to sound social development Ensure product safety	7, 9, 12, 13, 14, 17	2, 3, 5, 6, 7, 8, 9, 11, 13, 14, 15, 17
Corporate governance Corporate conduct deserving stakeholder trust	Ensure that our corporate philosophy is embraced by every employee and transform our corporate culture Improve corporate governance Maintain strict compliance with laws, regulations and corporate ethics	4, 5, 16	
Employee happiness	Nurture human resources Embrace diversity and offer equal opportunities Help strike a work-life balance and promote employee health	3, 4, 5, 8, 10	6, 11, 13, 14, 15
Environmental preservation	Prevent air, water, soil and other environmental pollution Promote climate change countermeasures (curb global warming, reduce GHG emissions and adapt to climate changes)	6, 11, 12, 13, 14, 15	
Dialogue with society Partnership	Maintain appropriate and timely disclosure of corporate information and establish bidirectional communications	17	

## E Initiatives to Preserve and Protect the Environment

Taking a proactive stance toward the prevention of global warming and the preservation of the global environment, we strive to promote the use of clean energy as well as the development of eco-friendly products, thereby contributing to the sustainable development of society.

The Denka Group is proactively engaging in initiatives to help preserve the global environment. In this section, we introduce initiatives in the following three areas.

- 1 Promoting the use of clean energy
- 2 Developing eco-friendly products
- 3 Curbing greenhouse gas (GHG) emissions

### 1 Promoting the Use of Clean Energy

Since its founding, Denka has promoted the greater use of clean energy and to this end has continually expanded its network of hydroelectric power plants. Today, the Company owns hydroelectric power plants at 10 locations near its Omi Plant in Itoigawa City, Niigata Prefecture. In addition, Kurobegawa Electric Power Company, a joint venture owned by Denka and Hokuriku Electric Power Company, maintains hydroelectric facilities in five locations in the region. Together, the maximum output of these 15 plants totals approximately 120,000kW, enough to power approximately 200,000 regular households on an annual basis. The extent of its power generation capacity sets Denka apart from other domestic private chemical companies.

Meanwhile, at our thermal power plants, which are being converted to run on natural gas instead of heavy oil, we are working to introduce high-efficiency gas turbine generators. We also utilize heat from cement production for power generation while employing biomass boilers fed by scrap wood for the same purpose. These efforts have helped us reduce CO<sub>2</sub> emissions attributable to energy use. Also, the Shibukawa and Isesaki plants (both in Gunma Prefecture) have been selling electricity generated by their mega solar power generation facilities to an electric power company.

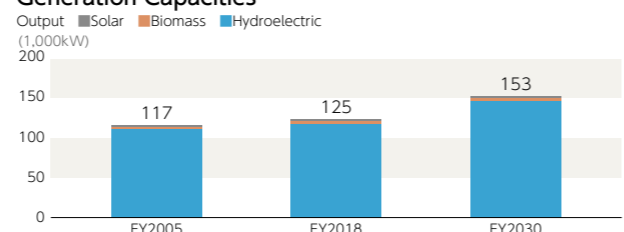
#### Hydroelectric Power Plant Construction Ongoing in Two Locations

We are presently in the midst of constructing two new hydroelectric power plants. One, the New Omigawa Power Plant (maximum output: approximately 8,000 kW), is under construction upstream of the Omigawa Power Plant. Thus far, conduit tunnels have been installed and work is ongoing on such facilities as water intake facilities and power plant buildings. The second project, the New Himekawa Power Plant No. 6 (maximum output: approximately 27,500kW), is being constructed by Kurobegawa Electric Power Company. We expect that the completion of these power plants and the impact of our initiatives to improve power generation efficiency will yield

The New Omigawa Power Plant under construction

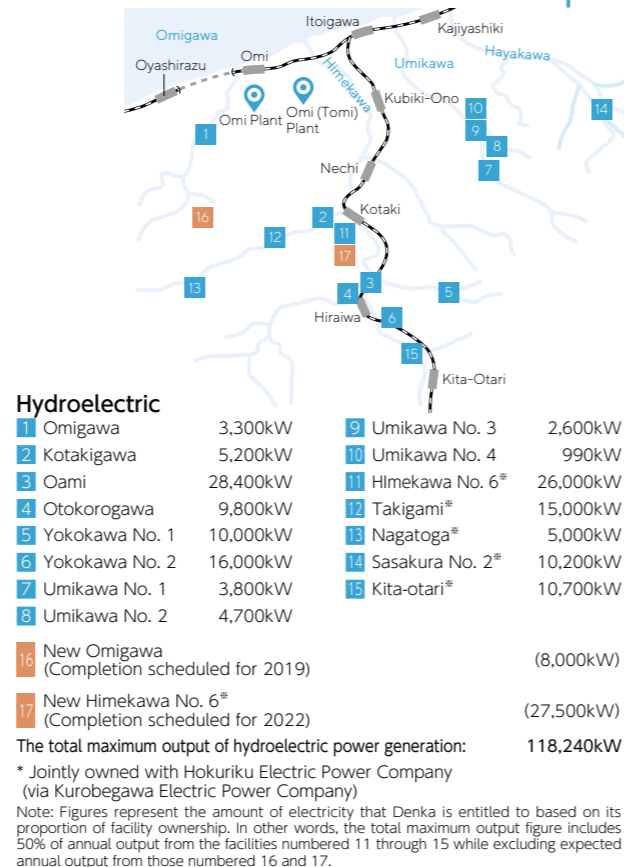
a 40,000 ton reduction in our annual CO<sub>2</sub> emissions. Denka intends to step up the use of clean energy, aiming to raise the ratio of renewable energy to overall in-house energy consumption (including electricity sold externally) to 50% by the end of fiscal 2030.

#### Long-Term Outlook for Our Renewable Energy Generation Capacities



Note: The calculation of the figures presented above incorporated 50% of annual output from power plants run by Kurobegawa Electric Power Company (jointly owned with Hokuriku Electric Power Company).

#### Hydroelectric Power Plants around the Omi Plant and Their Maximum Output



### 2 Developing Eco-Friendly Products

In line with the Denka Value-Up management plan, our initiatives aimed at specializing our operations include the development of products and technologies that help promote energy saving and the use of renewable energy. To this end, we employ our expertise in chemistry and manufacturing, with the aim of addressing global warming, a universal issue society is now confronting.

For example, our thermal control technologies are used in such electric vehicle (EV) components as driving parts, while our electro-conductive materials are used in the batteries of such vehicles. As such, we are providing essential technologies supporting EVs, a type of vehicle that is expected to become increasingly popular in countries around the globe.

Other Denka offerings serving the automotive industry include ceramics-based electronic circuit substrates (DENKA SNP and ANP) for power control units and electro-conductive materials for lithium ion secondary batteries (acetylene black). Both of these products are supporting innovation in terms of creating eco-friendly automotive technologies.



### 3 Curbing Greenhouse GHG Emissions

Having set reduction targets for total GHG emissions as well as the CO<sub>2</sub> emissions intensity index attributable to energy sources, we are systematically implementing global warming countermeasures by engaging in energy-saving initiatives and promoting the use of renewable energy. Thanks to these efforts, the London-based international non-profit organization CDP granted Denka an "A-" rating in its Climate Change Report 2017, the highest such rating given to Japanese chemical companies. Looking forward, the Company has begun discussing the formulation of medium- to long-term targets (for 2030 and 2050) in light of the "2°C target" proposed in the Paris Agreement.

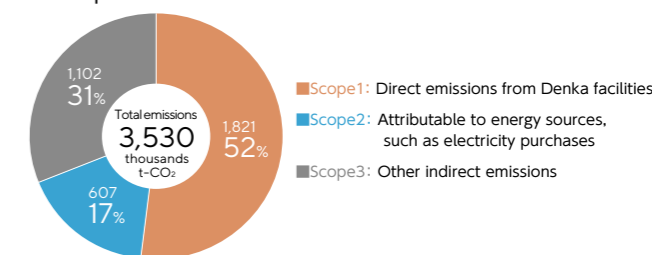
Our fiscal 2017 GHG emissions, which encompass Scope 1, 2 and 3 emissions, totaled 3,530 thousand t-CO<sub>2</sub> (graph 1). Our efforts to reduce our GHG emissions, especially Scope 2 emissions through the steady promotion of hydroelectric power generation and stepped up energy-saving measures will continue.

#### Climate Change: Risks and Opportunities

	Risks	Opportunities
① Legal Regulations	A surge in fossil fuel and energy costs due to the enforcement of tightened CO <sub>2</sub> emission regulations based on the Paris Agreement	Growth in business opportunities arising from demand for Denka's energy-saving technologies
② Physical Impact	Frequent operational disruption at manufacturing bases and other business sites due to an increase in flooding, rainstorms and mega typhoons	Growing need for ultrahigh-strength concrete that enhances the resilience of concrete structures and infrastructure components (such as expressways) as well as for quick-hardening and setting concrete that supports the timely restoration of such facilities following natural disasters
③ Others	Growing uncertainty regarding stock prices and our corporate reputation due to ever harsher scrutiny of the Company's climate change countermeasures as shareholders and investors began to place stronger focus on ESG investment	Growing need for Denka products capable of helping reduce CO <sub>2</sub> emissions on the back of an overall shift to low-carbon operations among supply chain constituents

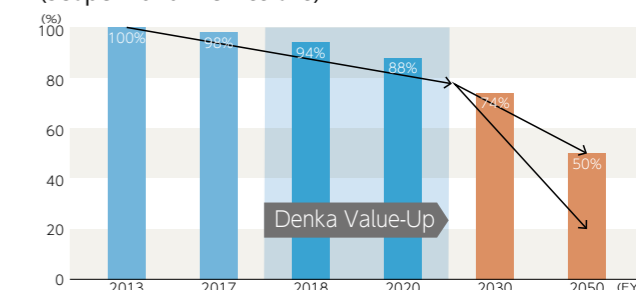
In addition, we intend to strategically reduce our Scope 1 emissions, which consist of direct emissions and account for 52% of total GHG emissions, still further. To this end, we will promote the specialization of products associated with cement and calcium carbide as GHG emissions attributable to these products account for more than 60% of Scope 1 emissions.

Graph 1: Our Fiscal 2017 GHG Emissions



Graph 2 presented below outlines our future outlook for reduction in Scope 1 and 2 emissions. Identifying ideals for the Denka Group, this outlook takes into account 2030 and 2050 targets defined by the Paris Agreement, an international framework for countering global warming.

Graph 2: Future Outlook for GHG Reduction (Scope 1 and 2 emissions)



#### Reduction Targets

- Total GHG emissions: Reduce 12% by 2020 compared with the 2013 level
- CO<sub>2</sub> emissions intensity index attributable to energy sources (per unit of production): Reduce 10% by 2020 compared with the 2013 level

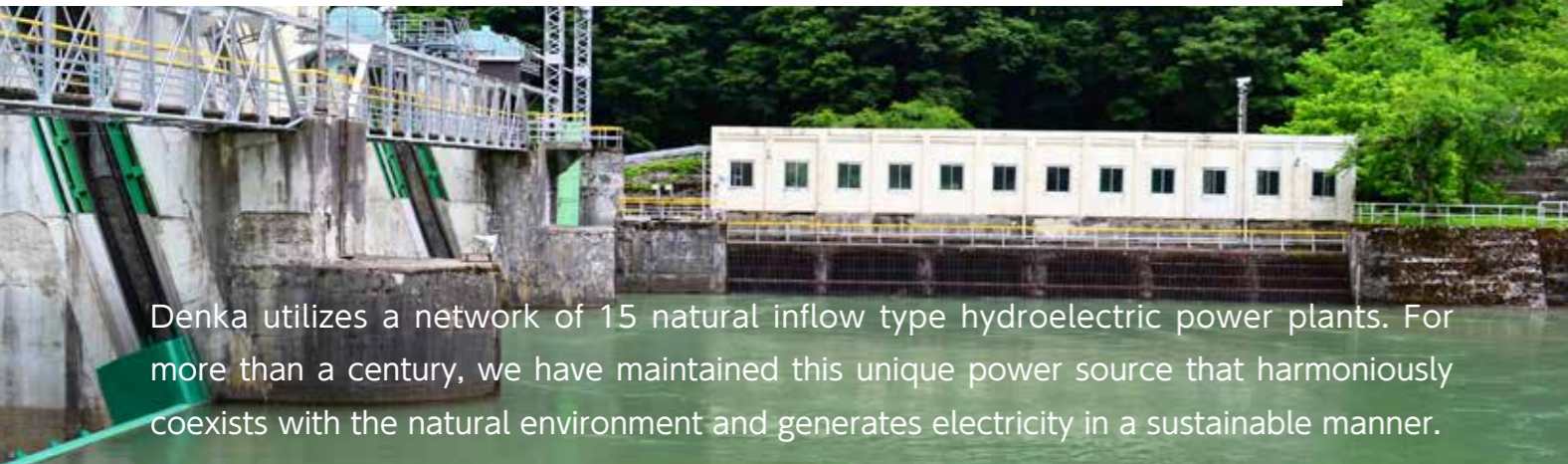
#### Our Initiatives to Promote Energy Saving

As part of production process reforms, the Omi Plant is renewing its electrolytic bath facilities with the aim of reducing energy consumption while pushing ahead with energy-saving efforts focused on improving calcium carbide raw materials production. Efforts are also under way to introduce high-efficiency gas turbines to the plant's thermal power generation facilities with the aim of reducing energy consumption and CO<sub>2</sub> emissions.

Meanwhile, the Chiba Plant suspended the operation of one boiler and its attendant power generation system and has since then been receiving steam from adjoining facilities run by Maruzen Petrochemical. This move was one example of the plant's initiatives to optimize its utility supply structure through the strengthening of collaboration between corporations operating in the same industrial complex.

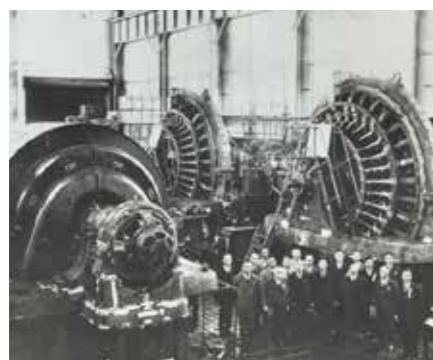
Looking ahead, Denka will promote energy-saving measures to maintain its "S Class" grading, which indicates the Company's standing as an excellent business operator, in accordance with a government-sponsored system for classifying business operators under the Law Concerning the Rational Use of Energy.

## E Special Feature 2 | Denka's Hydroelectric Power Plants



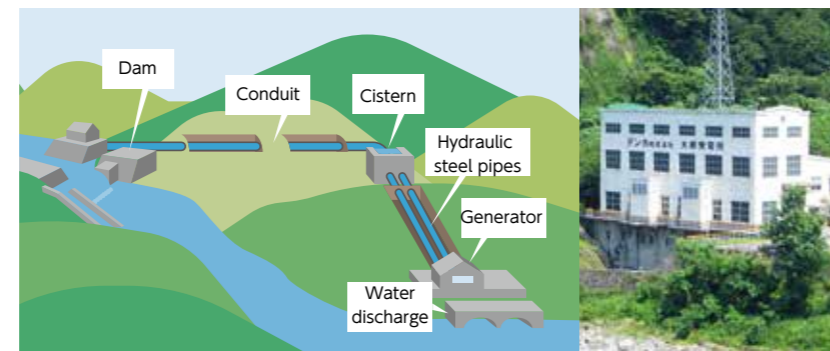
Denka utilizes a network of 15 natural inflow type hydroelectric power plants. For more than a century, we have maintained this unique power source that harmoniously coexists with the natural environment and generates electricity in a sustainable manner.

A view of the Oami Power Plant's facilities near the water intake



In 1931, Oyodogawa Power Plant No. 2, boasting a maximum output of 30,000kW, was completed in Miyazaki Prefecture to feed power to Denka's Omuta Plant

### How a natural inflow type hydroelectric power plant works



A long conduit guides upstream water separated from the river by the dam to a generator placed in a downstream location. Unlike reservoir type power plants, this mechanism is able to utilize the momentum of water attributable to vertical difference without significantly interrupting the natural flow of the river.

A stable power supply and efficient energy usage are essential to the manufacture of industrial chemical products. Over the years, the Omi Plant has utilized a robust network of power generation, transmission and distribution facilities while accumulating technological expertise with regard to the construction and operation of power plants. These facilities and expertise have been important management resources for the more than a century since the Company's founding.

There are 15 natural inflow type hydroelectric power plants, including co-owned facilities, in areas around the Omi Plant. This type of hydroelectric power plant places a relatively smaller burden on the natural environment due to the use of natural inflow of river water for power generation. There is no need to create a reservoir, and water used for power generation is returned to the river as soon as it leaves the generator. Moreover, hydroelectric power plants generate virtually no greenhouse gases while serving as a renewable energy source with superior energy efficiency. Thus, these power plants are capable of harmoniously coexisting with the natural environment while generating electricity in a sustainable manner.

### Working to Secure Electricity via Hydroelectric Power Generation for More than a Century

Itoigawa City, Niigata Prefecture, is located in a region that faces the Sea of Japan and is surrounded by steep mountain ranges leading to the northern Alps. This region boasts abundant water resources, with a number of rivers flowing down steep slopes. Because of this, the development of hydroelectric power generation facilities has been under way in the region since the late Meiji period. In 1921, Denka established the Omi Plant in Itoigawa via the merger of two power companies (Hokuriku Suiden K.K. and Takasago Suiryoku Denki K.K.) that had held mining rights to limestone mines along with water rights. The Kotakigawa Power Plant, which the latter was in the midst of constructing at the time of merger, is still in operation. Due to the merger, this power plant became a Denka facility once completed and began supplying electricity to calcium carbide and calcium cyanamide production facilities that the Company had newly established for the launch of the Omi Plant.

In 1923, the Otokorogawa Power Plant was established and this was followed later by the Umikawa, Oami, Omigawa, Yokokawa and other power plants. Today, Denka utilizes a total of 15 hydroelectric power plants, including co-owned facilities.

### 1. Water Intake from Rivers and Harmonious Coexistence with Nature Water Intake Dam for the Oami Power Plant

The Oami Power Plant, located on the Himekawa river system, is equipped with automated dam gates that operate based on data on weather and river conditions gleaned by its observation system. Automatically keeping the volume of water intake within the upper limit granted by local authorities, the plant operates in a way that has little impact on flow volume or water level.

Although the steepness of the terrain that is home to the Himekawa river system offers inherent advantages to hydroelectric power generation, rivers in these areas are prone to becoming choked with soil, sand and logjams after rainfalls because of fragile ground conditions. Sediment and floating detritus can drift into dam intakes, hindering power plant operations. Accordingly, whenever the region is hit by heavy rainfalls, typhoons or other stormy weather, administrators have staff on standby at stations near the dams to address any problems.

Water is diverted from the main body of the river by the water intake dam and guided to a grit chamber where soil and sand are settled out. At this point, smaller floating objects like driftwood are removed using a screen as well as manually. This can be a dangerous job so staff are extremely vigilant. The water then flows through a conduit to a cistern and finally to the generator via hydraulic steel pipe.

To minimize the impact of power plant operations on the natural environment, we have installed a fishway alongside the dam, thereby demonstrating our commitment to pursuing a harmonious coexistence with nature.



Water intake dam for the Oami Power Plant



A fishway installed alongside the dam



The Umikawa Power Plant No. 2's hydraulic steel pipes are installed on a steep mountain slope



One of the entrances to the tunnel leading to the power plant



A closer look at the hydraulic steel pipes

### 2. Pursuing Ever Higher Power Generation Efficiency Umikawa and Kotakigawa Power Plants

Like the facilities discussed above, the four power plants located on the Umikawa river system boast a long history, with the Umikawa Power Plant No. 3 having initiated operations in 1925. The No. 1, 2 and 4 plants were launched in 1930.

Among these, the Umikawa Power Plant No. 2 is situated in a steep mountain range. Accordingly, the development of mountain forests and trails has been key to operating the plant. Moreover, because winter snowfalls often render the mountain trails around the plant impassable, we constructed dedicated tunnels for operators.

The Kotakigawa Power Plant initiated operations in 1921 and is the oldest among Denka's hydroelectric power plants. For nearly a century since its completion to the present day, the plant's building has been in continuous use. Made of wood, this historical building boasts superior durability thanks to a unique structure comprising two separate frames, with one frame supporting a built-in crane installed to carry heavy objects and the other frame supporting the building's roof. A Francis turbine runner manufactured by Switzerland-based Escher Wyss and installed at the time of its completion, is still preserved at the site and is labeled the "No. 1 turbine runner." In 2017, we launched the No. 3 turbine runner, a cutting-edge Francis turbine runner and generator.



The Kotakigawa Power Plant main building

The Kotakigawa Power Plant's cutting-edge Francis turbine runner

### 3. The Hydroelectric Power Museum

In May 2018, we opened the Hydroelectric Power Museum. Along with a century of historical records, the museum exhibits a cross-sectional sample from the hydraulic steel pipe that was used at the Kotakigawa Power Plant in its earliest days as well as a precise miniature duplicate of the plant and surrounding land created by a staff member at the Electric Power Department. Our hydroelectric power plants are a proud legacy and remain one of our key management assets. Moreover, since these facilities produce renewable energy, they have become ever more important given growing expectations regarding clean energy due to the looming threat of global warming. The museum is serving as a venue for communication with visitors, helping them learn about the passions driving Denka staff, who have maintained hydroelectric power plant operations since the Company's founding to the present. At the same time, the facility helps us pass along our long-cherished commitment to these operations to future generations.

## S Human Resource Development

Strategically focusing on nurturing human resources with specialized skills, we will promote diversity, push ahead with work style reforms and thereby create an even more attractive company.



### Nurturing Human Resources and Passing Down Our Technologies to Future Generations

#### Denka's Strategies Aimed at Nurturing Human Resources with Specialized Skills

Denka sees its employees as invaluable assets supporting its foundation. The Company also believes that truly successful corporate growth hinges on employees' efforts to achieve personal growth and enhance their skills. With this in mind, we are taking a strategic approach toward human resource development.

Our aim is to promote the specialization of our businesses, products, technologies and all other aspects of operations. In line with this, we also intend to equip our human resources with specialized skills. Accordingly, we are striving to help each employee build robust careers rooted in their intrinsic strengths (i. e., mindset, competency and personality) while assisting them in their efforts to enhance their skills in the area of their specialty. In these ways, we are endeavoring to help each employee realize their full potential and become a professional with unparalleled presence in their business field.

In April 2018, we launched the Career Value-Up Center, a dedicated body charged with equipping human resources with the features described above, while upgrading the content of the ongoing Specialty Human Resource Development Program. These moves are expected to better position the Company to provide assistance to employees who are willing to autonomously pursue personal growth and proactively build robust careers. By doing so, we are stepping up our across-the-board efforts aimed at achieving targets under Denka Value-Up, our medium-term management plan.

#### The Specialty Human Resource Development Program

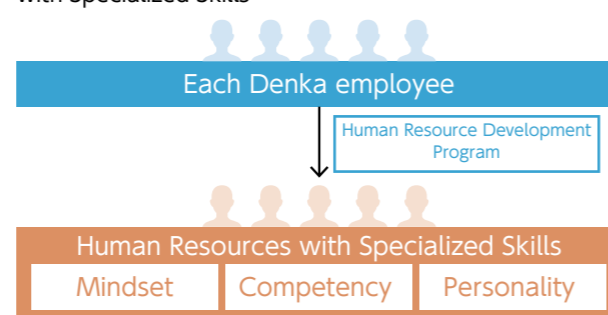
Having thoroughly upgraded the content of this human resource development program, we have renewed safety training sessions that simulate dangerous situations and are designed specifically for those working at production sites and R&D bases. We have also enhanced the curriculum associated with production processes for engineers. The upgraded program consists of 200 types of training sessions, including job-level based training tailored for a broad range of employees encompassing not only managers but younger employees who will someday become the Company's leaders.

The program also includes a number of specialist courses.

In fiscal 2017, we also introduced executive officer training as well as manager training for selected candidates with the aim of enhancing their management and leadership skills as part of job-level based training. Furthermore, specialist courses now include a number designed to instill specialized skills in such fields as marketing, M&A and business strategies, with stronger focus placed on nurturing business innovators.

Also, in response to the rapid globalization of Denka's business operations, the Company focuses on recruiting and nurturing human resources capable of succeeding on the global stage from the earliest stages of their careers. In particular, we are proactively hiring new graduates who have studied overseas. Moreover, we dispatch administrative specialists in their second year and technological specialists in their fifth year to the Group's business base in Singapore to participate in two-week overseas missions as part of training aimed at helping them acquire a global perspective. In these ways, we are working to secure personnel capable of leading Denka's global operations in the future.

#### Denka's Strategies Aimed at Nurturing Human Resources with Specialized Skills



### Ensuring Respect for Diversity and Helping Women Achieve Success

#### Promoting Diversity Your value is Denka's value,

In October 2017, Denka established the Diversity Promotion Section to step up its diversity initiatives aimed at realizing sustained and sound growth. Under the slogan "Your value is Denka's value" we are proactively striving to create a workplace environment in which everyone can stay healthy and work vibrantly regardless of such personal

attributes as gender, age, nationality, disability or family composition.

We are undertaking a variety of initiatives aimed at raising employee's diversity awareness, including seminars and workshops. Also, lecture sessions are held for executive officers and plant managers. In addition, we distribute a wealth of information via such mediums as our dedicated intranet portal to support employees' self-directed education efforts. We intend to acquire employee feedback and utilize it in the course of organizing and planning future initiatives.

We aim to maintain the proportion of women among newly hired specialists at 20% or more. In April 2018, we welcomed 14 newly hired female specialists. This was 33% of those taken on as specialists in this hiring session and was well in excess of the targeted minimum.

In the face of globalization on the business front, we are striving to develop a more flexible workforce supported by young employees equipped with leadership skills. Accordingly, we focus on securing promising new graduates regardless of nationality. As a result, in April 2018 four foreign nationals joined the Company to become specialists. Taking into account the diversified composition of our human resources, we began providing career education aimed at raising employee awareness of what they themselves can do to develop their careers. Moreover, we are now considering establishing an in-house job posting system as well as a free agent (FA) system to encourage employees to take on more challenging missions.

Looking ahead, we will engage in ongoing initiatives to raise diversity awareness while reviewing our personnel systems, including evaluation and wage systems. We will also develop more flexible working shifts. Furthermore, we will strive to nurture human resources equipped with specialized skills and capable of leading the implementation of the medium-term management plan. Simultaneously, we will pursue operational process reforms, such as the introduction of AI and IoT to standardize operational procedures along with facility upgrades aimed at realizing labor-saving processes. We will thus accelerate our efforts to promote diversity.

### Helping Employees Strike an Optimal Work-Life Balance and Stay in Good Health

#### Employee Happiness Optimal Work-Life Balance and Health Promotion

We are endeavoring to create an inclusive workplace environment, with the aim of helping every employee strike a balance between their duties and family life. These efforts are intended to assist employees in realizing their potential and pursuing career success in even broader fields. Denka Company Limited in particular places strong emphasis on efficient time management and the reduction of excessive overtime hours, based on a recognition that the betterment of working environments is strategically important. With this in mind, the Company introduced a new working hour management system to precisely assess actual working hours and practice more robust control. Through the implementation of operational process reforms, we are creating an even more inclusive workplace and eradicating the logging of excessive overtime hours while facilitating the utilization of annual paid leave.

During fiscal 2017, we introduced staggered work shifts at the Head Office and branches, with the aim of helping employees embrace flexible working styles that are suited to individual lifestyles and duties. We also designated two dates (May 1 and December 29) on which all employees are encouraged to take annual paid leave. This move was intended to promote the utilization of annual paid leave and help employees refresh mentally and physically. Going forward, we will consider rolling out staggered working shifts at production sites and introducing flextime as we aim to help employees adopt more flexible working styles.

Furthermore, our initiatives to help realize an optimal work-life balance include providing employees with assistance in their health promotion efforts, helping them to secure a sound residential environment and expanding annual health check items. We will also subsidize expenses for influenza vaccination for employees' families and are rebuilding dormitories for singles located near each business sites. Our goal is to help employees stay in good health, mentally and physically and thereby ensure that the Company enjoys sound growth well into the future.

#### Employment Status and Diversity Data (non-consolidated basis)

	Fiscal 2014	Fiscal 2015	Fiscal 2016	Fiscal 2017
Number of employees	2,934	2,974	2,960	3,011
Gender	Male: 2,718 Female: 216	Male: 2,743 Female: 231	Male: 2,716 Female: 244	Male: 2,749 Female: 262
Average age	39.7	39.9	40.1	40.5
Average year of service	18.0	18.0	17.7	18.2
New recruits	100	75	84	115
Specialists (hired from new graduates)	Male: 36 Female: 9	Male: 34 Female: 7	Male: 32 Female: 7	Male: 29 Female: 14
Female managers	1	2	2	2
Retiree reemployment rate(%)	89	93	93	95
Ratio of people with disabilities(%)	2.14	2.06	2.06	2.17
Resignees	40	39	41	44
Number of people who resigned within three years of recruitment	3	3	3	6
Ratio of people who resigned within three years of recruitment	7.3	6.7	6.7	6.0

#### Employment Status and Diversity Data (consolidated basis)

	Fiscal 2012	Fiscal 2013	Fiscal 2014	Fiscal 2015	Fiscal 2016	Fiscal 2017
Number of employees	5,206	5,249	5,309	5,788	5,816	5,944
Foreign nationals	347	365	389	826	912	933

# S Prioritization of Safety

We will steadfastly abide by the policy of placing the utmost priority on safety in all of our business activities and decisively promote initiatives aimed at the creation of a lively and sound workplace.



## Companywide Targets

- ① Reduce the number of major accidents and disasters to zero
- ② Continually improve the occupational safety record

## Fiscal 2017 Safety Record

### Major accidents: One occupational safety accident

On March 3, 2018, an accident resulting in the death of an employee occurred at the Omuta Plant. The accident involved the collapse of a bulk bag pile. In response, we have thoroughly investigated the causes of the accident and implemented measures to prevent recurrences in addition to inspecting all business sites in an effort to spot points of potential danger. We have thus improved our methods for piling and storing our products at warehouses while installing more robust measures to secure operator safety even if the storage method fails. Looking ahead, we will strive to mitigate intrinsic danger associated with the loading and unloading of cargo via process reform initiatives.

We remain committed to providing our stakeholders with updates on these initiatives in such disclosure materials as subsequent editions of the Denka Report.

### Facility-related incidents: Four incidents (one leak, one fire and two breakages)

There was a leak attributable to a mistake in the selection of raw materials for components of a facility handling corrosive gas. There was a fire attributable to a failure to execute the required thoroughgoing inspection of flammable materials at a construction site where fire is used. There were two breakages, the first involving the bursting of a resin container due to excessive pressure attributable to an abnormal chemical reaction and the second involving the breakage of a blower. The first incident was the result of operational error and the second was the result of flaws in our in-house rules for managing changes in operational processes.

Although none of these incidents involved human injury or environmental damage, we will implement stringent process risk assessments to ensure that no critical risk is left unaddressed.

### Other occupational accidents: Five accidents involving absence from work; 14 accidents in total

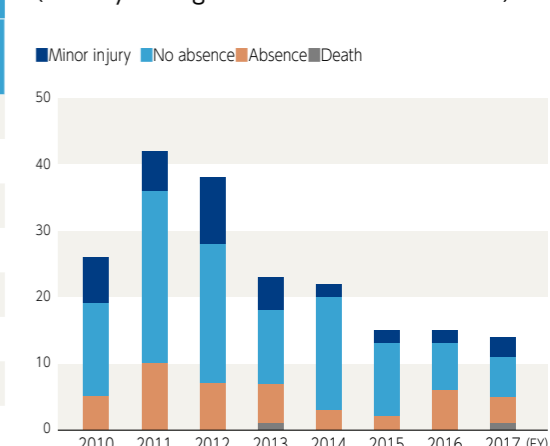
In fiscal 2016, we recorded six incidents, including accidents in which a worker's hand was caught or a worker's body part was pinched by machinery in operation. Drawing lessons from these accidents, we rallied the Company's overall strengths to mitigate risks associated with machinery and equipment as well as to ensure that our basic rules on safety are observed by all workers.

As a result, the number of similar accidents decreased in fiscal 2017 to two. Going forward, we will update our facilities to mitigate the intrinsic danger of machine operations. In addition to reducing facility risks, we will undertake functional upgrading aimed at better safeguarding our operators. Furthermore, we will implement appropriate measures to thoroughly control residual risks.

Breakdown of Number of Occupational Accidents

	Directly managed sites					Subcontractors					Total				
	Death	Absence	No absence	Minor injury	Total	Death	Absence	No absence	Minor injury	Total	Death	Absence	No absence	Minor injury	Total
Fiscal 2010	0	2	8	3	13	0	3	6	4	13	0	5	14	7	26
Fiscal 2011	0	5	17	5	27	0	5	9	1	15	0	10	26	6	42
Fiscal 2012	0	3	17	4	24	0	4	4	6	14	0	7	21	38	
Fiscal 2013	0	1	8	3	12	1	5	3	2	11	1	6	11	23	
Fiscal 2014	0	2	10	2	14	0	1	7	0	8	0	3	17	22	
Fiscal 2015	0	1	6	1	8	0	1	5	1	7	0	2	11	15	
Fiscal 2016	0	2	4	1	7	0	4	3	1	8	0	6	7	15	
Fiscal 2017	1	2	3	1	7	0	2	3	2	7	1	4	6	14	

Total Number of Occupational Accidents (Directly managed sites and subcontractors)



## Fiscal 2018 Priority Initiatives

- ① Prevent major accidents by performing thoroughgoing risk identification and by mitigating intrinsic danger
- ② Eliminate accidents attributable to operator action and ensure the ongoing reduction of occupational accidents
  - Fully leverage findings from near-miss reporting
  - Conduct robust hazard prediction activities at production sites
- ③ Create a lively and sound workplace
  - Promote robust worksite communications about points of potential danger

## Points of Attention for Frontline Operators at All Denka Group Business Sites

- ① Nurture a sense of unity by proactively exchanging courtesies, telling one another "goanzen ni!" (keep safe!) and wishing colleagues a safe day
- ② Practice the 3Ss—Seiri (sort), Seiton (set in order) and Seiso (shine)—as these are the basics of safety
- ③ Pursue the PDCA cycle to promote priority initiatives and share the outcome of such pursuits in an easily visible manner



The greeting of "goanzen ni!" is being localized and used by staff at overseas business sites; Chinese staff have translated it into Chinese, while Singaporean staff modified it into "GO! ANZEN-NI!"

## Production Process Reforms That Improved Our Safety Assurance Measures (best practices at the Chiba and Iseaki plants)

The Chiba Plant has installed fences around certain machinery to prevent accidents in which workers are pinned down by or caught in it. These fences are equipped with a mechanism that prevents access to machinery while it is running. The plant formed a dedicated project team aimed at reclaiming productivity without compromising this new safety measure. The team has succeeded in reclaiming and achieving further improvements in productivity.

Having identified a variety of major risks in loading and unloading operations employing forklifts, the Iseaki Plant has been promoting the automation of on-premises logistics and the installation of automated storage systems. Ultimately, the plant aims to ensure that forklifts never cross pathways used by plant staff who are on foot. Conducted as a part of production process reforms aimed achieving drastic improvement.

## S Social Contribution Activities



Remaining true to our founders' spirit,  
we will contribute to social development via value creation.

### Denka Group Social Contribution Policies

Denka aims to proactively play a positive role in society as a good corporate citizen. With this in mind, the Company hereby establishes its basic policies with regard to social contribution, clarifying the roles and responsibilities all Denka Group members must fulfill in terms of efforts to facilitate the sound and sustainable development of society.

Since its founding in 1915, the Denka Group has been pursuing the possibilities of chemical technologies. Through this pursuit, the Group has endeavored to fulfill its unchanging mission as a manufacturer in an effort to contribute to the advancement of human civilization and the development of society.

For more than a century, the Group has accumulated strengths in such fields as the generation of clean energy and the development of energy-saving technologies. The Group also boasts an array of products, services and solutions capable of contributing to social development and environmental preservation. The Group is committed to fulfilling its

#### Examples of Fiscal 2017 Initiatives

##### 1. Educational, academic and cultural development

Hosted plant tours and experimental chemical classes and participated in Summer Holiday Chemical Experiment Show for Children  
Provided internship programs and maintained a scholarship system  
Provided assistance to on-demand concerts presented by the Fureai Trio

##### 2. Community contribution and the preservation of the global environment

Engaged in ongoing initiatives aimed at supporting the reconstruction of areas affected by the Great East Japan Earthquake and operated "Denka Farm" (Minami Sanriku-cho)

Provided assistance to the reconstruction of areas affected by the extraordinarily heavy rainfalls in northern Kyushu and the massive fire that engulfed streets north of Itoigawa City's main train station

Participated in various local events and activities, including cleanup campaigns, held in areas near business sites

Renewed our naming rights agreement pertaining to the DENKA BIG SWAN STADIUM

Sponsored J-WAVE Green Casting Day aimed at facilitating the use of environment-friendly energy sources

Co-sponsored the Satoyama Forum, a community event themed on discussing natural farming methods and held by "Noranbo Mura," an NPO aimed at promoting self-contained cooperative farming

##### 3. Assistance to health promotion, contribution to people's well-being and facilitation of sports activities

Donated Ebola virus rapid diagnostic test kits to the Democratic Republic of Congo (2017 and 2018)

Co-hosted Toyokalon Wigs for Wonderful Women (Washington, U.S.A.)

Offered a venue for RELAY FOR LIFE Japan 2017

Provided assistance to facilities for people with disabilities (Ecomira Koto, a recycling facility operated by the NPO Chikyu-Sen Club)

Became an official sponsor of the Japan Association of Athletics Federations

Supported the NIIGATA Albirex (female basketball team and male football team)

Offered a venue for the 3rd round of the junior football festival  
Assisted the ALBIREX NIIGATA Singapore in its CSR activities involving visits to a home for the elderly and childcare centers

social responsibilities by employing these strengths.

To this end, the Group will leverage its business network around the globe as a platform for social contribution. At the same time, the Group will focus on developing an environment that better encourages Group employees to take part in the following three initiatives while raising their social contribution awareness.

##### 1. Educational, academic and cultural development

The Group will nurture young people, among whom the manufacturing industry's future leaders may be found, while proactively providing assistance to forward-looking academic pursuits and research activities. Simultaneously, the Group will contribute to cultural development

##### 2. Community contribution and the preservation of the global environment

Paying respect to diverse cultures and customs in countries around the world, the Group will take a community-rooted approach in its efforts to promote the sound development of local societies in which it operates. Moreover, the Group will voluntarily implement initiatives aimed at preserving the global environment while sparing no effort to enhance the efficiency of its use of limited resources, with the aim of contributing to the realization of a sustainable society.

##### 3. Assistance to health promotion, contribution to people's well-being and facilitation of sports activities

The Group will facilitate sports activities, provide assistance to people's health promotion efforts and contribute to their well-being. By doing so, the Group will help improve people's quality of life in a way that leverages its core business functions associated with healthcare and the living environment.

### Denka Seiken's Ebola Virus Rapid Diagnostic Test Kits Donated to the Democratic Republic of Congo

Denka Seiken Co., Ltd. donated Ebola virus rapid diagnostic test kits to the Democratic Republic of Congo (DRC) immediately after the Ebola virus outbreak emerged in that country on May 11, 2017. This move was intended to meet a request that was made by the DRC's Ministry of Public Health and relayed via the Japan International Cooperation Agency (JICA) to Dr. Ayato Takada, a professor at Hokkaido University's Division of Global Epidemiology, Research Center for Zoonosis Control, who is acting as Denka Seiken's research partner. Co-developed by Dr. Takada and Denka Seiken, these

diagnostic test kits are capable of confirming Ebola infection within approximately 15 minutes without using any specific medical facilities.

On May 8, 2018, Denka Seiken received a similar request from the ministry and donated these products again. Looking ahead, we will strive to prevent the epidemic of infectious diseases, a universal issue the international community is now confronting.

### Providing a Venue for RELAY FOR LIFE Japan 2017 Niigata, a Charity Event Aimed at Promoting a Remedy to Cancer and Encouraging Patients

On August 26 and 27, 2017, RELAY FOR LIFE Japan 2017 Niigata was held at DENKA BIG SWAN STADIUM in Niigata City. As part of the nationwide RELAY FOR LIFE Japan campaign, this event was aimed at promoting a remedy to cancer and encouraging cancer patients through a 24-hour walking relay race undertaken by teams consisting of patients themselves, their families and supporters. Similar events were held in approximately 50 locations across Japan in 2017, and Denka, fully agreeing with the campaign's objective, made the stadium available as a venue for one such event held in Niigata.

The event also provided attendees with a variety of programs aimed at raising their awareness of the importance of cancer checkups and showcasing cutting-edge treatment methods. Finally, all attendees walked



RELAY FOR LIFE Japan 2017 Niigata held at DENKA BIG SWAN STADIUM

shoulder to shoulder the full length of the 400-meter track of the stadium, demonstrating their determination to someday create a society in which nobody will succumb to cancer.

### Supporting CSR Activities Undertaken by ALBIREX NIIGATA Singapore

In 2015, Denka Chemicals Holdings Asia Pacific Pte. Ltd. signed a CSR partnership agreement with ALBIREX NIIGATA Singapore, a professional football team, and since then has provided assistance to the team's CSR activities.

The ALBIREX NIIGATA Singapore cheerleaders pay visits to local childcare centers and junior high schools to host cheer dance clinics, thereby interacting with children and youth. On December 22, 2017, they paid a first visit to "Gift of Love Home," a home for the elderly, and conducted a cheer dance session specifically designed to enable elderly people, even those using wheelchairs, to participate and enjoy dancing.



The ALBIREX NIIGATA Singapore cheerleaders performing a cheer at a home for the elderly in Singapore

### Supporting the Restoration of Areas Affected by Major Disasters

#### Initiatives to Support the Reconstruction of Streets North of Itoigawa City's Main Station

On December 22, 2017, a symposium was held at the Itoigawa Civic Hall to discuss the reconstruction of streets affected by a massive fire that engulfed a block north of Itoigawa City's main station. Attending the event, a representative from Denka was honored to receive a commendation certificate from the mayor of Itoigawa City in recognition of the Company's contribution to reconstruction efforts.

After the massive fire devastated the block on December 22, 2016, the Company was one of the local corporations that immediately took action to assist in reconstruction efforts, dispatching a total of 70 volunteer employees from its Omi Plant in addition to providing aid supplies and donations. The Company also raised funds for further donations via a charity concert while accepting debris from affected sites as part of its resource recycling operations.

Going forward, we will help the local government promote town development planning aimed at restoring and vitalizing affected streets as we aim to remain a contributor to the reconstruction of the community.



A representative from Denka attending a symposium and receiving a commendation certificate from the mayor of Itoigawa City

#### "Denka Farm" Initiative in Minami Sanriku-cho, Miyagi Prefecture

On October 21, 2017, we hosted a harvest celebration at "Denka Farm," inviting representatives from a local farmers' association in Minami Sanriku-cho, Miyagi Prefecture.

Denka Farm consists of testing farmland and was established based on suggestions incidentally proposed by staff at Denka's Tohoku Branch in the course of ongoing discussion aimed at soliciting ideas for initiatives to support the reconstruction of areas affected by the Great East Japan Earthquake. Having assisted in the restoration of farmland that suffered salt damage due to tsunami via the donation of Denka's underground drainpipes and fertilizers, the branch has cultivated close ties with members of the farmers' association. Borrowing a portion of farmland owned by the association, we opened Denka Farm.

In June 2017, we planted 600 sweet potato seedlings at the farm. Since then, we have weeded, sprayed herbicides and done other farm work in collaboration with the association members.

After celebrating the harvest with us, some local farmers remarked "We'll be looking forward to meeting you again next year." Going forward, we will continue to operate Denka Farm while remaining committed to giving back to the people in the Tohoku area by providing assistance in the restoration of once-devastated farmland and local farmers' efforts to reinstate their operations.

# G Corporate Governance

To maintain the trust of society, we will seek greater transparency and ensure integrity in all our endeavors.

## A Message from an Outside Director

### Outside Directors' Roles Are Ever More Important in the Face of Rising Calls for Robust Growth Strategies and Sophisticated Governance

Currently, Denka's Board of Directors includes three outside directors, each of whom boasts extensive business experience in various fields. I have long served at a French-capital chemical company myself in addition to holding the office of outside member of the Audit & Supervisor Board at a pharmaceutical company. In the latter position, I have engaged in the onsite auditing of subsidiaries in Europe, the United States and Asia. This exposure made me acutely aware of the importance of winning the understanding of increasingly diverse stakeholder groups, including shareholders, via the establishment of a management structure that is transparent and rational and based on a global perspective.

#### Advances in Denka's Efforts to Ensure More Robust Governance

Over the last several years, Denka has seen significant advances in its efforts to upgrade corporate governance functions. Also, the Company's Board of Directors meetings boast an open atmosphere. Outside directors are given sufficient explanations about agenda items to be submitted to the board prior to the meetings, while all directors and Audit & Supervisory Board members attend the monthly "D&A Round Table" meetings to discuss management issues of particular importance. Moreover, the Company recently established the Management Advisory Committee. These are but few examples of Denka's efforts to provide outside directors with greater opportunities to engage in constructive discussion and contribute their insights, which the Company values and proactively incorporates. In addition to these noteworthy developments, Denka began holding separate meetings exclusively for outside directors and outside members of the Audit & Supervisory Board on a quarterly basis. This move helps facilitate the exchange of opinions among these directors while ensuring that their feedback is accurately relayed to top management.

I also expect that, going forward, Denka will move on to develop even more sophisticated governance functions. The Denka Group boasts a variety of

Yasuo Sato  
Outside Director



operations that range from the production of traditional fertilizers to the manufacture of vaccines, which support the Company's Life Innovation Division, while expanding into such regions as Asia, the United States and Europe as well as Africa. Accordingly, Denka is focused on pushing ahead with the development of a management system capable of exercising robust governance over its business units in regions around the globe. I believe that as part of these efforts, Denka should welcome diverse human resources as management members to boost corporate growth. Looking ahead, the Company also needs to take on the challenge of incorporating an even broader range of opinions voiced by people with different thinking and cultural backgrounds regardless of their gender, race and nationality. I expect that, of course, Denka will steadily work to introduce various measures to this end.

#### Helping Achieve Growth in both Corporate Value and Profitability

In April 2018, Denka launched a new management plan. I anticipate that this ambitious plan will help Denka achieve growth and enhance its corporate value over the medium to long term. I also believe that in order for Denka to accomplish the plan's objectives in a rational manner, the Company must promote reforms in terms of its corporate culture and employee awareness. I think that outside directors can provide Denka with useful input in this regard because they have a variety of experience outside the Company.

Along with developing sophisticated governance systems, properly addressing environmental and social issues is essential. This will also lend support to Denka's drive toward long-term corporate growth. I am therefore determined to fulfill my role as an outside director in terms of helping the Company pursue an ESG-oriented management approach that contributes to the creation of a sustainable society. To this end, I will engage in the robust supervision of management rather than staying quiet to preserve the status quo. I ask all stakeholders, including shareholders, for their continued support of our endeavors.

## Strengthening Corporate Governance

### Basic Approach to Corporate Governance

In order to fulfill the expectations and trust of its many stakeholders, including shareholders, customers, local society, and employees, based on "The Denka Value" (corporate philosophy), which serves as the cornerstone for all the corporate activities undertaken by the Denka Group, the Company strives to strengthen its business foundation by improving its earnings power and expanding the scope of operations while also working to improve corporate value by making every effort to continue being a company that can win the trust and support of society.

The Company considers corporate governance to be the bedrock on which the above rests, and so we have striven to strengthen governance, in order to fulfill the responsibilities we owe to all our stakeholders and ensure the transparency and soundness of our management.

### Board of Directors (met on 13 occasions in fiscal 2017)

To realize the Company's corporate philosophy, "The Denka Value," the Board of Directors monitors and supervises major operational decision making and the execution of business duties by executive officers, based on strategic and management planning. The Board of Directors as a whole appoints candidates for director in line with the standards for the appointment of both internal and outside directors, based on the belief that it is important to maintain a balanced composition via the incorporation of people with a variety of expertise, experiences, and skills.

In October 2015, we began holding exchange meetings for all directors and Audit & Supervisory Board members. This move was aimed at facilitating open, lively and constructive discussion, the exchange of opinions, robust information sharing and close collaboration between directors, outside directors and Audit & Supervisory Board members. In October 2017, moreover, we rebranded these meetings as the "D&A Round Table" in line with initiatives to facilitate open and constructive discussion while placing stronger focus on making ongoing progress over the long term.

We have also established the Management Advisory

Committee, with all outside directors and all outside members of the Audit & Supervisory Board as well as Chairman and President serving as committee members. Having positioned governance over the nomination of and remuneration for key personnel as an essential component of Denka's governance functions, the establishment of this body is intended to provide a place for discussing such matters as important management challenges and incorporating diverse opinions and advice from outside directors and outside members of the Audit & Supervisory Board, with the aim of ensuring the transparency and objectivity of management decisions.

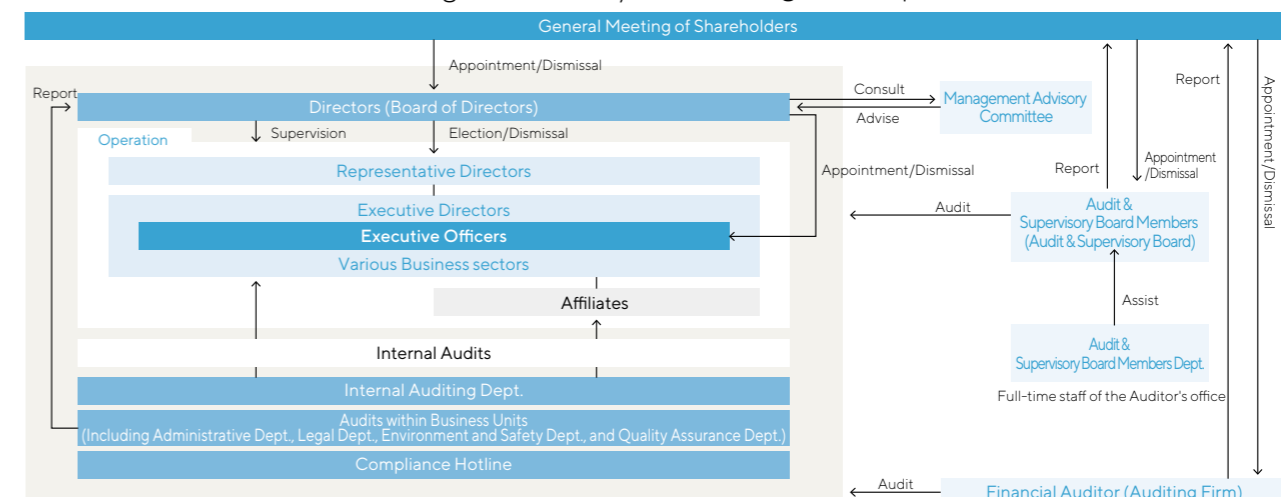
In addition, we have abolished the positions of senior managing and managing director so that all directors who supervise and monitor business execution engage with their peers on equal footing at Board of Directors meetings. By limiting the term of office for directors to one year, we also intend to ensure the flexibility to assess the adequacy of each director at every General Meeting of Shareholders.

### Concepts on the Appointment of Directors

To promote Denka Value-Up, a management plan aimed at practicing The Denka Value, our corporate philosophy, we are strengthening our management structure supported by directors and executive officers in addition to upgrading our governance systems and supervisory functions.

Director candidates are nominated from those who have abundant experience and a strong track record in Denka's business divisions and are equipped with sufficient knowledge and specialist expertise for the director position. Outside director candidates are nominated from those who boast extensive knowledge backed by abundant business experience as well as distinctive strengths in their area of specialty so that they can bring their insights on how to achieve sustainable growth and enhance corporate value. With regard to the overall composition of board members, we believe that maintaining the balanced composition via the incorporation of people with diverse knowledge, experience and competencies is important.

We also aim to maintain the sufficient number of independent outside directors to ensure that they account for at least one third of director membership. Currently, the Company's Board of Directors achieves this targeted composition.



### Audit & Supervisory Board (met on 15 occasions in fiscal 2017)

The Audit & Supervisory Board aims to act in accordance with their fiduciary responsibilities to shareholders. To this end, the Audit & Supervisory Board members work with the support of the full-time staff at the Audit & Supervisory Board Members Department, whose independence from management is ensured, to conduct audits of the execution of directors' duties, internal control, business operations and accounting by exercising statutory rights that include requesting reports on the Company's business, investigating the status of business operations and accounting, and proposing the appointment and dismissal of and revisions in remuneration for an external auditing firm.

In addition, in light of the roles and responsibilities of the Audit & Supervisory Board, the Company appoints candidates for Audit & Supervisory Board members based on the decision that at least one candidate should be equipped with expertise in finance and accounting.

### Outside Directors and Outside Members of the Audit & Supervisory Board

Regarding outside directors and outside members of the Audit & Supervisory Board, the Company selects candidates based mainly on practical considerations, such as whether we can expect the candidate to contribute to an increase in the corporate value of the Company as an independent outside director or outside member of the Audit & Supervisory Board. With this in mind, the Company has also defined its own standards of independence, in accordance with the requirements for independence stipulated in the Companies Act, in addition to the standards for independence defined by the Tokyo Stock Exchange and other prevailing criteria.

We strive to offer a supportive environment to outside directors and outside members of the Audit & Supervisory Board to help them enhance their understanding of Denka's operations and better fulfill their roles in the Company's pursuit of sustainable growth and greater corporate value. Specifically, we invite them to join facility and plant tours while holding presentation meetings twice a year for them to help them understand Denka's short-, medium- and long-term policies on its business operations and R&D activities.

### Management Advisory Committee (met on three occasions in fiscal 2017)

We aim to secure the transparency and objectivity of management decisions by ensuring that the Board of Directors is exposed to diverse opinions and advice from outside directors and outside members of the Audit & Supervisory Board with regard to such important management matters as governance issues, including nomination and remuneration. To that end, in October 2017 we established the Management Advisory Committee, with all five outside directors and outside members of the Audit & Supervisory Board as well as Chairman and President serving as committee members.

In fiscal 2017, the committee was consulted by and gave advice to the Board of Directors with regard to matters associated with remuneration for directors and executive officers and changes in the positions of these individuals as well as initiatives under the Denka Value-Up management plan.

### D&A Round Table (met on 12 occasions in fiscal 2017)

In order to facilitate in-depth discussions regarding management matters that are of particular importance, the D&A Round Table is organized every month as a forum for bringing together all outside directors and outside Audit & Supervisory Board members and all internal directors and Audit & Supervisory Board members, to encourage engagement in free, open-minded, constructive discussions, exchange of opinions and information, and strengthening of cooperation.

### Outside Director Liaison Meetings (met on three occasions in fiscal 2017)

Attended only by outside directors and outside members of the Audit & Supervisory Board, these liaison meetings are aimed at ensuring that these individuals engage in the active exchange of opinions on and share their understanding of the status of the Company's corporate governance and business operations.

### Director Remuneration

We have set remuneration for each director based on their roles and responsibilities within the limit of the total amount approved by the General Meeting of Shareholders. The representative directors draft the remuneration plan and the Board of Directors decides on the content of remuneration after receiving advice and recommendations from the Management Advisory Committee.

Remuneration for directors consists of a monthly fixed portion (paid to all directors) as well as a performance-based portion and a share-based portion (both of which are not paid to outside directors).

The value of the performance-based portion is determined in step with consolidated operating income for each fiscal year. However, this portion may not be paid or be decreased in cases where consolidated operating income did not reach a certain amount or the Company was found to be involved in compliance violations and other significant misconduct.

A share-based portion was newly introduced in June 2017. This move is intended to ensure that directors share interests and risks associated with stock price fluctuations with the Company's shareholders. By doing so, we aim to help directors have a strong sense of purposefulness toward achieving medium- to long-term growth in corporate performance and corporate value.

## Maintaining a Strict Stance on Compliance with Laws and Corporate Ethics

### Compliance

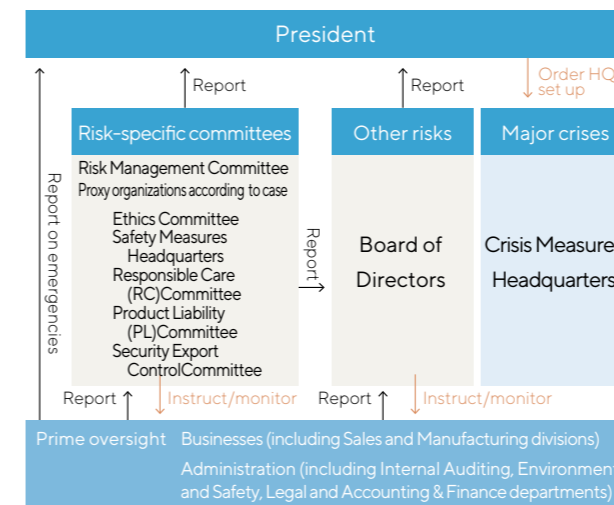
Compliance is essential for sustainable growth. We accordingly adhere to internal rules and government legislation and refrain from acts that violate moral and ethical norms. The Denka Group Ethics Policy was established to codify Groupwide standards of conduct, while the Ethics Committee, chaired by the president, oversees the overall compliance structure and reports to management, thereby ensuring adherence to this policy.

Moreover, the Internal Auditing, Legal, Environment

and Safety, Quality Assurance, Intellectual Property and other departments ensure thorough compliance in their respective areas of specialty. In addition, we have been conducting compliance surveys and operational audits for Group companies since fiscal 2011. Expanding the scope of entities subject to such surveys and audits, Denka's staff at specialist departments conducts on-site auditing to accurately assess the status of compliance and help maintain strict compliance. We also focus on providing employees with compliance education under an initiative promoted by the Career Value-Up Center.

### Risk Management

An essential part of corporate governance is understanding the diverse and numerous risks inherent in corporate activities and exerting proper risk control. In general, each business unit is responsible for identifying and managing specific risks. For environmental, safety, product liability and export control issues that affect the entire Company, we have in place special sections and permanent committees to handle matters.



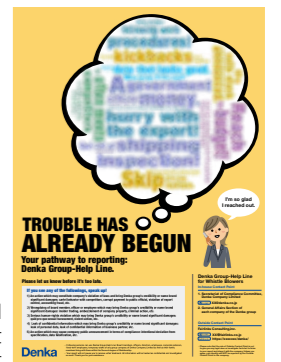
### Compliance Hotline System

Previously, the Company had in place a compliance hotline system based on the Denka Group Ethics Policy. However, this system was found to be insufficient in terms of its capacity for accepting tips from non-Japanese speakers and handling workplace harassment incidents, which often place excessive psychological burdens on whistleblowers. Because of this, the number of reports registered with the system has been low. Aiming to create a more robust system capable of accepting and properly handling a broad range of compliance-related reports within the Group from employees around the globe, Denka has established new rules on whistleblowing. These rules were drafted based on Principle 2-5 (Whistleblowing) of Japan's Corporate Governance Code and the December 2016 guidelines formulated by the Consumer Affairs Agency and discussed at both the Management Committee and the Board of Directors before finalization. In line with these rules, we have thus upgraded our conventional compliance hotline system into the Denka Group Helpline for all Group members. In general, these rules mandate the helpline to expand the scope of eligibility for individuals making

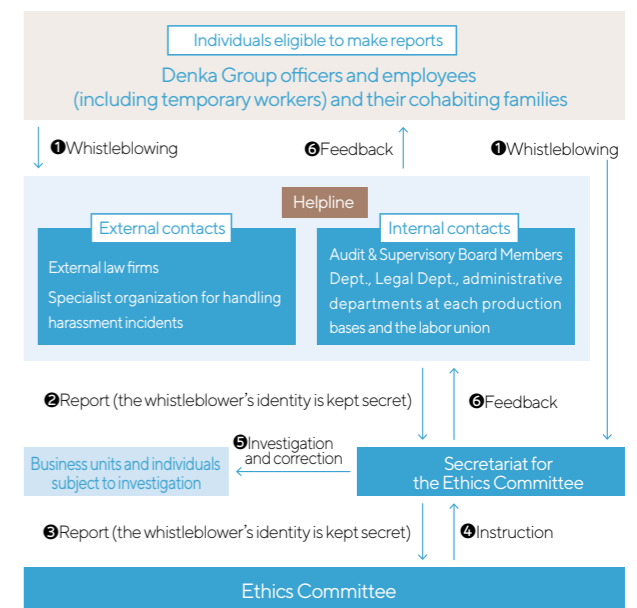
reports, accepting reporting from temporary workers and cohabiting families of officers and employees serving Group companies in Japan and overseas. Moreover, we have appointed external contacts, including law firms, capable of accepting reports made in Japanese, English and Chinese, with the aim of removing barriers that may prevent overseas incidents from being quickly reported. In addition, we have appointed an external specialist organization as a contact for handling harassment incidents.

Whenever a whistleblower brings tips revealing the violation of the Denka Group Ethics Policy by Denka Group officers and employees, a secretariat for the Ethics Committee will register and investigate the incident based on the aforementioned rules in addition to carefully ensuring that the whistleblower is not treated detrimentally and that the content of whistleblowing is kept secret. The secretariat will thus take corrective action and implement measures to prevent recurrences in a swift and proper manner while giving feedback to the whistleblower.

We are striving to let all Denka Group officers and employees and their families know the existence of the helpline and help them raise their compliance awareness. To this end, the Ethics Committee has posted a message themed on whistleblowing written by top management on the intranet portal and in-house newsletters. The committee has also prepared posters as well as handbooks and cards to be carried by these officers and employees to ensure that they are informed about how to contact and use the helpline.



An informative poster and handbook telling employees about the helpline and how to use it



Note: This is the process at the Group's companies in Japan.



# G Directors and Audit & Supervisory Board Members (as of June 2018)



**1** Representative Director, Chairman  
**Shinsuke Yoshitaka**  
(Born February 1, 1951)

#### A Message to Shareholders

With good faith and determination, as laid out in the Company's corporate philosophy as well as in the Denka Principles, I will make every effort to boost corporate value. In addition, as Chairman of the Board of Directors, I will endeavor to lead the Board of Directors in a way that is sound and transparent, taking into account the perspective of shareholders and investors.

#### Reasons for Appointment

Subsequent to taking on responsibility for management strategy, the medical business, accounting and finance, and investor relations and corporate communications, Mr. Shinsuke Yoshitaka promoted the "Denka100" management plan as Representative Director, President. In addition to boasting a wealth of experience and results as a manager, he serves as the Chairman of the Board of Directors and as the Company's Representative Director drawing on his deep knowledge and understanding of the Group. Because he was thus considered capable of handling decision-making on important business issues and supervising the business execution of directors and executive officers, the Company selected him as a director candidate and obtained approval for his appointment at the 159th Ordinary General Meeting of Shareholders.

**2** Representative Director, President & CEO  
**Manabu Yamamoto**  
(Born March 31, 1956)

#### A Message to Shareholders

Under the corporate philosophy, "The Denka Value," in order to meet the expectations and trust of all stakeholders, I aim for the Company to achieve sustainable growth through the further specialization of its business structure and productivity innovations in addition to being a sound company that fulfills its social responsibilities.

#### Reasons for Appointment

Through work experience at overseas subsidiaries and many years of responsibility for the electronics materials business division, Mr. Manabu Yamamoto possesses an international viewpoint and relevant operational experience. Having integrated new business strategies and accounting and finance strategies across the entire Denka Group as the executive responsible for management strategy as well as the Accounting & Finance, Investor Relations and CSR & Corporate Communications depts., Mr. Yamamoto currently serves as Representative Director and President & CEO. He boasts rich experience and impressive track record in company administration. Because he was thus considered capable of handling decision-making on important business issues and supervising the business execution of directors and executive officers, the Company selected him as a director candidate and obtained approval for his appointment at the 159th Ordinary General Meeting of Shareholders.

**3** Director  
**Mitsukuni Ayabe**  
(Born September 23, 1952)

#### A Message to Shareholders

Promoting the new "Denka Value-Up" management plan to all employees, I will "create a more trusted company" by ensuring thorough awareness of social contribution and compliance as well as by working toward our targets.

#### Reasons for Appointment

Subsequent to taking on the management of research and development and overseas subsidiaries and responsibility for medical business, accounting and finance, and investor relations and corporate communications, Mr. Mitsukuni Ayabe directed the overall technical divisions as the general executive for planning and development while assisting the President as Executive Vice President and Chief Operating Officer. Currently, Mr. Ayabe is in charge of the Life Innovation Division and supports strategies in the growing healthcare field. Because he was thus considered capable of handling decision-making on important business issues and supervising the business execution of directors and executive officers, the Company selected him as a director candidate and obtained approval for his appointment at the 159th Ordinary General Meeting of Shareholders.

**4** Director  
**Norihiro Shimizu**  
(Born October 2, 1955)

#### A Message to Shareholders

Through continuous innovation leveraging the comprehensive capabilities of the Group and by implementing a business strategy that targets individual businesses in a way that strikes a balance between profitability and sustainability, I am committed to ensuring sustainable growth and improving corporate value.

#### Reasons for Appointment

Mr. Norihiro Shimizu has ample practical experience, including oversight of research and development activities for many years in the fields of polymers and electronic materials. Currently, as Chief Scientific Officer and Chief R&D Officer, he is responsible for all research and development operations, and for business strategy, including development of next-generation products and of new businesses. He thus boasts deep expertise and experience in research and development operations. Because he was thus judged as capable of handling decision-making on important business issues and supervising the business execution of directors and executive officers, the Company selected him as a director candidate and obtained approval for his appointment at the 159th Ordinary General Meeting of Shareholders.

**5** Director  
**Kenji Nakano**  
(Born November 17, 1955)

#### A Message to Shareholders

I realize that achieving the three visions in "Denka Value-Up" will lead to corporate growth and development, and, as I work toward this goal, I will divide our tasks into those we can execute immediately, those that require time to implement, and those where we must lay the foundations for future implementation.

#### Reasons for Appointment

Through work experience at plants and subsidiaries, and many years of responsibility for management divisions such as general affairs, legal, and HR divisions, and as the Representative in China, Mr. Kenji Nakano has amassed an abundance of operational experience. Currently, Mr. Nakano is continuing to promote strengthening risk management and compliance systems as the executive responsible for compliance, as well as overseeing general affairs, legal matters, personnel affairs, internal auditing and other areas, in addition to being in charge of the Infrastructure Social Solutions Division. Because he was thus judged as capable of handling decision-making on important business issues and supervising the business execution of directors and executive officers, the Company selected him as a director candidate and obtained approval for his appointment at the 159th Ordinary General Meeting of Shareholders.

**6** Outside Director  
**Yasuo Sato**  
(Born September 30, 1942)

#### A Message to Shareholders

In a spirit of rationality and fairness, I am determined to contribute to the sustainable, sound growth of the Company and boost corporate value from a global, medium- to long-term perspective.

#### Reasons for Appointment

Mr. Yasuo Sato has gained rich experience and great insight as a manager through his many years of involvement in corporate management. His career included serving as the President of Air Liquide Japan Ltd. He also has rich international experience, including serving as a vice president at global enterprises. Expecting that Mr. Sato will employ his expertise and contribute valuable insights into a broad range of management issues, including Denka's global expansion strategies, the Company has thus selected him as an outside director candidate and obtained approval for his appointment at the 159th Ordinary General Meeting of Shareholders.

**7** Outside Director  
**Akio Yamamoto**  
(Born December 2, 1951)

#### A Message to Shareholders

Viewing the Company's businesses from a historical perspective of our industry and a global perspective, I am committed to maintaining a strong stance of fairness, and contributing to corporate operations and increasing corporate value.

#### Reasons for Appointment

Mr. Akio Yamamoto has rich experience and great insight as a manager in Japan and overseas through his involvement in corporate management for many years. His career has included serving as an Executive Officer of Mitsui & Co., Ltd. and the Representative Director and President of Mitsui & Co. Plastics Ltd. He also has rich international experience, including serving as a vice president at global enterprises. Expecting that Mr. Yamamoto will employ his expertise and contribute valuable insights into a broad range of management issues, including Denka's global expansion strategies, the Company has thus selected him as an outside director candidate and obtained approval on his appointment at the 159th Ordinary General Meeting of Shareholders.

**8** Outside Director  
**Tatsutsugu Fujihara**  
(Born November 23, 1952)

#### A Message to Shareholders

While aiming to "boost corporate value in the true sense," I am determined to contribute to the creation of an organizational culture that can properly demonstrate the "ability to keep itself pure."

#### Reasons for Appointment

Having worked in corporate management at financial institutions for many years, Mr. Tatsutsugu Fujihara has rich experience and great insight as a manager and possesses advanced insights regarding corporate finance. Expecting that Mr. Fujihara will employ his expertise and contribute valuable insights into a broad range of management issues, the Company has thus selected him as an outside director candidate and obtained approval on his appointment at the 159th Ordinary General Meeting of Shareholders.

**9** Audit & Supervisory Board Member  
**Shohei Tamaki**  
(Born June 18, 1952)

#### A Message to Shareholders

In addition to the obligation of legality of execution of business duties by the Board of Directors under the Companies Act, I aim to focus auditing activities on ensuring reasonable and effective (valid) execution of business duties under the "Denka Value-Up" concept.

**10** Audit & Supervisory Board Member  
**Masanori Sakamoto**  
(Born September 24, 1956)

#### A Message to Shareholders

In order to gain the trust of all stakeholders, I aim to monitor the legality and validity of the day-to-day execution of business duties based on the Companies Act and the precepts of the corporate governance code.

**11** Outside Audit & Supervisory Board Member  
**Tsunehiro Sasanami**  
(Born January 28, 1952)

#### A Message to Shareholders

Drawing on my experience as a lawyer, I audit the execution of business duties and operations of the Board of Directors by asking whether thorough compliance is achieved and whether the corporate governance system is working.

**12** Outside Audit & Supervisory Board Member  
**Toshio Kinoshita**  
(Born April 12, 1949)

#### A Message to Shareholders

As one of the outside Audit & Supervisory Board members, with the perspective of a Certified Public Accountant specialized in accounting, I help to ensure that standards of corporate governance at the Company are properly upheld, and that strict compliance is maintained.

# Outline of the “Denka Value-Up” Management Plan (fiscal 2018 – 2022)

## To Become a Specialty-Fusion Company

Having formulated Denka Value Up, we have re-adjusted our focus to the following factors essential to sustainable corporate growth: “placing the utmost priority on safety”; “giving due consideration to environmental concerns”; “nurturing and better utilizing human resources”; and “making social contributions.” Having positioned these creeds as fundamental components of its corporate philosophy, Denka now aims to achieve significant growth at home and abroad and, to this end, execute its new growth strategies designed to help it to become a “Specialty-Fusion Company” capable of securing both “Sustained Growth” and “Sound Growth.” For more details, please also refer to the following materials.

[http://www.denka.co.jp/eng/news/pdf/20171108\\_valueup\\_e.pdf](http://www.denka.co.jp/eng/news/pdf/20171108_valueup_e.pdf)

<http://www.denka.co.jp/eng/corporate/plan/pdf/valueup.pdf>

## Growth Vision

### 1 Become a Specialty-Fusion Company with a Strong Global Presence

Become a company that boasts outstanding global competitiveness backed by a robust portfolio of specialty businesses and products along with its technological strengths and human resource capabilities

### 2 Maintain Sustained Growth by Significantly Enhancing Productivity through Innovative Processes

Strive to achieve a drastic improvement in productivity and, to this end, focus on truly essential operations and introduce innovative processes through the utilization of IoT, AI and other cutting-edge digital technologies, thereby securing the ability to secure sustained growth regardless of external conditions

### 3 Secure Sound Growth through Work Style Reforms

Develop a working environment that is inclusive of diverse working styles, with the aim of better collaborating with employees to pursue stakeholder happiness and to ensure sound corporate growth

#### Disseminating Concepts behind Denka Value-Up to Unify All Denka Group Members toward the Plan's Goal

The Denka Value-Up Promotion Department is striving to ensure that the growth vision and strategies under the “Denka Value-Up” management plan are well understood by all employees, who range from back office workers to operators at production frontlines. To this end, the department is engaged in the following initiatives.

##### - Preparing videos

In January 2018, we prepared and released a video announcing the launch of Denka Value-Up in an attempt to enhance corporate communications targeting both in-house and external audiences. A first for us, the video is crafted to best disseminate the underlying concepts of the management plan and features President Yamamoto delivering a message of strong determination regarding achieving the plan's goals. Looking ahead, plans call for preparing another video for an exclusively in-house audience twice a year over the course of the plan's five-year period.

##### - Value-Up Sessions (round-table dialogue)

We host round-table dialogue sessions, inviting managers from production bases and various departments to voice their opinions on present issues that must be addressed if we are to realize the growth vision, propose initiatives to this end and explain their vision of the ideal Denka once all goals have been met. In addition to featuring a summary of each dialogue session in an in-house wall-mounted newspaper, we compile the content of these sessions into a special booklet to be distributed to all business units as we aim to help employees better understand Denka Value-Up and foster a sense of ownership toward the realization of the plan.

##### - Posters featuring departmental targets

As part of our efforts aimed at ensuring that the growth vision is embraced by all business units, we have prepared posters for each department. These posters feature both the Company's growth vision and department-specific targets being set in aid of accomplishing said vision.

##### - Process reform initiatives and Denka Value-Up presentation meetings

Aiming to facilitate the introduction of innovative processes, one of our two growth strategies, we hold presentation meetings to draw attention to business units that earned success in this endeavor. Horizontally rolling out best practices to each business site, we are striving to ultimately realize overarching innovation in the Company's operational processes.

##### - In-house intranet portal

We disseminate information about the status of process reforms by updating topics on relevant initiatives on our in-house intranet portal.

## Growth Strategies

### 1 Business Portfolio Shift

#### ① Accelerate growth of specialty businesses

We will focus our management resources on the following three priority fields, with the aim of achieving numerical targets through proactive strategic investments (e.g., execution of M&A and business alliances, reinforcement of our R&D structure and reallocation of human resources).

#### ② Specialize our key operations

To secure resilience to changes in external conditions, we will work to increase the “specialty grade” ratio in the product lineup while shifting our focus to the solution business.

#### ③ Redefine the positioning of the commodity businesses

We are redefining the positioning of our commodity businesses that are intrinsically unsuitable for specialization, to this end restructuring strategies for these businesses.

### 2 Introduction of Innovative Processes

Rather than adhering to precedent, we proactively work to introduce cutting-edge ICT technologies; focus on truly essential operations and the standardization of our processes to achieve drastic improvements in productivity; create new businesses; execute work style reforms; and promote workforce diversity.

#### 1. Production process reforms

- Restructure our production facilities into ICT-based next-generation smart factories
- Build a robust, overarching information platform capable of managing all data on a real-time basis
- Realize manufacturing operations with greater productivity and superior stability

#### 2. R&D process reforms

- Identify R&D themes oriented toward specialization
- Develop R&D assistance systems employing ICT
- Nurture diverse human resources by providing them with strategically designed career paths

#### Operational process reforms

- Facilitate active in-house collaboration through the introduction of futuristic office functions
- Enhance operational productivity (streamline routine work, improve the efficiency of meetings, etc.)
- Develop a location-free working environment
 

Work style reforms/Diversity promotion
- Shift our focus from “quantity” to “quality” in terms of working hours
- Help employees enhance their quality of life
- Create an innovation-oriented organization by welcoming diverse human resources and helping them achieve success

#### Healthcare (EBITDA ratio: 30%)

##### Policy:

In addition to illness prevention and early diagnosis, we are expanding into cancer remedy and gene alteration analysis to help enhance people's quality of life.

##### Primary themes:

Diagnostic reagents to measure lipoprotein subclasses, services aimed at facilitating genome-based cancer treatment (particularly the selection of candidate drugs for molecular-targeted therapy), methods for mass-producing oncolytic viruses, and technologies to manufacture proteins using the tobacco plant

#### The environment and energy (EBITDA ratio: 20%)

##### Policy:

We employ such core technologies as cutting-edge inorganic materials in product development, with the aim of better satisfying the latest needs for solutions that help achieve zero emissions, support autonomous driving systems and assist in other technological pursuits aimed at creating a clean and safe future society.

##### Primary themes:

Lithium ion secondary battery materials, films as alternatives for coatings and materials for surface decoration of interiors

#### High-value-added infrastructure (EBITDA ratio: 10%)

##### Policy:

We strive to meet high-profile infrastructure development needs in countries around the world through the provision of cutting-edge materials and solutions.

##### Primary themes:

Promote global expansion via M&A, the marketing of products tailored to meet region-specific needs and cutting-edge infrastructure diagnosis services employing ICT technologies

Note: EBITDA ratio = (operating income + depreciation and amortization) / net sales

# Business Portfolio Shift

In line with our growth vision, we are striving to become a “Specialty-Fusion Company” and, to this end, accelerating the growth of our specialty businesses while promoting the specialization of our key operations.

and Drug Administration in March 2016. Moreover, Denka Seiken obtained 510k clearance for this product from the U.S. Food and Drug Administration in August 2017. Looking ahead, we will accelerate the implementation of our marketing strategies for this reagent, targeting regions around the globe.

In an effort to enter the cancer treatment business, we launched a new service that provides optimal remedy information via the use of big data-driven gene alteration analysis technologies. We are also looking to secure a contract manufacturer agreement for G47 Δ oncolytic virus, an epoch-making cancer drug based on a genetically modified herpes virus that selectively destroys cancer cells.

## The Environment and Energy

In the field of the environment and energy, Denka’s ultra-high purity acetylene black is widely used as a cathode conductive agent for lithium ion secondary batteries (LiBs). Currently, we are striving to create carbon black with even higher purity while enhancing our technologies to control particle diameters, with the aim of helping enhance LiB performance. Having long been engaged in the development of sophisticated nitriding technologies, we are presently manufacturing silicon nitride ceramic powder and are finding applications for our superior molding and calcining technologies. Thanks to our strengths in the field, our silicon nitride-based products have become increasingly sought after as a material for thermally conductive substrates for power modules used in automobiles and railcars. We are currently striving to enhance their thermal conductivity and strength to differentiate them from competitors in terms of performance.



Denka representatives attending the EV Tech Expo, an electric and hybrid vehicle technology exhibition held in Detroit, Michigan, the United States, in September 2017

## High-Value-Added Infrastructure

In the field of high-value-added infrastructure, we are endeavoring to expand our operations related to special cement additives that help enhance the quality of concrete and mortar. To this end, we are strengthening our production and sales structure in China and Southeast Asia. Taking advantage of burgeoning economic expansion and population

growth in these regions, we will proactively seize growing infrastructure demand associated with the development of traffic and power networks.

## Specialize Our Key Operations

### Policies

- Work to increase “specialty grade” ratio in product lineup to secure resilience to changes in external conditions
  - › Place greater emphasis on product functionalities to promote the specialization of our chloroprene rubber (CR) business
- Shift our focus to the solution business
  - › Apply our special cement additive technologies to develop such products as weed-preventing soil solidifiers, thereby stepping up the provision of comprehensive solutions in our agri-products business

We have acquired chloroprene rubber-related operations from the U.S.-based DuPont, thereby establishing Denka Performance Elastomer LLC (DPE) in the United States. While the chloroprene rubber production facility formally run by DuPont employs the butadiene-based manufacturing method, Denka’s Omi Plant in Japan manufactures this material by using the acetylene-based method. Employing production facilities that use different manufacturing methods for the same purpose has allowed us to make major progress toward creating a truly optimal production system while capturing greater market share. In turn, this structure has helped Denka significantly increase its global presence as a chloroprene rubber supplier.

We have also made CRK Corporation, which handles the manufacture, processing and sale of industrial rubber products, a wholly owned subsidiary as part of our ongoing efforts to accelerate the specialization of our businesses. This move is specifically intended to enhance synergies between Group companies charged with material development and product development.

Furthermore, we have developed Evolmer, a novel elastomer boasting superior oil and heat resistance as well as high amenability via a combination of elastomer technologies that have been developed

### Initiatives to Develop New Businesses to Help Create Next-Generation Automobiles

Automotive Materials & Solutions (AMS) Dept.

Today, the automotive industry is undergoing significant change worldwide in the face of looming issues associated with global climate change and the depletion of natural resources, as well as the emergence of autonomous driving systems and other new technologies now being commercialized. Since its establishment in July 2016, the AMS Department has been engaged in proposing solutions that aim to address issues the industry is now confronting, employing resources across the Denka Group.

Specifically, the department is focused on responding to two major trends, namely, the growing popularity of electric vehicles (EVs) and the acceptance of autonomous driving systems. Looking at the future of automobiles from the four aspects of the “environment and energy,” “safety,” “convenience” and “comfortableness,” we are thus engaged in research aimed at commercializing new business seeds that utilize our core technologies.

Boasting a solid track record in the automotive field, the Denka Group has been supplying an array of products, including elastomers for use in hoses and air suspension systems, raw materials for heat-resistant ABS resin used in car interior and exterior components, electronic circuit substrates for car electronics, carbon black for LiBs, bundling tapes for wire harnesses and structural adhesives. In addition to endeavoring to expand the sales of these offerings, we will strive to nurture new businesses in this field.

over many years, and precision polymerization technologies that reflect a long track record in polymer development. Going forward, we will strive to expand the lineup of high-value-added products, thereby promoting the specialization of the elastomer business as a whole.

## Redefine the Positioning of the Commodity Businesses

### Policies

- Facilitate the transformation of our portfolio to support our future strategies
- Redefine the positioning of commodity businesses that are intrinsically unsuitable for specialization

The Denka Value-Up Promotion Department, a body charged with spearheading Groupwide initiatives under the Denka Value-Up management plan, is pushing ahead with the transformation of our portfolio. Looking ahead, the department will also take the lead in redefining the positioning of commodity businesses that are intrinsically unsuitable for specialization.

Calcium carbide and styrene monomer are representative of our commodity products while also functioning as raw materials for chloroprene rubber and performance plastics. With this in mind, we will review their overall value chains to achieve the optimization of related operations, including production systems.

### Optimization of value chains for calcium carbide and styrene-based products

- › Decided to terminate the production of calcium carbide at the Omuta Plant, decisively overhauled operations boasting a century-long track record since Denka’s founding
- › Entered an alliance with Sumitomo Osaka Cement Co., Ltd. to launch a joint logistics scheme
- › Stepped up collaboration with external companies housed in the same industrial complex in Chiba to streamline utilities

## Accelerate the Growth of Specialty Businesses

### Policies:

- Healthcare
  - › In addition to illness prevention and early diagnosis, we are expanding into cancer remedy and gene alteration analysis to help enhance people’s quality of life.
- The environment and energy
  - › We employ such core technologies as cutting-edge inorganic materials in product development, with the aim of better satisfying the latest needs for solutions that help achieve zero emissions, support autonomous driving systems and assist in other technological pursuits aimed at creating a clean and safe future society.
- High-value-added infrastructure
  - › We strive to meet high-profile infrastructure development needs in countries around the world through the provision of cutting-edge materials and solutions.

## Healthcare

In the healthcare field, we aim to step up our existing operations related to vaccines and diagnostic reagents while expanding into new business fields, including cancer treatment.

To enhance our capabilities in the vaccine business, we made Icon Genetics GmbH, a Germany-based company specializing in biopharmaceutical R&D, a wholly owned subsidiary. Development projects utilizing magnICON, a technological platform created by Icon Genetics, are now under way with the aim of delivering a norovirus vaccine that has yet to be commercialized.

With regard to the diagnostic reagents business, we have developed a reagent to measure sd LDL-C, which is used as a risk marker to diagnose the potential of developing critical diseases. Prior to launching the full-scale marketing of this reagent in July 2018, our business partner secured approval for its production and sale from China’s Beijing Food

# Introduction of Innovative Processes

Focusing on truly essential operations, we will promote the introduction of cutting-edge ICT technologies and the standardization of our processes in an effort to achieve drastic improvements in productivity, create new businesses and execute work style reforms.

## Production Process Reforms

### Policies

- Restructure our production facilities into ICT-based next-generation smart factories
- Build a robust, overarching information platform capable of managing all data on a real-time basis
- Realize manufacturing operations with greater productivity and superior stability

## Our Accomplishments as of the Fiscal 2017 Year-End

The AI & IoT Promotion Section, which was established in October 2017 to promote the utilization of IoT, AI and other cutting-edge technologies, is currently working in collaboration with manufacturing sites at home and abroad and other relevant departments to promote production process reforms and operational process reforms with the goal of doubling labor productivity. In addition, projects now under way at the Group’s four plants in Singapore to create a “smart factory” have been qualified by the Singaporean government as eligible for the country’s innovation-driven growth strategies. Thus, under the auspices of Singapore’s Economic Development Board, these plants have been engaged in five-year initiatives since November 2017 (examples outlined below).

Meanwhile, our domestic production bases have continued to introduce AI-based automated inspection systems, transportation systems using automatic guided vehicles (AGVs) and other automation and

robotics solutions. We are also engaged in the trial operation of a “smarter” production process that utilizes advanced sensing technologies and employs big data analysis. The process is expected to better position us to detect signs of facility failure and achieve more stable operations.

## R&D Process Reforms

### Policies

- Identify R&D themes oriented toward specialization
- Develop R&D assistance systems employing ICT
- Nurture diverse human resources by providing them with strategically designed career paths

## Our Accomplishments as of the Fiscal 2017 Year-End

In fiscal 2017, we promoted collaborative R&D with external corporations, with our younger researchers who have not been at Denka more than 10 years taking leading roles. The purpose of this exercise was to incorporate unconventional ideas and trigger flexible thinking. Simultaneously, we solicited employee proposals on R&D themes that are expected to help create new businesses. By doing so, we strove to engender R&D activities that transcend the scope of materials development.

In the face of a growing trend toward technological development aimed at realizing “Industry 4.0,” we also set up and began utilizing a “data lake” on a server that can be accessed from all business units, with the aim of upgrading our R&D assistance structure. Employing

### “Smart Factory” Initiatives Being Undertaken in Singapore

- (1) Upgrading of network and other infrastructure to boost the plant’s big data collection and consolidation capabilities and to perform the advanced analysis of such data
- (2) Installation of an automated system for constantly monitoring and analyzing vibrations produced by rotating machinery as well as electric waveform and other information to detect signs of possible facility failure and stabilize operations
- (3) Realization of a quicker product quality inspection process by predicting quality based on process data and performing in-line quality analysis
- (4) Optimization of production plans to maximize profitability (using simulations and applying the results)

Note: Discussions about the installation of a system to determine the whereabouts and safety of operators are now under way.

the Open Innovation Management System (OIMS) as a flagship tool for promoting R&D process reforms, we are engaged in the real-time management of progress in R&D activities on each research theme.

Also, we have positioned our human resources as a key driving force promoting the Denka Value-Up management plan. With this in mind, we initiated discussion on how help them achieve a “Value-Shift” and determined the outline of our strategies for nurturing and allocating researchers. Moreover, in fiscal 2017 we dispatched a growing number of researchers to study abroad and encouraged them to acquire diplomas at leading academic institutions, with the aim of nurturing them into Denka’s next-generation leaders in terms of R&D.

## Operational Process Reforms

### Policies

- Facilitate active in-house collaboration through the introduction of futuristic office functions
- Enhance operational productivity
- Develop a location-free working environment

## Our Initiatives in Fiscal 2017 through the First Half of Fiscal 2018

We renovated our Head Office in the aforementioned period. This project was intended to realize a “futuristic office” that fully employs ICT solutions. More specifically, we entirely revamped the facility’s working spaces while massively replacing ICT equipment, so that employees are able to embrace more flexible working styles supported by a paperless platform and a location-free office environment.

Having intensively discussed how to facilitate in-house collaboration and enhance operational productivity, we have revised our Head Office floor plans and realigned working spaces, with emphasis being placed on the following three points.

- ① Facilitate collaboration between sales and administrative departments
- ② Maximize synergies between all Denka business units
- ③ Strengthen the Denka Group’s communication capabilities targeting external audiences

We have thus consolidated four out of five sales departments on the eighth floor and all administrative departments on the 10th floor. Furthermore, we relocated reception and meeting rooms to the ninth floor while newly establishing a manned reception desk on the same floor as part of our efforts to ensure that visitors to the Head Office feel welcome.



A renovated Head Office working space designed to facilitate in-house collaboration

## Developing an IT-Driven Office Environment Supporting Operational Process Reforms

### 1. Creating a “Paperless Office”

In December 2016, we stopped distributing paper-based handout materials at our Board of Directors meetings. This was thanks to the introduction of a paperless meeting platform, with tablet terminals being furnished to each meeting attendee. We are also rolling out the use of this platform to other key meetings.

In February 2018, we introduced an electronic approval system designed to take over from the former conventional application and approval procedures requiring the use of personal seals of relevant individuals on paper documents. We are thus striving to create swifter operational procedures by going paperless.

### 2. Upgrading our ICT Environment

① As part of the aforementioned renovation of Head Office facilities in July 2018, we have made secured wireless LAN connection available from anywhere in the building. Thanks to this move, all Head Office employees are now able to access the Company’s intranet system via laptop and engage in tasks whether at a desk or in a meeting room.

② We have installed projectors and monitors in all meeting rooms and spaces, with the aim of eliminating the need for paper-based handout materials. This move is expected to improve the efficiency of meeting preparation by freeing up resources that had been used for printing, copying and distributing presentation materials.



### 3. Future Initiatives

① We will introduce a document management system to expand the scope of paperless in-house operational procedures. We will also make it a rule to store important meeting materials in the form of electronic data rather than paper document. This will be not only labor saving but space saving as the need for massive storage space is eliminated.

② With the aim of facilitating in-house communication, we will engage in such initiatives as the additional installation of teleconferencing systems, the introduction of a next-generation groupware and the expansion of intranet portal content.

# Business Strategies | Life Innovation

Looking to improve the quality of life for people worldwide, the Denka Group is steadily implementing a variety of initiatives in the healthcare field, which boasts significant growth potential. These initiatives include promoting illness prevention and early diagnosis in addition to expanding into cancer remedy and gene alteration analysis.

Looking ahead, by focusing our management resources on the priority healthcare field and speeding up the development of next-generation products, we will contribute to the entire Denka Group’s efforts to accelerate the growth of its specialty businesses.

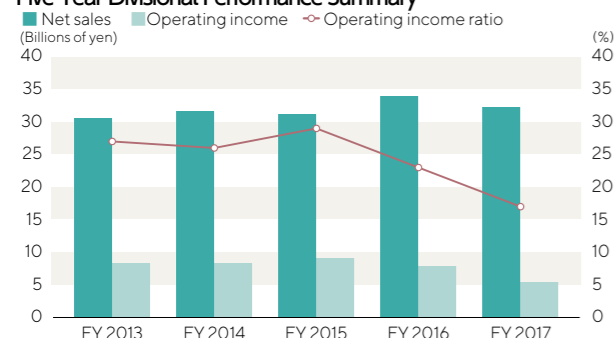


## Review of the Denka100 Management Plan

### 1 Denka100 Initiatives

- 2015 Developed prototype Ebola virus rapid diagnostic test kits
- 2016 Completed a new manufacturing facility at Denka Seiken’s Kagamida Plant
- 2016 Our business partner obtained Beijing FDA approval for the production and sale of a reagent for measuring sd LDL-C
- 2016 Established an R&D base in Singapore
- 2016 Entered a business alliance with the Taiwan-based PlexBio Co., Ltd.
- 2017 Established Denka-KEW Genomics LLC
- 2017 Acquired U.S. FDA 510k clearance for the reagent for measuring sd LDL-C
- 2017 Released QuickNavi™-Flu 2 rapid diagnostic test kit
- 2017 Made Icon Genetics a wholly owned subsidiary
- 2017 Completed a facility for manufacturing G47Δ oncolytic virus

### Five-Year Divisional Performance Summary



## Business Strategies under Denka Value-Up

### 1 The Market Environment

- Growth in healthcare expenses due to the progressive aging of society and the sophistication of medical technologies
- Increasing risk of infectious disease pandemics, reflecting the formation of a global traffic network on the back of economic growth in developing countries
- Solutions for illness prevention and early diagnosis have become ever more important

### 2 Strategies

- Step up key operations (influenza vaccines, diagnostic reagents, macromolecular sodium hyaluronate preparation, etc.)
- Get new businesses smoothly on track (anticancer virus and Denka-KEW Genomics, etc.)
- Promote open innovation to create products and technologies for future generations (Denka Innovation Center, Icon, Denka Life Innovation Research, etc.)

## Characteristics of the Business Division

- Technologies:** Bacterial and virological cultivation and refinement technologies, antigen and antibody reaction control technologies, monoclonal antibody production technologies, etc.
- Products:** Vaccines, diagnostic reagents, joint function improvers, etc.
- Business fields:** Healthcare (diagnosis, treatment and prevention)

Denka Seiken Co., Ltd., a core subsidiary supporting the Life Innovation Division, is striving to enrich the Group’s lineup of products associated with disease prevention, health checkups and diagnosis and has established a manufacturing facility for cancer drugs in October 2017. This new facility supports the cancer remedy business, which Denka Seiken is working to establish as its third business pillar next to vaccines and diagnostic reagents in a bid toward achieving significant growth.

Also, Germany-based Icon Genetics GmbH became a wholly owned subsidiary with the completion of an additional acquisition of shares in August 2017. Employing magniCON, a technological platform created by Icon, we are developing norovirus vaccines, creating new technologies that will replace conventional technologies for producing seasonal influenza vaccines, and manufacturing antigens for use in diagnostic reagents.

## Main Achievements in Fiscal 2017

- Denka Seiken Co., Ltd. acquired 510k clearance\* for a reagent that measures small, dense LDL cholesterol (sd LDL-C) from the U.S. Food and Drug Administration (FDA). Also, the company expanded its lineup of QuickNavi™ series rapid diagnostic test kits for detecting infectious diseases with the release of a new test kit for detecting mycoplasma antigen and introduction of an improved influenza virus antigen test kit.
- We entered a basic agreement with PlexBio, a strategic partner headquartered in Taiwan, with regard to the joint development of an infectious

disease diagnostic testing system comprising a new set of equipment and reagents, with the aim of reducing the time required to detect pathogenic microorganisms and drug resistant bacteria genes. In this way, we aim to address a major issue medical practitioners are now confronting in the field of infectious diseases.

\* 510k clearance: Approval granted by U.S. FDA for the sale of Class I and II medical equipment and in-vitro diagnostic reagents. The U.S. FDA applies a three-tiered risk-based classification system that designates such items as Class I, II or III.

## Challenge

- Expand the scope of operations by accurately assessing the latest market trends

**Product example** Reagent for measuring sd LDL-C

**Social issue** • High mortality rate of heart disease patients

**Source of value** Applied technologies deriving from lipoprotein subclass detection technologies that have been cultivated through the involvement in the diagnostic reagent business

This reagent is used to measure the density of sd LDL in the overall cholesterol count. To date, the measurement of LDL cholesterol has proved insufficient as a risk indicator for heart disease and coronary heart disease; however, the measurement of sd LDL-C promises to serve as an accurate risk indicator. A special method had to be devised so that sd LDL-C, one of a number of the lipoprotein subclasses that comprise LDL cholesterol, could be measured. Moreover, Denka Seiken had to apply its highly sophisticated diagnostic reagent technologies to develop the reagent so that it could be employed in commonly used automated clinical chemistry analyzers. We are convinced that the creation of a simple, quick and low-cost diagnostic solution for assessing heart disease risk will promote the maintenance of good health, help prevent disease and reduce medical expenses. Having acquired U.S. FDA 510k clearance for this reagent in August 2017, we have thus initiated full-scale marketing in that country in July 2018.

**3 GOOD HEALTH AND WELL-BEING**

# Business Strategies | Electronics & Innovative Products

We are aware of the ever-more stringent customer requirements regarding product miniaturization, performance, safety and reliability that are being required of electronics device makers on the back of advances in ICT and the emergence of such technologies as autonomous driving systems. With this in mind, we will deliver optimal materials to our customers by fully leveraging a variety of key in-house technologies that enable us to meet constantly evolving needs. In these ways, we will contribute to the betterment of society.

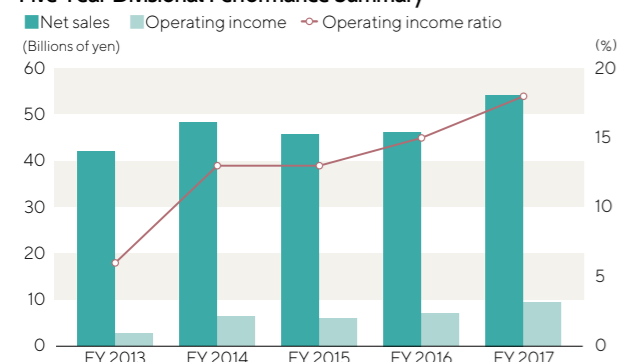


## Review of the Denka100 Management Plan

### 1 Denka100 Initiatives

- 2013 Stepped up our capital alliance with SEI Corporation and accelerated technological development aimed at increasing the conductivity of LiB electrode materials
- 2013 Initiated the construction of an ultra-high purity acetylene black production facility
- 2013 Established the NIMS-DENKA Center of Excellence for Next-Generation Materials
- 2013 TEMPLOC temporary coupling agent was chosen to receive an Award from the Society of Polymer Science, Japan
- 2014 Commenced the construction of a new facility in Vietnam to produce Denka Thermo Film for use as an embossed carrier tape for electronic components
- 2015 Completed a new production base in Dalian, China, for the manufacture of ALSINK, a highly-reliable thermal conductive plate
- 2016 Established the Automotive Materials & Solutions Dept.

### Five-Year Divisional Performance Summary



## Business Strategies under Denka Value-Up

### 1 The Market Environment

- Formation of new markets due to the popularization of EVs, HEVs and other eco-friendly vehicles
- Changes in market needs in the face of growing needs for the combination of automotive technologies and ICT
- Growing presence of new technologies, reflecting breakthroughs in IT and displays

### 2 Strategies

1. Accelerate specialization
  - Promote the specialization of our businesses targeting the semiconductor, electronic component and vehicle-mounted device markets
2. Boost our production capabilities to better serve growth markets
  - Conduct timely capital investment to secure responsiveness to a rapid surge in demand
3. Expand new businesses
  - Push ahead with development projects to realize earlier commercialization

## Characteristics of the Business Division

**Technologies:** Ceramics sintering and calcining, particle manufacturing, nitride synthesis, precision processing and machining, material composite, sheet and film lamination, thermal conductive, heat and light curing, static electricity control, coating and painting and adhesive technologies as well as optical property control technologies, including those associated with controlling the refractive index

**Products:** Ceramics, inorganic fillers, sheets and films, electronic circuit substrates, adhesives, electron guns for electron microscopes, etc.

**Business fields:** Automobiles, electric and electronic devices, aircraft and spacecraft, rolling stock, marine vessels, the environment and energy, communication, power, etc.

The Electronics & Innovative Products Division boasts an array of products that are essential to the field of electronic materials. Its offerings include electronic parts materials, thermal solution components, packaging materials for transporting electronic components, and structural adhesives. Moreover, in April 2018 the division took over the production of acetylene black, a key offering used as a conductive agent for lithium ion secondary batteries (LiBs), from the Elastomers & Performance Plastics Division.

With the aim of addressing growing demand for materials for use in such eco-friendly vehicles as EVs, we will facilitate robust information sharing, a move that will enable us to respond quickly to customer requests and expand sales while developing new on-trend products.

## Main Achievements in Fiscal 2017

- Enhanced the color reproduction property of the  $\beta$  SiAlON Phosphor
- Released silicon nitride ceramics plate (SNP) backed by a thick copper substrate for use in large-current power modules
- Expanded the sales of metal circuit substrates for use in LED-based automobile headlamps
- Expanded sales of thermally conductive spacers and particle-grade acetylene black for use in automotive-use LiBs
- Expanded sales of spherical alumina for use as thermal solutions used in communication and vehicle-mounted devices

## Challenges

- Employ our production and development technologies in a lasting and strategic manner
- Execute production and operational process reforms while taking a flexible stance in human resource management
- Step up initiatives to secure product quality, pursue environment friendliness and mitigate risk in the face of business expansion



The  $\beta$  SiAlON Phosphor

Product example

Acetylene black

7

AFFORDABLE AND CLEAN ENERGY

Social issue

- Promote the use of clean energy
- Promote the use of eco-friendly vehicles

Source of value

Technologies for enhancing the purity of electro-conductive materials

Our acetylene black, made using acetylene gas, boasts minimal foreign matter content (such as sulfur or metal). Thanks to its purity, this product has become an essential material for LiBs and the internal and external semiconductor layers of cables. Acetylene black has a unique structure capable of mitigating changes in the cubic volume of LiB active materials that occurs during electric charge and discharge. This, in turn, helps prevent the deformation of electrodes and thus prolongs the product life of LiBs.

# Business Strategies | Infrastructure & Social Solutions

The source of the division’s competitive advantages lies in in-house hydroelectric power generation capabilities backed by access to abundant water resources as well as company-owned limestone mines. Leveraging these strengths, we are endeavoring to provide solutions that accurately satisfy the latest customer needs in agricultural and social infrastructure development industries while focusing on advancing energy and resource saving as well as global warming countermeasures.

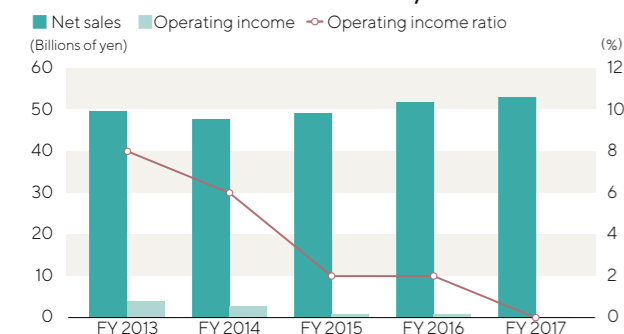


## Review of the Denka100 Management Plan

### 1 Denka100 Initiatives

- 2013 Launched a full-scale expansion into markets overseas with special cement additives, announcing marketing strategies for China and Southeast Asia
- 2014 CO<sub>2</sub>-SUICOM, environment-friendly concrete, was chosen to receive the Environment Minister's Award for Global Warming Prevention Activity
- 2015 Made the Malaysia-based POSCO Venture Sdn. Bhd. a Group subsidiary
- 2015 CO<sub>2</sub>-SUICOM was chosen to receive the Chairperson's Award under the Eco-Products Awards program sponsored by Eco-Products Awards Steering Committee
- 2016 Made PT ESTOP Indonesia, an Indonesia-based construction material maker, a Group subsidiary
- 2017 Established a subsidiary aimed at streamlining cement-related logistics operations

### Five-Year Divisional Performance Summary



## Business Strategies under Denka Value-Up

### 1 The Market Environment

- Growing demand for solutions supporting infrastructure development, maintenance and upgrading (related to post-disaster reconstruction, publicly funded investment in new facilities and countermeasures to the aging of facilities)
- Burgeoning infrastructure development needs in China and Southeast Asia and growing demand for high-performance specialty products in Europe and the United State
- In farming, trends are toward labor saving and large-scale operations to shore up Japan’s agricultural sector
- Growing need for ecological solutions

### 2 Strategies

- Develop products that support infrastructure maintenance and cultivate relevant markets
- Facilitate the utilization of recycled waste and thereby help develop a recycling-oriented society
- Step up overseas expansion by augmenting our local network for special cement additives in Asia
- Maximize profitability by optimizing our production system
- Promote the development of novel farming materials, thereby reinforcing our solution business targeting the agricultural sector
- Propose and implement solutions to help create energy-saving, environment-friendly steel and industrial furnaces

## Characteristics of the Business Division

- Technologies:** In-house power generation, mining, concrete hardening, expansion and contraction, material design, construction and repair technologies and soil improvement and fertilization technologies as well as high-temperature calcining technologies for inorganic materials and polymer processing technologies
- Products:** Cement, cement additives, fertilizers, inorganic chemicals and plastics
- Business fields:** Civil engineering, construction, iron-making, ceramics, energy, agriculture, automobiles, etc.

The Infrastructure & Social Solutions Division handles cement and special cement additives, both of which are essential for infrastructure development; corrugated pipes for water catchment and discharge systems used to manage ground and river water; calcium carbide and calcium cyanamide fertilizers— key offerings Denka has been manufacturing for more than a century; fire resistant materials; desulfurizing agents; and other materials for use at such facilities as steelworks.

Among these, our special cement additive business is aimed at serving markets in China and Southeast Asia, where rapid infrastructure development is under way. To that end, the division’s manufacturing, sales and R&D sections are working together as one to deliver a range of related offerings and services, from novel materials and innovative construction and repair methods to structural diagnosis.

## Main Achievements in Fiscal 2017

- ▶ **Cement**  
Proactively accepted waste and byproducts for resource recycling
- ▶ **Special cement additives**  
Initiated the supply of quick-setting agent for use in tunnel construction for the Liner Chuo Shinkansen (bullet train line)  
Commercialized DENKA POWER CSA expansive additive for flooring materials used in factories and logistics facilities
- ▶ **Agri-products**  
Promoted the production of fertilizers employing combustion ash from chicken droppings used to feed biomass power generation facilities
- ▶ **Inorganic products**  
Developed high-value-added products boasting superior heat insulation
- ▶ **Environmental materials**  
Supplied materials for underground drainage being installed as part of the reconstruction of disaster-stricken rice paddies in Miyagi Prefecture  
Promoted the use of underground irrigation systems designed to facilitate multi-functional rice paddies

## Challenges

- ▶ **Cement**  
Develop new recycling technologies
- ▶ **Special cement additives**  
Propose even better solutions for large projects to secure greater market presence  
Proactively expand overseas operations to secure sustainable growth
- ▶ **Agri-products**  
Expand sales of products made of naturally-derived ingredients, such as humic acid and chicken droppings
- ▶ **Inorganic chemicals**  
Develop fire-resistant materials and thermal insulation products to meet individual customer needs
- ▶ **Environmental materials**  
Promote the adoption of a farmland development model that fully leverages Denka’s unique strengths.

**Product example** DENKA ALCEN Sustainable Cities and Communities

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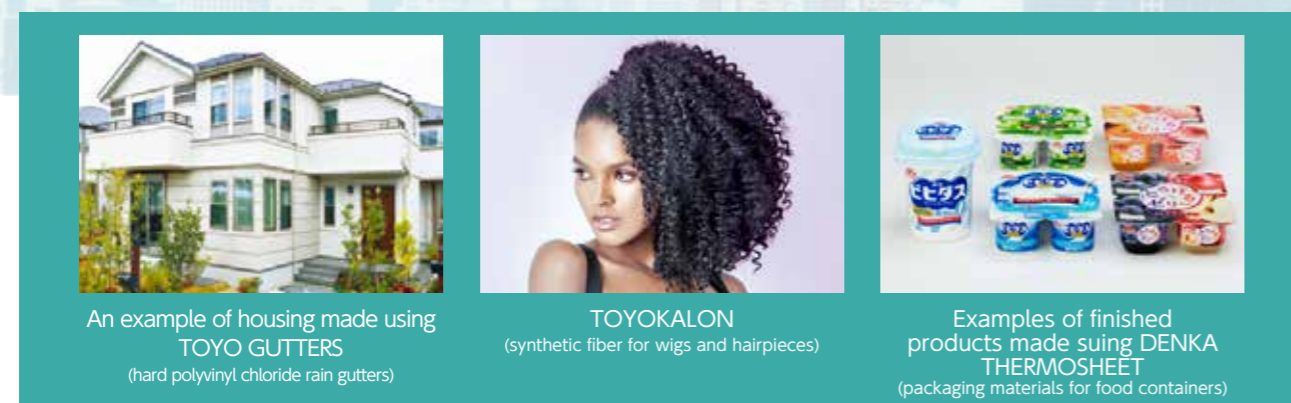
<b>Social issue</b> <ul style="list-style-type: none"> <li>• Energy saving</li> <li>• Purification of automobile exhaust gas</li> <li>• Need for reduced environmental burdens</li> </ul>	<b>Source of value</b>	Fabric spinning and material calcining technologies to produce protective materials
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This product is used as a raw material for automotive components designed to hold ceramic catalysts and filters that purify exhaust gas thanks to its superior resistance to high heat and vibration, both of which are inherent to the functioning of automobiles. It is also used as a thermal insulator for industrial furnaces. Boasting lower density, lighter weight and lower thermal conductivity than firebricks, which have been traditionally used for the same purposes, this product helps reduce the overall weight of furnaces while curbing energy consumption.

Example of usage as support mat for catalyst carrier

# Business Strategies | Living & Environment Products

We will take on the pursuit of new value without insisting on limiting the search to a particular material or field and, to this end, fully take advantage of our strengths in the areas of technology and quality, with the aim of supporting the entire Group in our role as a chemical engineering division. In these ways, we will create and deliver products that satisfy market needs to in-house and external partners.



## Characteristics of the Business Division

**Technologies:** Sheet film manufacturing technologies, adhesive manufacturing and adhesion coating technologies, resin compounding technologies, plastic ejection processing technologies, etc.

**Products:** Resins, elastomers, molded metal products, films, sheets synthetic fibers, etc.

**Business fields:** Architectural materials, wigs and hairpieces, and food packaging

The Living & Environment Products Division is engaged in wide-ranging businesses that directly affect people's lifestyles and living environments. For example, it handles materials for construction use, such as rain gutters, as well as industrial tapes and food packaging materials. Moreover, in anticipation of future growth in demand in markets abroad, the division is promoting the overseas production of TOYOKALON, a synthetic fiber for wigs and hairpieces, VINI-TAPE for such applications as electrical insulation and automotive wire harnesses, and multilayer food packaging sheets.

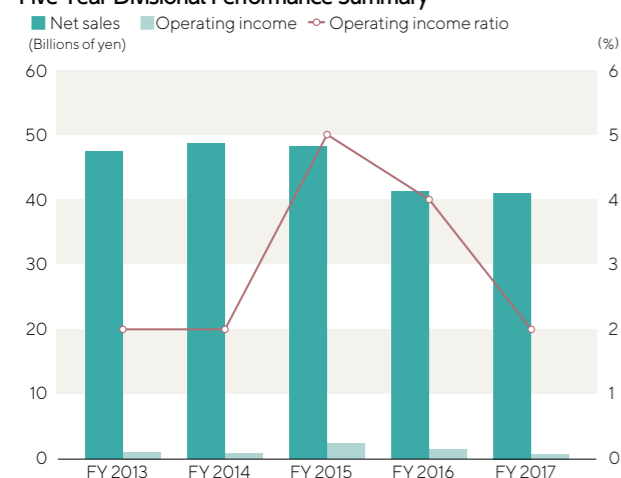
Employing the Company's strength in fluorine-based films, the division is pushing beyond the scope of its traditional areas of operations related to solar cell back sheets as it seeks to expand into interior decorating materials through the provision of surface decorating films. In addition, we are promoting TEFKA film, which has superior fire retardant properties and transparency, with an eye to launching full-scale marketing to supply materials for membrane structures. Going forward, we will push forward with global expansion targeting such regions as Asia, Europe, the United States and Africa.

## Review of the Denka100 Management Plan

### 1 Denka100 Initiatives

- 2013 Completed a new TOYOKALON production base in Singapore
- 2013 Commenced the construction of a new food packaging sheet manufacturing facility in China
- 2013 Established a new subsidiary in Vietnam and decided to construct a new VINI-TAPE production facility
- 2014 Established a local subsidiary in Dubai
- 2015 Completed the new VINI-TAPE production facility in Vietnam
- 2016 Developed Mighty Guard, a heat- and oil-resistant sheet

### Five-Year Divisional Performance Summary



## Business Strategies under Denka Value-Up

### 1 The Market Environment

- The maturation of the domestic market and intensifying competition
- Growth in market potential reflecting the burgeoning purchasing power of emerging economies
- Growing public awareness of the need for environmental load reduction
- Growing interest in food safety

### 2 Strategies

- Enhance facility utilization at home and abroad and establish an optimally-balanced production structure
- Scrutinize every cost element to secure an even stronger business structure
- Strategically allocate resources to growth drivers

## Main Achievements in Fiscal 2017

### ▶ Better serving overseas markets

- 1 Launched full-scale production and marketing of harness tapes at Denka Advanced Materials Vietnam
- 2 Launched full-scale production of TOYOKALON at the Tuas South Plant of Denka Advantech Pte., Ltd. in Singapore
- 3 Studied the feasibility of new businesses

### ▶ Developing new products

Developed the industry's thinnest and lightest PVC adhesive tape for use in automotive bundling tapes for wire harness

## Challenges

- Promote the optimization of our production system while reorganizing the current business structure
- Create next-generation businesses and cultivate markets for new offerings
- Allocate greater resources to and step up the development of products aimed at helping reduce environmental burdens

Product example

### Cold-resistant thin harness tape

• Make cities and human settlements inclusive, safe, resilient and sustainable

**Social issue**

- Popularization of eco-friendly vehicles
- Needs for solutions enhancing driving safety

**Source of value**

Technologies to realize the smallest thickness and weight while retaining cold resistance

This product is used as an adhesive tape for bundling automobile wire harnesses.\* The thinnest and lightest tape in the industry, the product contributes to the creation of light-weight automotive components while also contributing to the maintenance of driving safety in cold regions as it can be used at temperatures as low as minus 30°C. In addition, we employed environment-friendly ingredients to produce the adhesive used in this product.

In the face of EV popularization and the emergence of autonomous driving systems, car electronics makers are expected to face even stricter customer requirements in terms of product reliability. We will help satisfy such requirements by employing proprietary Denka technologies.

\*Wire harness: An electrical wiring assembly for use in equipment like automobiles and home appliances to transmit electronic signals and power



# Business Strategies | Elastomers & Performance Plastics

Leveraging a broad range of techniques and experience in synthesizing, compounding and molding polymers, we are bolstering technological innovation in such manufacturing fields as automobiles, home appliances and food packaging. By doing so, we are contributing to the sound development of society.

Currently, the division’s overseas sales ratio is holding stable at over 60%. In addition to our production bases in Japan, we operate overseas plants in the United States and Singapore. We will fully employ these facilities to meet the ever-growing needs of the global market while developing specialty businesses with outstanding competitiveness and presence.



Examples of CR-based automobile parts

Examples of products made using DENKA TRANSPARENT POLYMER (styrene-based functional resin)

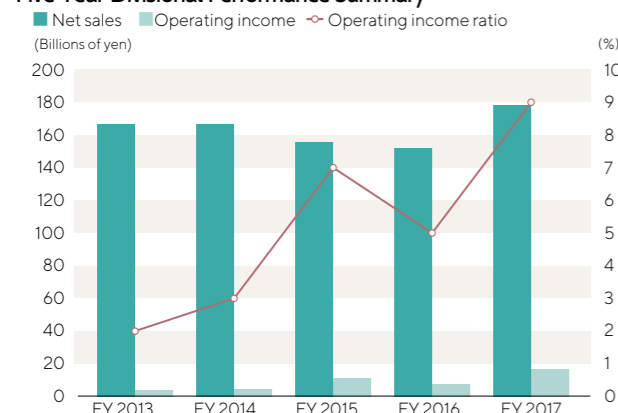
A slope that has been sprayed with DENKA COAT soil erosion prevention agent

## Review of the Denka100 Management Plan

### 1 Denka100 Initiatives

- 2014 Withdrew from the vinyl acetate monomer business
- 2014 Overhauled ABS resin and special functional resin production processes to enhance manufacturing competitiveness
- 2014 Signed an agreement with the U.S.-based DuPont with regard to the transfer of its operations related to Neoprene™
- 2015 Completed the transfer of the Neoprene™ business from DuPont
- 2015 Co-developed rubber bearings for bridges based on a new material boasting significantly improved ozone resistance
- 2016 Optimized utilities for the Chiba Plant to enhance manufacturing competitiveness

### Five-Year Divisional Performance Summary



## Business Strategies under Denka Value-Up

### 1 The Market Environment

- Burgeoning demand for ecological solutions and growing public awareness of safety and healthcare
- Increasing market presence of commodity manufacturers based in emerging economies
- A shift to overseas production in electronics, automotive and other related markets on the back of demand growth in emerging economies
- Growing trend toward protectionism in some regions

### 2 Strategies

- Develop high-value added businesses to secure resilience against changes in the trading environment, thereby achieving sustainable growth
- Focus resources to growth fields and promote collaboration with external companies with the aim of developing new businesses
- Optimize all processes from production to sales while developing a more robust structure capable of better serving the global market
- Upgrade the functions of the Product Safety Management Section to ensure the stricter management of chemical content and more robust quality assurance

## Characteristics of the Business Division

**Technologies:** Polymer structure design and polymer composite technologies, material composite and compounding technologies, high-purity technologies, particle diameter control technologies, emulsification control technologies, etc.

**Products:** Resins, elastomers and acetyl chemicals

**Business fields:** Automobiles, electric and electronic devices, food packaging, household goods for daily use, etc.

The Elastomers & Performance Plastic Division is in charge of three business categories: the elastomer business, which includes our flagship global market leading chloroprene rubber (CR) operations; the performance plastics business, which boasts highly functional styrene-based products in an array of grades; and the styrene and chemicals business, which centers on styrene monomer and acetyl chemicals.

## Main Achievements in Fiscal 2017

- Denka Performance Elastomer LLC achieved profitability in its second year of operations, which date back to the 2015 acquisition of DuPont’s CR-related operations
- Made CRK Corporation, a company engaged in the production, processing and marketing of synthetic rubber products, a wholly owned subsidiary
- Augmented the structure for chemical content management and quality assurance via the allocation of additional staff to the Product Safety Management Section
- Reduced the workload for routine tasks by approximately 20% thanks to the success of streamlining via operational process reforms

## Challenges

- Increase profits from the elastomer business by expanding the production volume of CR and DENKA ER, enhancing CR functions and maximizing synergies between two CR production bases in Japan and the United States in addition to the introduction of Evolmer, a novel elastomer
- Step up strategic involvement in technical services which will, in turn, enable us to quickly acquire tips from users with regard to their latest needs and develop new products and grades to meet such needs
- Capture burgeoning demand in the optical field to expand sales of resin products
- Promote the overall specialization of our businesses in the fields of resins and chemicals via the development of highly functional products
- Utilize AI and IoT to renovate our production and supply chain processes and enhance our competitiveness
- Introduce customer management and business assistance tools to achieve further improvement in operational productivity

**Product example** DENKA ER 7 AFFORDABLE AND CLEAN ENERGY Affordable and Clean Energy

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<b>Social issue</b> <ul style="list-style-type: none"> <li>• Global warming</li> <li>• Popularization of eco-friendly vehicles</li> </ul>	<b>Source of value</b> <p>Our capabilities to develop optimal materials for turbo charger hoses and meet user needs via the proposal of composite technologies</p>
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DENKA ER, consisting of ethylene, vinyl acetate and acrylic acid ester, boasts superior heat resistance that allows it to withstand a temperature as high as 175°C as well as durability against corrosion attributable to simultaneous exposure to heat and oil. This special acryl-based rubber is used in the peripheral hoses of automobile turbo chargers. In this way, DENKA ER is contributing to automobile fuel efficiency and thereby helping to counter global warming.

## Product Safety

### Initiatives to Ensure Product Safety

In fiscal 2017, we strove to maintain strict compliance with laws, regulations and corporate ethics with regard to product safety and, to this end, engaged in the acquisition of information, surveys and communication in line with guidelines we established in 2016 for the management of chemical substances used in our products while reviewing the status of such activities.

As part of our initiatives to strengthen our corporate governance, we also worked to upgrade quality and environmental management systems in place at each business site and affiliate to secure conformity with the 2015 version of ISO 9001 and 14001 standards. At the same time, we updated in-house quality management rules and guidelines and stepped up education for managers with regard to quality management.

We will continue to implement measures to strengthen our corporate governance in fiscal 2018 and beyond. Employing our product safety management system, we will also engage in product stewardship initiatives aimed at ensuring that throughout their entire life cycles our products have no harmful impact on human health and minimal environmental footprints. As part of these initiatives, we will continue to provide our stakeholders with sufficient product information through the preparation of Safety Data Sheets while further developing our organizational structure and in-house rules to secure compliance with ever stringent legal regulations.

### Initiatives to Enhance Product Quality

By the end of fiscal 2017, some 80% of Denka's domestic production sites completed the upgrade of their quality and environmental management systems, bringing them into conformity with the 2015 version of ISO 9001 and 14001. With 70% of Group facilities having upgraded their quality and environmental management systems, plans now call for completing the upgrade process for all remaining Group facilities by September 2018. Upgraded systems now in place include procedures aimed at addressing possible emergencies (e.g., lack of labor force, infrastructure disruption and supplier problems) and the standardized utilization of Failure Mode and Effect Analysis (FMEA) in product design and development. These additional elements are expected to help us enhance the level of quality assurance.

Going forward, we will continue striving to boost our quality assurance capabilities by, for example, acquiring IATF 16949 automotive quality management system standard certification and conducting more robust design reviews at the R&D stage.

### Major Quality Issues and the Number of Complaints

Since April 2016, we have experienced no product liability-related problems or major quality issues, such as serious client complaints or product recalls due to critical product defects. Moreover, the number of complaints registered in fiscal 2017 was down approximately 8% year on year, a continuation of the declining trend we have seen over the last several years (359 in fiscal 2015; 326 in fiscal 2016; and 298 in fiscal 2017).

## Creating New Products and Technologies That Contribute to Social Sustainability

### Initiatives Undertaken by the New Business Planning & Development Department

#### ①Dedicated Team and Task Forces in Operation

The New Business Creation Team, a dedicated body charged with spearheading across-the-board initiatives aimed at creating new businesses, is currently engaged in theme exploration, scenario planning and feasibility studies\* to help accelerate commercialization. In fiscal 2017, three taskforces were launched under the team to this end. With the New Business Planning & Development Department acting as a coordinator, efforts are also under way to raise employee awareness of new business creation and help them crystallize the specifics of their business blueprints.

#### ②Acquiring “Missing Parts” to Smoothly Launch New Businesses

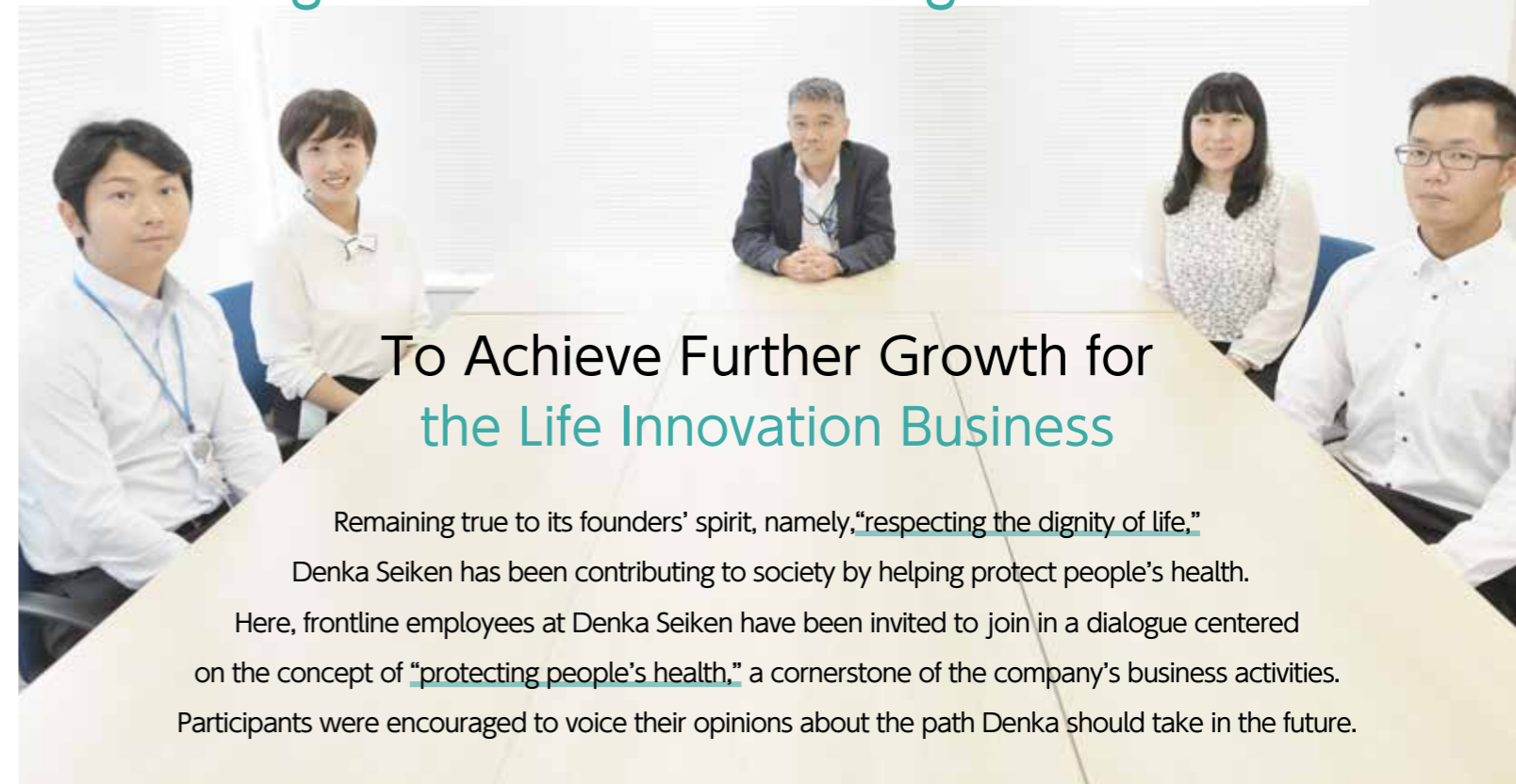
To speed up our business creation initiatives, we are striving to shorten the development period by acquiring “missing parts,” namely, essential technological elements that can only be acquired from external sources. For example, Denka is a member of the Industrial Liaison Program sponsored by the Massachusetts Institute of Technology in the United States. This program is intended to help members collaborate with venture startups, and Denka is benefitting from it in terms of acquiring missing parts and discovering cutting-edge technologies applicable to its operations. Denka also utilizes J-GoodTech, an online business matching platform run by the Organization for Small & Medium Enterprises and Regional Innovation, JAPAN.

#### ③Scenario Planning Aimed at Creating New Businesses

As part of initiatives to promote open innovation, young researchers at Denka interact with their peers at several partner companies. This encourages the generation of ideas for new businesses and facilitates scenario planning. Of countless theme candidates that have been identified via this interaction, more than 300 have been dropped from discussion due to the unlikelihood of the candidates benefiting either Denka or a partner. However, we have re-examined even discarded candidates on our own based on three perspectives, namely, core competence, scalability and practicality. As a result, we reassigned one theme candidate in fiscal 2017 to a feasibility study subject.

\* Feasibility study: A process in which the possible commercialization of a new business is examined from the standpoint of securing ongoing profitability and other factors

## Special Feature 3 | Dialogue between Staff in Charge of Life Science



### To Achieve Further Growth for the Life Innovation Business

Remaining true to its founders' spirit, namely, “respecting the dignity of life,”

Denka Seiken has been contributing to society by helping protect people's health.

Here, frontline employees at Denka Seiken have been invited to join in a dialogue centered on the concept of “protecting people's health,” a cornerstone of the company's business activities. Participants were encouraged to voice their opinions about the path Denka should take in the future.

### Committed to fulfilling our fundamental mission of maintaining a stable supply of pharmaceutical products

**Yamazaki:** The very purpose of our products, such as diagnostic reagents, is to benefit patients. Therefore, looking at it as a patient, I believe that we are playing an essential role by delivering these products in a timely manner and enabling medical practitioners to conduct swift diagnostic testing that ensures optimal treatment and correct prescriptions. I believe all Denka Seiken employees, including me serving as a sales representative, are well aware of the importance of maintaining stable product supply.

**Arai:** The company consolidated diagnostic reagent production facilities at its Kagamida Plant in 2016. Thanks to this move, staff at production departments are now able to engage in more robust communication, which, in turn, helps strengthen our ability to maintain stable supply.

**Muramatsu:** I agree. For example, staff in charge of each production process often discuss methods for stabilizing diagnostic reagent production and increasing its output. In-house collaboration is now smoother than ever before.

**Yamazaki:** Demand for influenza rapid diagnostic test kits (POCT\* reagents) can rapidly surge once an influenza outbreak emerges. Producers of these rapid test kits



are called to maintain supply capabilities to secure responsiveness to emergencies of this kind and we are confident about our capabilities to address such a situation.

**Shao:** During the most recent winter season—late 2017 through early 2018—there were influenza outbreaks in South Korea, China and Thailand. Amid these outbreaks, Denka Seiken did not fail to meet any single shipping request. I also think that our important role as a maker is to ensure that local diagnostic reagent distributors in outbreak regions can fill patient needs without a fear of product shortfalls.

### Striving to increase value delivered to patients through quality management

**Arai:** We are called to maintain not only a stable mass-production capability but also high quality standards. Accordingly, we take a thoroughgoing approach to the review and management of production records. At the same time, we regularly reconfirm the quality management efforts undertaken by the entire department.

**Shao:** In recent years, a number of non-Japanese makers in China and elsewhere in emerging economies have enhanced their product quality. Despite these circumstances, Denka Seiken products retain a strong market position. This, I believe, attests to the success of our quality management and other initiatives that have helped us to earn customer confidence in Japan and abroad.



**Shujiro Yamazaki**

Manager, Reagents Sales Department

Service years: 22

I will help Denka Seiken become a leading company through further growth.



**Tsugihiko Yara**

Assistant Manager, Global Business Development, Sales & Marketing Div.

Service years: 8

In addition to the B to B business, I consider the possibility of the company entering a B to C business.



**Shao Rongbing**

Supervisor, Asia Business Development, Sales & Marketing Div.

Service years: 10

I would like to raise Denka Seiken's brand strength in China and other countries abroad.



**Shino Muramatsu**

Group Leader, R&D Center, Kagamida Plant

Service years: 10

I would like to develop products that help people lead a happier life.



**Daichi Arai**

Bacterial & Viral Diagnostics Dept., Kagamida Plant

Service years: 5

I aim to develop a robust manufacturing environment that helps us respond to emerging needs for new products.

**Yara:** In terms of gaining customer trust, I recognize that taking a mindful and meticulous approach to customer service is as important as maintaining quality that lives up to customer expectations. Thanks to this approach, which happens to be an inherent strength of many Japanese makers, we have succeeded in differentiating ourselves from competitors. Although we offer an array of products made using raw materials of biological origin, we engage in tireless efforts to provide customers with accurate information and robust after-sales services that address their concerns. This is how we are winning their trust.



**Yamazaki:** I often discover valuable customer opinions and requests from daily sales reports submitted by sales offices and branches around Japan. These inputs help us upgrade our quality management capabilities.

**Arai:** We are also called to meet regulatory mandates in terms of product and substance registration. However, regulations are constantly changing. So, I organize study sessions to keep our staff updated while utilizing new findings in quality management.

**Endeavoring to help as many people as possible enhance their quality of life (QOL)**

**Shao:** I am in charge of diagnostic reagents for measuring lipoprotein subclasses, which serve as early indicators of possible deterioration in patient health. Thanks to these products, patients can be advised about what measures they should take to avoid serious symptoms even before they recognize they are ill. This contributes to their QOL in addition to reducing the burden of medical expenses for the whole nation.

**Arai:** As a member of the manufacturing staff, I believe that a stable product supply is also a factor enhancing QOL. In the face of a rapid increase in the number of new products being released, I am striving to optimize our schedules of operations, covering procurement to manufacturing, with an eye to better serving the market.

**Muramatsu:** The Ebola virus rapid diagnostic test kit is the kind of product that really makes my work on the R&D staff rewarding. It exemplifies the success of our efforts to help people around the world maintain their QOL. If I were to cite a more familiar example, I would say that when I attend clinical trials and see

our products are being used, it really brings it home to me that my job is helping people.

**Yara:** As a sales representative, I strive to coordinate relevant in-house business units so that our products are smoothly delivered to customers who seek to improve their QOL. I am also aware of the importance of always paying attention to the latest customer needs.

**Yamazaki:** The earliest version of influenza diagnostic test kits required complicated procedures consisting of some 10 steps to yield testing results. To meet customer requests, Denka Seiken has developed a diagnostic reagent capable of obtaining results in a single step. Thanks to this invention, the POCT reagents have become fairly popular. I believe this is yet another instance in which Denka Seiken has contributed to enhanced QOL.

**Our corporate value hinges on taking on the challenge of expanding the possibilities of chemistry**

**Yara:** For Denka to increase its corporate value, it is important to flexibly accommodate customer requests and deliver products exactly when customers want us to deliver. I also feel that a B to C business approach has significant earnings potential. Once the company incorporates this approach, accelerating the pace of development will be essential.

**Shao:** To date, Japanese industry has been in the industrial vanguard around the world thanks to its proactive stance toward the introduction of new technologies. I think that, as a Japanese corporation, Denka should take a leading role in the development of novel business fields that are as yet virtually unexplored by any of our overseas counterparts. To this end, Denka should espouse a more unconventional approach, for example, developing a plant-based reagent via the application of Icon Genetics' technologies, in line with its efforts to enhance corporate value.

**Muramatsu:** About two years ago, the R&D Center underwent a reorganization and adopted a more “flat” staffing structure. This helped us speed up our development as this structure enables us to swiftly allocate staff to business units in need. In addition, we must satisfy different reagent needs by country. Diagnostic reagents needed by countries with sophisticated infrastructure, such as Europe, the United States and Japan, and those needed by emerging nations with underdeveloped infrastructure, are totally different. Furthermore, I am keeping my eye on the future possibility of reagents tailored



for individual patients, an area where pursuing unique technologies will equip us with strength in a particular area of specialty. To that end, we need to step up the coordination of a variety of technologies possessed by business units across the Denka Group.

**Arai:** Going forward, the company will push ahead with the development of new products. In step with this move, manufacturing departments are expected to enhance their production technologies. In order for us to get new businesses on a track and improve corporate value, it is important to take a proactive approach to the introduction of cutting-edge technologies and search for alternative materials so that we can make our production processes as highly efficient and cost-competitive as possible.

**Yamazaki:** When I began acting as a sales representative, the name of Denka Seiken was hardly known in the market. Since then however, the company has gradually garnered market recognition by, for example, releasing reagents made through the application of latex technologies. Today, when I visit hospitals, most of the people I meet there say they have heard the name Denka. Looking ahead, I would like to see Denka Seiken recognized by an even broader range of people as a reagent maker. I also hope that we will someday be seen as a leading company with distinctive strength in a specific field.

**\*Point of Care Testing:** Instead of requiring separate medical examination rooms for performing diagnostic tests, POCT reagents enable medical staff to quickly perform diagnoses at the frontline of their medical practices without the need for massive equipment. Denka Seiken's lineup of POCT reagents include rapid diagnostic test kits for detecting influenza virus and norovirus.



# Resource Allocations

Resource Allocations

To realize the **Denka Value-Up** management plan, we are engaged in the strategic allocation of our resources.

Executing strategic investment centered on specialty businesses, we are striving to realize “Sustained Growth” and “Sound Growth.”

With regard to shareholder returns, we remain committed to a targeted total shareholder return ratio of 50%. Simultaneously, we are placing ever stronger focus on cash dividends while flexibly carrying out share repurchases by giving due consideration to such factors as trends in stock prices.

## Investment Plan

### Policy

- We will invest a total of ¥200 billion over a five-year period.

### Breakdown

- Strategic investment: ¥75 billion (¥15 billion/year)

Of which, investment in specialty businesses (M&A, etc.): ¥60 billion

Process reform: ¥15 billion

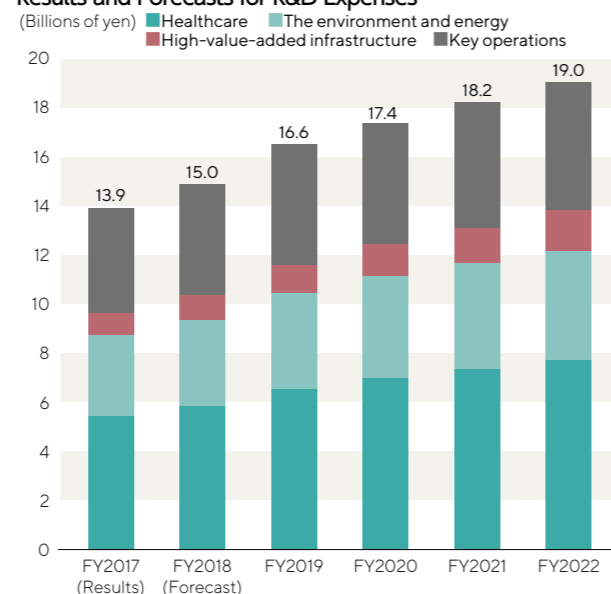
- Regular investment: ¥125 billion (¥25 billion/year)

## R&D Plan

### Policy

- We will expend a total of ¥90 billion in R&D over a five-year period.

### Results and Forecasts for R&D Expenses



## Shareholder Returns

### Policy

- We will remain committed to a targeted total shareholder return ratio of 50%.  
 › In addition to prioritizing cash dividends, we will flexibly execute share repurchases by giving due consideration to stock prices and other factors.

Note: Total payout ratio = (Dividends paid + treasury stock purchased) / consolidated net income

## Fiscal 2017 Achievements

In fiscal 2017, we paid an interim dividend of ¥50 per share and a year-end dividend of ¥55 per share. With full-year dividends totaling ¥105 per share, the dividend payout ratio stood at 40%.

## Fiscal 2017 Results

In fiscal 2017, R&D expenses for the entire Group totaled ¥13,868 million.

# Corporate Information

## Company Overview

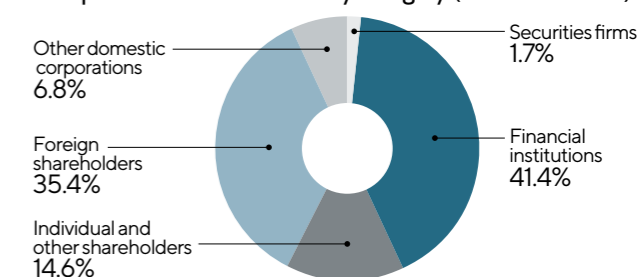
<b>Name</b>	Denka Company Limited
<b>Head Office</b>	Nihonbashi Mitsui Tower, 1-1, Nihonbashi-Muromachi 2-chome, Chuo-ku, Tokyo 103-8338, JAPAN TEL: +81-3-5290-5055 FAX: +81-3-5290-5059
<b>Established</b>	May 1, 1915
<b>Paid-in Capital</b>	¥36,998 million (As of March 31, 2018)
<b>Main business</b>	<ul style="list-style-type: none"> <li>• <b>Elastomers &amp; Performance Plastics</b> (Chloroprene rubber, styrene-based synthetic resins, styrene monomer and acetyl chemicals)</li> <li>• <b>Infrastructure &amp; Social Solutions</b> (Cement, special cement additives for concrete, fertilizers and inorganic materials as well as polymer processing products for civil engineering and agriculture use)</li> <li>• <b>Electronics &amp; Innovative Products</b> (Electronic packaging materials, functional ceramics, electronic circuit substrates, thermal materials, adhesives, acetylene black, etc.)</li> <li>• <b>Living &amp; Environment Products</b> (Polymer processing products for construction and industrial use, food packaging materials, etc.)</li> <li>• <b>Life Innovation</b> (Pharmaceutical products, etc.)</li> </ul>
<b>Employees</b>	5,944 (consolidated basis); 3,011 (non-consolidated basis) (As of March 31, 2018)

## Stock Information (as of March 31, 2018)

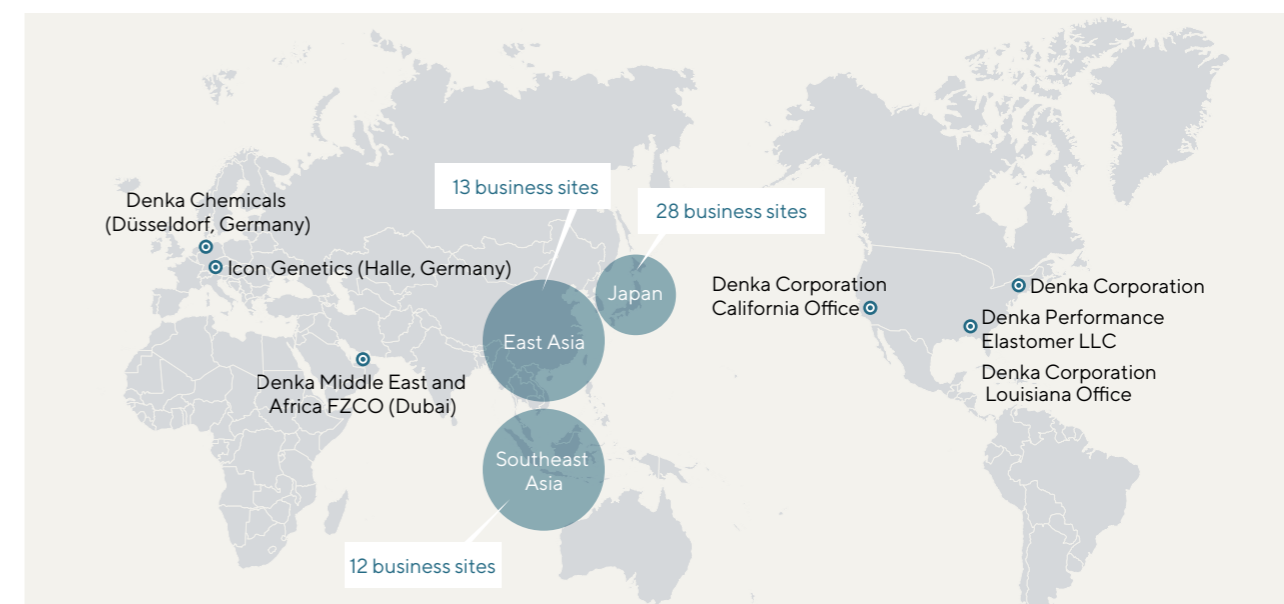
Shareholder name	Number of shares held (thousand shares)	Percentage of shares held (%)
The Master Trust Bank of Japan, Ltd. (Trust Account)	8,518	9.72
Japan Trustee Service Bank, Ltd. (Trust Account)	6,344	7.24
Trust & Custody Services Bank, Ltd. (Mizuho Corporate Bank, Ltd. Retirement Benefit Trust Account re-trusted by Mizuho Trust & Banking Co., Ltd.)	3,215	3.67
National Mutual Insurance Federation of Agricultural Cooperatives	2,759	3.15
MITSUI LIFE INSURANCE COMPANY LIMITED	2,381	2.72
STATE STREET BANK AND TRUST COMPANY 505001	2,043	2.33
Japan Trustee Service Bank, Ltd. (Trust Account 5)	1,470	1.68
Mitsui Sumitomo Insurance Company, Limited	1,383	1.58
STATE STREET BANK AND TRUST COMPANY 505103	1,290	1.47
JP MORGAN CHASE BANK 385151	1,192	1.36

Note: Percentage of shares held is calculated after excluding treasury stock.

### Composition of shareholders by category (thousand shares)



## Global Network (as of April 1, 2018)



## Consolidated Financial Statements

### Consolidated Balance Sheet (As of March 31, 2018)

Account item	(Millions of yen)		Account item	(Millions of yen)	
	(Reference) 158th term	159th term		(Reference) 158th term	159th term
<b>Assets</b>	454,944	475,086	<b>Liabilities</b>	227,456	232,305
<b>Current assets</b>	168,902	186,467	<b>Current liabilities</b>	144,190	158,044
Cash and deposits	10,258	14,115	Notes and accounts payable—trade	46,811	53,625
Notes and accounts receivable—trade	85,069	95,583	Short-term loans payable	43,492	41,100
Merchandise and finished goods	42,532	43,761	Current portion of long-term loans payable	72	634
Work in process	3,745	3,669	Current portion of bonds	10,000	15,000
Raw materials and supplies	16,907	18,870	Accounts payable—other	14,229	14,677
Deferred tax assets	2,039	2,338	Income taxes payable	3,659	5,855
Other	8,809	8,595	Accrued consumption taxes	814	1,081
Allowance for doubtful accounts	(460)	(466)	Accrued expenses	9,690	10,746
<b>Noncurrent assets</b>	286,041	288,618	Provision for bonuses	2,880	3,002
<b>Property, plant and equipment</b>	213,456	209,761	Other	12,539	12,322
Buildings	39,849	39,424	<b>Noncurrent liabilities</b>	83,266	74,261
Structures	22,132	22,111	Bonds payable	20,000	12,000
Machinery and equipment	73,761	66,947	Long-term loans payable	40,184	39,535
Vehicles	577	488	Deferred tax liabilities	5,895	6,604
Tools, furniture and fixtures	2,895	3,249	Deferred tax liabilities for land revaluation	8,405	8,403
Land	63,247	63,323	Net defined benefit liability	7,774	6,002
Lease assets	312	248	Provision for stock benefits	-	18
Construction in progress	10,679	13,968	Other	1,006	1,696
<b>Intangible assets</b>	10,342	13,880	(Net assets)	227,487	242,780
Software	1,170	1,148	<b>Shareholders' equity</b>	199,865	212,479
Goodwill	5,694	9,315	Capital stock	36,998	36,998
Right of using patent	3,477	3,417	Capital surplus	49,284	49,391
<b>Investments and other assets</b>	62,242	64,975	Retained earnings	123,752	129,278
Investment securities	54,604	58,178	Treasury stock	(10,170)	(3,189)
Long-term loans receivable	664	552	<b>Accumulated other comprehensive income</b>	23,700	26,584
Long-term prepaid expenses	2,789	2,122	Valuation difference on available-for-sale securities	14,837	17,448
Deferred tax assets	1,608	1,482	Deferred gains or losses on hedges	-	(195)
Other	3,399	2,779	Revaluation reserve for land	10,265	10,260
Allowance for doubtful accounts	(823)	(139)	Foreign currency translation adjustment	1,496	1,241
<b>Total</b>	<b>454,944</b>	<b>475,086</b>	Remeasurements of defined benefit plans	(2,898)	(2,170)
			<b>Non-controlling interests</b>	3,922	3,717
			<b>Total</b>	<b>454,944</b>	<b>475,086</b>

Note: Amounts are rounded down to the nearest million yen.

### Consolidated Statement of Income (From April 1, 2017 to March 31, 2018)

Account item	(Millions of yen)			
	(Reference) 158th term	159th term		
<b>Net sales</b>		362,647		395,629
<b>Cost of sales</b>		273,263		295,583
Gross profit		89,383		100,046
Selling, general, and administrative expenses		63,539		66,394
Operating income		25,844		33,652
<b>Non-operating income</b>				
Interest and dividend income	1,428		1,681	
Equity in earnings of affiliates	568		1,105	
Other	640	2,637	702	3,488
<b>Non-operating expenses</b>				
Interest expenses	820		707	
Other	4,502	5,322	4,933	5,641
Ordinary income		23,158		31,499
<b>Extraordinary income</b>				
Loss on sales of investment securities	683	683	-	-
<b>Extraordinary loss</b>				
Loss on liquidation of business	1,356	1,356	1,928	1,928
Income before income taxes		22,486		29,571
Income taxes—current	5,133		7,280	
Income taxes—deferred	(464)	4,669	(933)	6,347
Profit		17,816		23,224
Profit (loss) attributable to non-controlling interests		(329)		188
<b>Profit attributable to owners of parent</b>		<b>18,145</b>		<b>23,035</b>

Note: Amounts are rounded down to the nearest million yen.

## Consolidated Statement of Changes in Net Assets (From April 1, 2017 to March 31, 2018)

(Millions of yen)

	Shareholders' equity				
	Capital stock	Capital surplus	Retained earnings	Treasury stock	Total shareholders' equity
Balance at beginning of the fiscal year	36,998	49,284	123,752	(10,170)	199,865
Changes of items during the fiscal year					
Dividends from surplus			(7,481)		(7,481)
Profit attributable to owners of parent			23,035		23,035
Change of scope of consolidation			(2)		(2)
Change in ownership interest of parent due to transactions with non-controlling interests		107			107
Purchase of treasury stock				(3,053)	(3,053)
Disposal of treasury stock		0		1	1
Retirement of treasury stock		(0)	(10,033)	10,033	-
Reversal of revaluation reserve for land			7		7
Net changes of items other than shareholders' equity					-
Total changes of items during the fiscal year	-	107	5,526	6,980	12,614
Balance at end of the fiscal year	36,998	49,391	129,278	(3,189)	212,479

(Millions of yen)

	Accumulated other comprehensive income						Non-controlling interests	Total net assets
	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Revaluation reserve for land	Foreign currency translation adjustment	Remeasurements of defined benefit plans	Total valuation and translation adjustments		
Balance at beginning of the fiscal year	14,837	-	10,265	1,496	(2,898)	23,700	3,922	227,487
Changes of items during the fiscal year								
Dividends from surplus						-		(7,481)
Profit attributable to owners of parent						-		23,035
Change of scope of consolidation						-		(2)
Change in ownership interest of parent due to transactions with non-controlling interests						-		107
Purchase of treasury stock						-		(3,053)
Disposal of treasury stock						-		1
Retirement of treasury stock						-		-
Reversal of revaluation reserve for land						-		7
Net changes of items other than shareholders' equity	2,611	(195)	(5)	(254)	728	2,883	(204)	2,678
Total changes of items during the fiscal year	2,611	(195)	(5)	(254)	728	2,883	(204)	15,292
Balance at end of the fiscal year	17,448	(195)	10,260	1,241	(2,170)	26,584	3,717	242,780

Note: Amounts are rounded down to the nearest million yen.

## Consolidated Statements of Cash Flows

(Millions of yen)

	Fiscal Year Ended March 31, 2017	Fiscal Year Ended March 31, 2018
<b>Cash flows from operating activities</b>		
Income before income taxes	22,486	29,571
Depreciation	24,047	23,860
Amortization of goodwill	311	738
Increase (decrease) in provision for bonuses	138	120
Increase (decrease) in net defined benefit liabilities	(539)	(722)
Increase (decrease) in allowance for doubtful accounts	298	(680)
Interest and dividend income	(1,428)	(1,681)
Interest expenses	820	707
(Gains) losses on equity in affiliates	(568)	(1,105)
(Gains) losses on valuation of investment securities	18	394
(Gains) losses on sales of investments in securities	(672)	(79)
(Gains) losses on sales and disposals of property, plant and equipment	1,083	176
Losses on business restructuring	-	1,928
(Increase) decrease in notes and accounts receivable	(9,286)	(10,485)
(Increase) decrease in inventories	781	(3,424)
Increase (decrease) in notes and accounts payable	5,065	8,010
Other	19	5,175
Subtotal	42,578	52,504
Interest and dividends received	2,146	2,068
Interest paid	(820)	(633)
Income taxes (paid) refunded	(4,346)	(5,163)
Net cash provided by (used in) operating activities	39,557	48,776
<b>Cash flows from investing activities</b>		
Purchases of property, plant and equipment	(22,037)	(24,981)
Proceeds from sale of property and equipment	95	7
Purchase of intangible assets	(546)	(388)
Purchase of investment securities	(1,083)	(34)
Proceeds from sale of investment securities	1,177	166
Purchase of investments in subsidiaries	-	(4,296)
Purchase of investments in subsidiaries resulting in change in scope of consolidation	(2)	-
Other	137	228
Net cash provided by (used in) investing activities	(22,258)	(29,298)
<b>Cash flows from financing activities</b>		
Increase (decrease) in short-term loans payable	(4,489)	(2,206)
Proceeds from long-term loans payable	11,975	-
Repayment of long-term loans payable	(18,330)	(86)
Cash dividends paid by the Company	(6,228)	(7,481)
Proceeds from issuance of bonds	-	7,000
Payment for redemption of bonds	-	(10,000)
Cash dividends paid to non-controlling interests	(25)	(25)
Payment for purchase of treasury stock	(2,200)	(3,053)
Other	(19)	(4)
Net cash provided by (used in) financing activities	(19,319)	(15,858)
Effect of exchange rate changes on cash and cash equivalents	(53)	57
Net increase (decrease) in cash and cash equivalents	(2,073)	3,676
Cash and cash equivalents at beginning of year	11,813	10,174
Increase (decrease) in cash and cash equivalents from newly consolidated subsidiaries	434	250
Cash and cash equivalents at end of year	10,174	14,101

Note: Amounts are rounded down to the nearest million yen.