

Integrated Report
SHOWA DENKO Report
2021

In April 2020, Showa Denko K.K. made former Hitachi Chemical Co., Ltd. (currently Showa Denko Materials Co. Ltd.) a consolidated subsidiary, and started on the path to integrate the two companies. We have been steadily moving forward with integration processes, formulating the long-term vision for the newly integrated company (announced in December 2020), facilitating substantive integration of management structures and systems, and setting milestones to complete the integration as a legal corporate entity in January 2023.

Purpose of newly integrated company

Change society through the power of chemistry

Contribute to the sustainable development of global society
by creating functions required of the times
as an advanced material partner

Ideal state of newly integrated company

Company with a strong presence in the global market
Company that contributes to a sustainable global society

Editorial policies

The Showa Denko Group restructured its CSR report and annual report in 2017 to publish the Showa Denko Report as an integrated report. In the 2021 report, we introduce the ongoing project of integrating Showa Denko and Showa Denko Materials, focusing on visions, strategies and activities underway.

As for disclosure items, we analyzed our stakeholders' opinions and requests and covered priority topics, focusing on action policies and performance in 2020 and giving specific examples. On our website, the online version of the report is also available with more details about the Showa Denko Group's activities, including updated information and environmental and social activity reports from each plant.

Report scope

Period covered by this report

This report covers information for the period from January 1 to December 31, 2020, with some information also provided for 2021.

Publication date

August 2021

Guidelines/guidance referenced

ISO26000 2010

GRI Sustainability Reporting Standards 2016

Environmental Reporting Guidelines 2018 from the Ministry of the Environment of Japan

The International Integrated Reporting Framework from the International Integrated Reporting Council (IIRC)

Guidance for Collaborative Value Creation from Ministry of Economy, Trade and Industry of Japan

Final Report Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) from Task Force on Climate-related Financial Disclosures

SASB Standards from Sustainability Accounting Standards Board Industries Chemicals

Third-party verification of sustainability-related data

Data disclosed by Showa Denko is subject to external verification every year.

For details, please refer to the relevant webpage.

Web indicators

In this report, a number of items are accompanied by links to the related website, indicated by  WEB. Click on this symbol to go to the specified website.

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GOAL FOR OUR NEWLY INTEGRATED COMPANY

Kohei Morikawa

President and CEO
Showa Denko K.K.

Hisashi Maruyama

President and CEO
Showa Denko Materials Co., Ltd.

In this dialogue, President Morikawa of Showa Denko K.K. and President Maruyama of Showa Denko Materials talk about the significance of integrating the two companies, the purpose of the newly integrated company, and their ideas for the integration.

Commitments incorporated into the purpose, “Change society through the power of chemistry”

MORIKAWA First of all, toward the integration, I thought it necessary to clarify the purpose of the newly integrated company—why the company exists and why employees work for the company—and share the purpose with employees and other stakeholders.

With the slogan, “Change society through the power of chemistry,” we are committed to creating the functions needed in the current age as an advanced material partner of our customers and to contributing to the sustainable development of global society.

When I was at senior high school, chemistry impressed me with its power to create something that did not exist in nature. This was why I decided to specialize in chemistry. I wanted to incorporate this idea about chemistry into the slogan to show the purpose.

In order to change society through the power of chemistry, our company needs to be large enough to change society and capable of fulfilling the related responsibilities. Showa Denko was able to announce the purpose with great confidence thanks to the integration of the former Hitachi Chemical (presently Showa Denko Materials).

At present, for the solution of environmental and social issues, there are calls to act for the achievement of the SDGs across the world. Accordingly, the need to renew digital infrastructure as well as mobility, energy and other socially important infrastructure is also increasing. Under such circumstances, expectations for us to generate innovation as a manufacturer of materials are greater. We will work to meet such social needs and the expectations of our customers in a straightforward manner through the integration.

MARUYAMA We are creating new functions that are needed by society. For example, semiconductors and computers would not work without sufficient conductivity. Batteries will soon die unless high-performance anode materials are used in them. Also, automobiles would waste energy when their weight is not reduced. The power of chemistry is thus indispensable to create the functions that people rely on in their everyday lives. We can contribute to providing functions that are useful to society by manufacturing materials and components that support the functionality of the finished products that use them.

We will create value that satisfies all our stakeholders, including not only customers but also shareholders, business partners, local communities and employees. We regard this as our mission. We will never be able to fulfill our purpose unless we maintain our commitment to providing all our stakeholders with value.



For details, please see
“Portfolio management for
sustainable growth” on page 29.

Conglomerate premium

Means the enhancement of corporate value through synergy effects generated by the management of multiple businesses by a single company.

The Showa Denko Group has the largest global market share for high-purity gases and ceria-based slurries, which are indispensable for wafer processing in the semiconductor front-end process.

Also, for materials used in the semiconductor back-end process (packaging), the Group has the largest global market share for die-bonding films and photosensitive films and the second largest for copper-clad laminate boards (for substrates) and for encapsulation materials. (Source: Researched by Showa Denko)

Significance of the integration

MORIKAWA The new business portfolio created through the integration will enable us to enjoy a conglomerate premium. Whether or not a company can become an entity with a conglomerate premium depends on the size of its growth businesses and also on the expansion of its fundamental businesses to include new business areas, which in turn enhances the comprehensive ability of the conglomerate group.

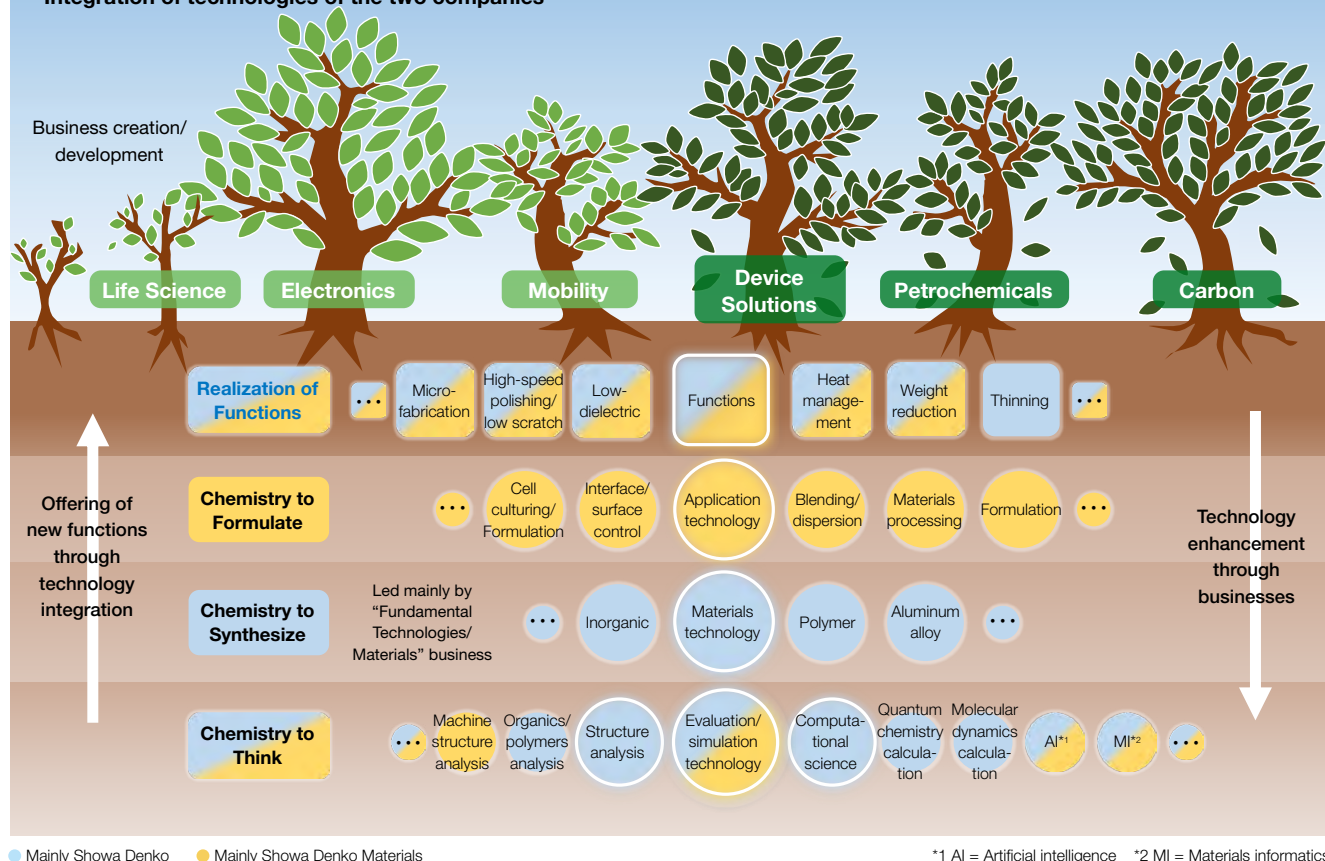
Generally, conglomerate management tends to be underestimated. One of the factors that contribute to such underestimation is the lack of a growth business that is big enough to lead the conglomerate to conduct a range of businesses. For example, if a company posts sales of ¥50 billion and all of those sales are attributable to one growth business, it can be said that the company has high growth potential. However, if a company that conducts multiple businesses and posts sales of ¥1 trillion as a whole has a growth business with sales of ¥50 billion, it would be impossible for the business to lead the entire entity. In our case, through the integration, we were able to post sales of about ¥230 billion in the “Electronics,” “Mobility” and “Life Science” fields. We will further increase sales in these three growth businesses to the ¥600 billion level by 2030. In the electronics (semiconductor materials) business in particular, products for which we are ranked in the top three in terms of global market share account for about 85% of total net sales, and we are thus a big player in the market.

In addition, unlike other businesses for which our target markets are clearly defined, in the fundamental businesses we can target a wider range of markets (for semiconductors, construction materials, infrastructure, daily necessities, etc.) and so can make better use of the features of our products through market expansion. This will help enhance the Group’s comprehensive ability and help us further develop our growth businesses.

MARUYAMA In the illustrative diagram that shows the synergies generated by the newly integrated company, we depict soil and trees as metaphors for the new company that the Showa Denko Group aims to create: a hybrid advanced material company combining midstream materials technology and downstream application technology.

Some might pay attention first to the trees, for example, focusing on how large the trees are in the diagram. However, what is notable here is the soil. It is essential to input nutrients into the soil so that the trees emerging out of the ground will thrive and grow into the types of trees that meet the needs of today’s world.

Integration of technologies of the two companies



The fundamental (technologies/materials) businesses create tremendous value by making technological contributions to the development of "trees" (products including components for semiconductors), and inorganic, organic, aluminum and various other technologies support the trees as their "roots," which need the "soil" to create innovation and new value. The soil provides us with a source of competitive advantages.

MORIKAWA Nutrients contained in the soil are not meant for human beings to eat, and we need to make effective use of the nutrients to grow crops. By increasing the fertility of the soil, we can also grow a wider variety of trees. We therefore attribute importance to basic chemistry, which for us is the soil. It is also important to keep up the cycle of using fruit that has fallen from the trees as new nutrients.

MARUYAMA When the former Hitachi Chemical decided to leave the Hitachi Group, one of the options offered to the company was to integrate with a company conducting businesses similar to its own. However, integration with a company that had many businesses and technologies similar to ours would not put us on the path to any great evolution. We therefore thought it necessary to integrate with a company with which we would be mutually complementary, which would in turn help us expand our existing businesses and technologies.



Through the integration of the two companies, a company engaging in chemistry to "synthesize, formulate and think" will be born and, through its business portfolio, the newly integrated company will be able to create tremendous added value.

Due diligence

Means to examine the value, risks and other elements of candidate investee companies and organizations when making investment decisions.

In light of the fact that the application technology that we have in the downstream section of the value chain is prone to market changes, we wanted to enhance our materials technology in the upstream section of the value chain. Integration with Showa Denko meets this requirement and is quite meaningful in regard to “Change society through the power of chemistry.”

MORIKAWA The two companies are indeed much aligned in terms of corporate direction and approach. For example, when President Maruyama made a presentation in the due diligence process, I thought that I would have made the same presentation if I had been making a presentation on Showa Denko and felt a strong sense of affinity. I was particularly impressed when President Maruyama said, “We are not a manufacturer of semiconductor materials. It is only an outcome. The materials that we produce happen to be used in semiconductors.” Indeed, we are not aiming to become a manufacturer of materials for specific products. It is ideal that we grow various types of trees in the soil. The trees that we are now growing might become unable to draw nutrients from the soil and as a result wither. We therefore need to have soil that is fertile enough for new trees to spontaneously emerge from it.

MARUYAMA Investors with whom we have dialogues for the first time tend to evaluate our businesses from the aspect of products. Some of them also make the point that we conduct too many different kinds of businesses and should focus on just some of them. For us, however, products are just an outcome of what we do in our business, which is to make, mix, coat and paste materials to create new functions. And at present, the materials that we produce happen to be used mainly as semiconductor materials. I think that the products in which our materials are used will change with the times. I want our company to continue to provide new functions through the provision of materials.

Showa Denko and Showa Denko Materials have nothing in common in terms of the products that represent the outcomes of their business activities, and some might think that the integration will generate no synergy effects. However, the integration will help us expand our business operations in a vertical and also in an effective manner. The two companies have technologies that fit together, enabling us to become a one-stop advanced material partner for customers. The companies share few technological fields, and so the integration substantially enriches the “soil.”

Contributing to the SDGs while increasing corporate value

MORIKAWA By defining our purpose, we can now more spontaneously link the creation of a sustainable society with the growth of Showa Denko. The company can now contribute to a sustainable society and keep itself sustainable in an even more compatible manner.

MARUYAMA We used to relate our existing businesses to the specific goals of the SDGs, but it is

The two companies are well suited to each other technologically. We will become a one-stop advanced material partner that can contribute to customers and society.



GOAL FOR OUR NEWLY INTEGRATED COMPANY

Plastic chemical recycling

In the plastic chemical recycling business, plastic waste is gasified at a high temperature to be converted into hydrogen and carbon dioxide. The produced hydrogen is mainly used as a material to make ammonia and carbon dioxide as a material for dry ice and carbonated drinks.



For details, please see
“Initiatives for an Advanced
Recycling-Based Society” on
pages 35 and 36.

more important to understand that we can make social contributions through our businesses and our company and to consider how to create value based on this recognition. Employees’ awareness of the SDGs is also changing.

MORIKAWA Chemistry can help create a sustainable society. We are conducting activities to reduce the environmental impact of our products throughout their life cycles, including in the manufacturing, use and disposal stages. In the disposal stage in particular, I think chemistry can make a great contribution.

For example, ammonia can be used as fertilizer, helping food production. It is also used to render harmless nitrogen oxides (NOx), an air pollutant, at thermal power plants. Showa Denko is promoting the plastic chemical recycling business to produce ammonia from used plastics. The recycling technology to generate ammonia from used plastics, the reduction of which is becoming a social challenge, is increasing the value of the produced ammonia.

MARUYAMA Now, for the creation of a carbon-neutral society, we need to ask our customers and business partners to cooperate with us for the reduction of CO₂ emissions. We should discuss what society can do as a whole to reduce CO₂ emissions. We must reduce CO₂ emissions even if it costs us.

For the newly integrated company

MORIKAWA We will integrate the two companies as a corporate entity in 2023. In July 2021, we newly established Preparation Offices for various business headquarters and CXOs of the newly integrated company, with a view to promptly establishing a system for world-class business management. From now on, the newly appointed heads of the Preparation Offices will lead the examinations about the integration-related issues.

MARUYAMA Since 2021, while implementing all necessary preventive measures against COVID-19, I have been visiting the sites of the two companies together with President Morikawa in order to brief on-site employees on our long-term vision and have dialogues with them. At each site, employees expressed their opinions proactively, and I feel that our employees are ready and willing for the integration to go ahead. Due to the state of emergency declarations made by the government, we had to cancel and reschedule the visits repeatedly, and I would like to have more opportunities to communicate with employees.

MORIKAWA I want employees to understand that their companies are in the process of becoming a totally new company and that the integration of A and B should not lead to the birth of AB but of X. The integration is giving us an opportunity to become a global top-level functional chemical manufacturer, and I want all employees to be equally committed to reaching the summit.

However, the burst of reinvigoration that is produced by the birth of a new company does not last forever. Changes produced by a stimulus will help you achieve growth, but the timeframe is limited. We will therefore work to achieve the growth within one year.

MARUYAMA We have a very rare opportunity to create a new company. I want employees of the two companies to think about the best practices to be implemented to achieve our future vision, proactively discuss them with one another, and enjoy the process of creating a new company. We have a bright future! I want employees to cause creative frictions.

We are also conducting examinations about the identity of the newly integrated company together with employees under the Future Design Project. Based on the purpose shown in the long-term vision, employees are expressing their opinions about the value that we should maintain and further enhance.

MORIKAWA Based on the long-term vision, employees of the two companies are conducting examinations and heading in the same direction. I want them to build up the new company with a strong sense of ownership, and not in a top-down manner but in a participatory one. This will help them increase their understanding about the new company.

MARUYAMA It really is important that all employees understand the identity. We will carefully implement the process to help employees understand what we have decided, in addition to implementing the processes to examine and document the identity.

MORIKAWA We will press forward with the integration process in a meticulous and also speedy fashion and present the results to our stakeholders in a tangible manner. We hope you will look forward to and provide support for the future of the Showa Denko Group.

TOPICS: Building corporate culture

Ahead of the launch of the new company resulting from the integration of Showa Denko and Showa Denko Materials that is scheduled for January 2023, employees from the two companies are jointly promoting various preparation activities. This column reports on two ongoing projects aimed at building an organizational culture befitting the new entity based on what has been established over many years at each company.

01 Future Design Project for newly integrated company

The Future Design Project was started in February 2021 with the intention of considering the concept of values and corporate mission to be shared within and outside the new company in the future. Many employees and members of the management team participate in the project from around the world.

The relevant procedure consists of three steps: (1) individual interviews held with members of the management team to select an appropriate volume of candidate elements to compose mission statements; (2) online workshops for employees to share views about future visions of the company and their aspirations; and (3) the management team's workshops, which are based on results of the employee-led workshops and held to lay out plans to establish the corporate mission, value system and other principles that will guide all activities of the new company.

Online workshops

Online workshops took place to enable employees from around the world to participate in discussions in order to clarify their attitudes regarding the values to be respected by employees of the new company and their views on the new company's long-term vision. Discussions were held in Japanese, English and Chinese, and on both an individual and a group basis, to examine the following three questions: (1) What do you find most appealing or interesting about the long-term vision? (2) What kind of values should be respected by the new company? (3) What kinds of challenges are you looking for in the new company?



Online workshop held in April 2021

Summarized comments given by participants

- I am intrigued by the concept of integrating "Chemistry to Synthesize," "Chemistry to Formulate" and "Chemistry to Think," which will likely draw public attention.
- I believe that through integration Showa Denko and Showa Denko Materials will achieve greater synergy than would be obtained by a simple addition of the two entities.
- Sustainable development is a key to continuing to be a company that has a strong presence and is needed by society.
- The size of the resulting group is not very important. What is important is to offer products unique to the reorganized Showa Denko Group.
- I have been greatly inspired by the purpose statement: "Change society through the power of chemistry." This is very uplifting.
- To achieve the purpose, embracing challenges is imperative. The company should encourage and acknowledge efforts to tackle challenges, including those which may eventually fail.
- It will be a huge challenge to manage the integrated organization, which will be more than twice as big, while building capabilities to offer one-stop solutions. To address this, we should work to build a strong sense of cooperation.

02 Becoming a solution partner that exceeds customers' expectations and imagination

Showa Denko and Showa Denko Materials promote initiatives aimed at increasing customer satisfaction through providing solutions that exceed their customers' expectations and imagination. These initiatives, specifically, CX at Showa Denko and WOW-BB at Showa Denko Materials, which were pursued independently in the past, will be integrated by 2023. Ahead of this, employees from the two companies have begun to participate in each other's activities to understand and enhance the initiatives in preparation for the scheduled integration.

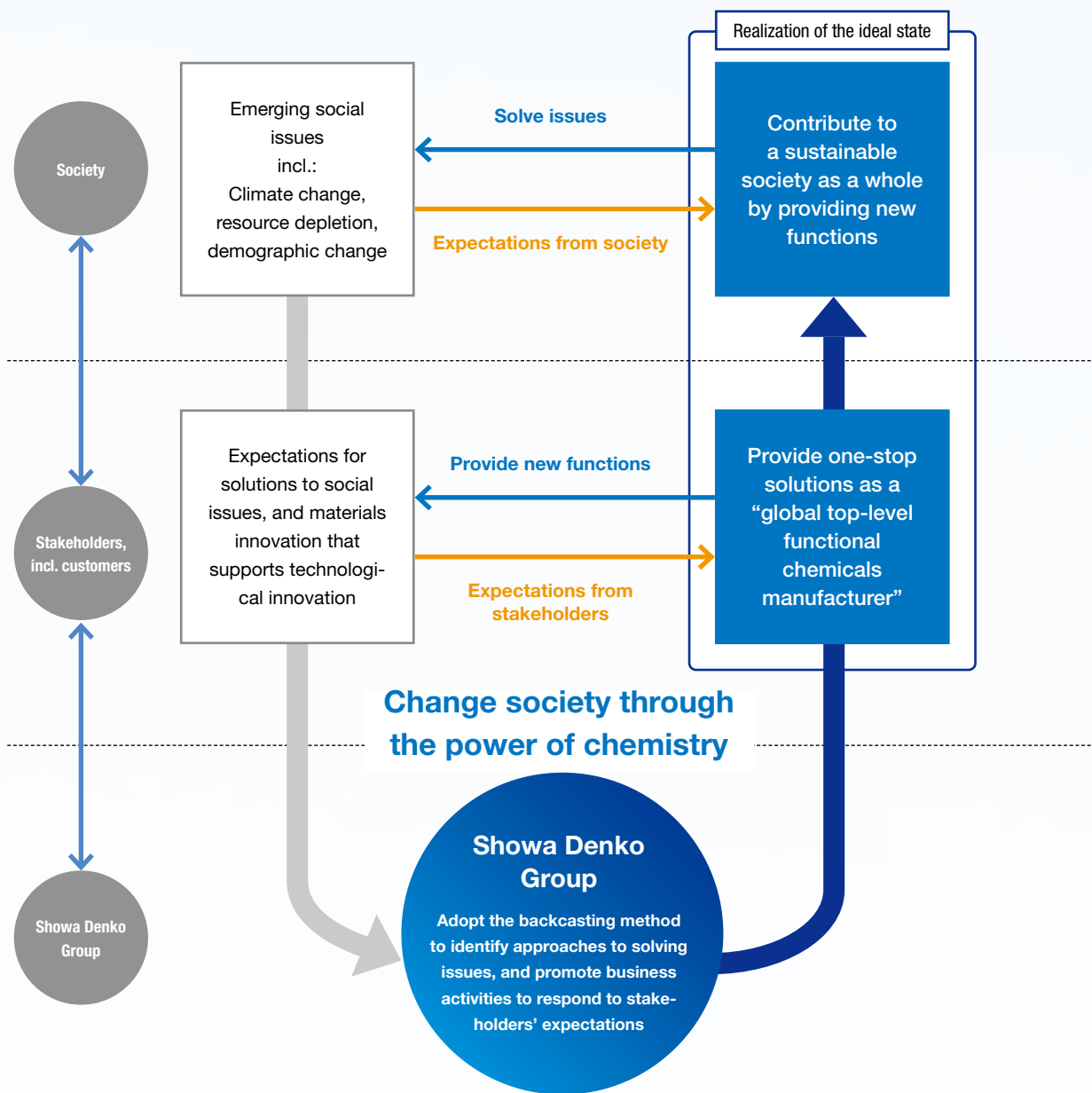
Objective of initiative	Common goal	Details of activities
Showa Denko CX Endeavor to maximize "CUSTOMER Experience (CX*)" in an effort to become a KOSEIHA Company *1 Customer experience: Customer value based on emotional responses to products and services available for purchase, such as satisfaction and pleasure, which derive from a psychological experience that is not necessarily related to prices, functions or other factual conditions.	Provide solutions that exceed customers' expectations and imagination	The Showa Denko Group's vision (goal) is to become a KOSEIHA Company, or an aggregate of KOSEIHA Businesses. In order to achieve this vision, we are working to maximize CUSTOMER Experience (CX). Starting from 2019, the Group runs programs through distributed videos and workplace discussions to enhance internal understanding of the importance of maximizing CX. In 2021, the Group announced the CX Maximization Declaration 2021 SMILE and launched the CX Global Award based on the declaration in order to move on to phase 2 to enhance the understanding of CX and related actions.
Showa Denko Materials WOW-BB Cross-organizational company-wide efforts to provide wowing solutions that surpass the expectations of customers and society (Working On Wonders Beyond Boundaries [WOW-BB])		The Showa Denko Materials Group promotes the WOW-BB initiative to encourage individuals and the Group as a whole to overcome limitations chiefly arising due to sectionalization (Beyond Boundaries) in order to work together and provide impressive solutions that surpass the expectations of customers (Working On Wonders). This initiative is driven by two major programs: the 10-Year Strategy directed at sustainable growth and the WOW Global Award launched to foster a culture of embracing challenges. The award calls for team entries for any one of the five specified challenges^{*2}, and selected team activities are evaluated based not only on achievement against goals set but also actions for and contribution to changing the corporate culture. *2 Five challenges: (1) Become able to identify customer needs; (2) Envision the future; (3) Create new core technologies; (4) Become a world-leading company; and (5) Invent workstyles encouraging cooperation.

A full-page background image showing a man and a young boy on a lush green grassy hill. The man, wearing a light-colored shirt and jeans, is holding a string and looking up at a colorful kite flying high in a clear blue sky. The boy, wearing an orange shirt and jeans, is running towards the left. The kite is multi-colored with red, yellow, green, and blue sections. The scene is bright and sunny, suggesting a pleasant day outdoors.

Aiming to become a company with a “strong presence in the global market” that “contributes to a sustainable global society”

The global population is continuing to grow, and is expected to reach 10 billion by 2050. Humans should therefore create an advanced society that can ensure the well-being of all its members while utilizing energy and other resources in a sustainable manner to support the growing population. We are committed to serving this objective.

We will work to meet our stakeholders’ expectations for innovation of advanced materials technologies by demonstrating the “power of chemistry” in various ways to invent new functions in response to the needs of the times, thereby helping solve many different challenges facing the world at large. Thus, we will contribute to sustainable global development while aiming to achieve the sustainable growth of the Group.



For details on challenges to realize carbon neutrality and SDGs initiatives, please see pages 32 to 37.



Challenges to realize carbon neutrality



Initiatives aimed at advanced recycling-oriented society



Contribution to increasing QOL

Corporate governance for integrated company

In order to gain the trust of stakeholders in the Group that is to be reorganized in conjunction with the planned integration of Showa Denko and Showa Denko Materials, we will establish an appropriate corporate governance system and improve it as required.

To promote the integration project, each of the two companies have assigned representatives to form a number of joint bodies, including two steering committees. The steering committees are engaged in ongoing deliberations on important group management policies for the new organization (Steering Committee 1) and practical plans to implement the integration (Steering Committee 2).

To continue to advance the integration project, deliberation functions have been delegated to preparation offices set up in July 2021 to establish new business headquarters and CXO positions, and performed under the leadership of the newly selected head of each preparation office.

Future (January 2023)

Newly integrated company

Re-establish corporate governance systems for the reorganized group including the new company



Integration project structure (as of July 2021)

Showa Denko Board of Directors

Supervision

Steering Committee 1

Composed of presidents and Board members from the two companies
Responsible for discussions and decisions on important group management policies for the new organization

Steering Committee 2

Composed of heads of business divisions from the two companies
Responsible for discussions and decisions on practical plans to implement the integration

Corporate working group

- Finance/accounting
- IT
- Strategy planning
- Personnel affairs
- Branding
- Risk management
- IP/R&D
- Quality assurance/environment/safety
- Production technologies
- Marketing
- Purchasing/logistics

Business Divisions



The integration project structure for Showa Denko and Showa Denko Materials was reorganized, effective July 1, 2021, so that relevant deliberation functions would be performed by preparation offices set up within the head office of Showa Denko to establish new business headquarters and CXO positions, under the leadership of the newly selected head of each office.



Read messages concerning corporate governance issues from the chairman of the Board, an outside director and an outside member of Audit & Supervisory Board, which are available on pages 65-67.



Hideo Ichikawa
Chairman of the Board



Masaharu Oshima
Outside Director



Kiyomi Saito
Outside Member of Audit & Supervisory Board

History Leading up to Integration

Through integration, Showa Denko and Showa Denko Materials (former Hitachi Chemical) will bring midstream materials and downstream application technologies together within a single corporate group. As an integrated entity, we will maximize the resultant synergetic effects in order to continuously create new functions in response to the needs of the times for advanced materials, thereby contributing to the sustainable development of society.

Showa Denko

Originating in the field of electrochemistry, Showa Denko has developed its technological capabilities over the course of years to expand into the fields of inorganic chemistry, organic chemistry and metal materials. Many of its past technological achievements have been passed down to serve the development of a wide variety of products in use today, including materials and components used for automobiles and IT equipment as well as essential daily items.

1908

Established Sobo Marine Products K.K. (later Nihon Iodine K.K.) to manufacture and sell iodine

1931

Started production of ammonium sulfate using domestic technology (Showa Fertilizers K.K.)

1934

Industrialized domestically produced aluminum (Nihon Iodine K.K.)



Successfully promoted the domestic production of ammonium sulfate and aluminum, while working to facilitate "use of electricity as a material" and "development of domestic technologies"

1939

Established Showa Denko K.K. through the merger of Showa Fertilizers and Nihon Electrical Industries

1945

Resumed production of ammonium sulfate fertilizer

1951

Achieved domestic production of synthetic resin emulsion (Showa Highpolymer Co., Ltd.)

1953

Achieved domestic production of unsaturated polyester resin (Showa Highpolymer Co., Ltd.)

1965

Achieved domestic production of vinyl ester resin (Showa Highpolymer Co., Ltd.)

1969

Oita Petrochemical Complex started commercial operation



First in Group to be capable of integrated manufacturing of diverse range of petrochemical products, such as polyethylene, polypropylene and acetic acid

1986

Started production and sale of aluminum cylinders (Showa Aluminum Corporation)

Showa Denko Materials

(Former Hitachi Chemical Company, Ltd.)

Showa Denko Materials' core competence is grounded in a wealth of technical knowledge originating from the founding company's four major products (insulating varnish, laminate, electrical insulation, carbon brushes) and built up to cover an extensive range of organic and inorganic chemicals. The knowledge has been employed and processed in ingenious ways to innovate a broad spectrum of materials and products.

1912

Started research into electrical insulating varnishes aiming at domestic production (origin of Showa Denko Materials)



Started research into insulating varnish for electrical motors aiming at domestic production

1930

Started trial production of phenol resin laminates

1931

Started trial production of porcelain insulators

1933

Started trial production of carbon brushes

1955

Started production of copper-clad laminates for multilayer PWBs



Developed technique to enable complicated wiring on a single copper-clad laminate board, which facilitated mass production of electronic circuits, a key contributor to popularization of commercial television and radio system

1974

Started production of pharmaceutical, MS-antigen

1978

Started sale of photosensitive film of alkali-based solvents

1984

Started production of circuit connecting film for displays



Developed anisotropically conductive circuit connection films, an innovation that enabled mass production of high-definition LCD screens

● **1988**

Entered the hard disk business



Employed the sputtering (thin-film forming) method, a challenging technical option, to manufacture HD media, anticipating future demand for larger storage capacity

● **2001**

Merged Showa Aluminum Corporation

● **2003**

Started plastic chemicals recycling business



Processed used plastics to recover gas to use as material for hydrogen, ammonia, soda, dry ice and other products, looking to contribute to a recycling-based economy

● **2009**

Started production of cooling devices for power semiconductors



Developed cooling devices for semiconductors applying Showa Denko's proprietary thermal design technology and aluminum processing technique

● **2010**

Merged Showa Highpolymer Co., Ltd.

● **2016**

Established a joint venture in Korea for semiconductor processing high-purity gas production

● **2017**

Acquired SGL GE, a German graphite electrode supplier



Acquired the graphite electrode business to promote global development

● **1992**

Started sale of reflow-resistance epoxy molding compounds

● **1998**

Started high-volume production of carbon anode materials for lithium-ion batteries

Started production of CMP slurries for STI (shallow trench isolation)



Developed proprietary cerium oxide particles to achieve high-speed polishing (smoothing) in order to increase productivity

● **2001**

Started production of molded plastic rear modules



Succeeded in manufacturing molded plastic rear door modules for the first time in Japan by the resin molding technology nurtured over many years

● **2008**

Started production of allergy diagnostic reagents for simultaneous measurement of 33 items

● **2017**

Started contract development and manufacturing organization for regenerative medical products



Built global supply systems to promote businesses for contract development and manufacturing organization for regenerative medical products, thereby contributing to increased availability of regenerative medicine

2023

**Full integration
as a corporate
entity**

Showa Denko Group's Business Overview

(2020 results)

Showa Denko Materials Co., Ltd. and its subsidiaries were included in the scope of consolidation from the second quarter of 2020. Accordingly, a new reporting segment was added and the relevant net sales and income/loss began to be reflected in reporting from the third quarter of 2020.

Total assets

¥2,203.6 billion

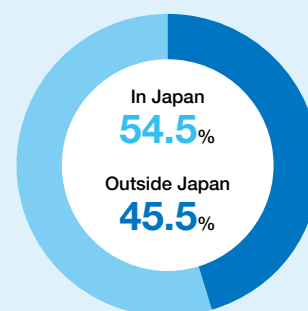
204.7% YoY

Consolidated net sales

¥973.7 billion

107.4% YoY

Net sales ratio



7 business segments

Figures for estimate, shares and order volume are based on surveys by Showa Denko.

Petrochemicals

Raw materials for plastics, synthetic rubber, etc.

Sales

¥193.4 billion

Operating income

¥4.9 billion

Ethylene

Japan's No. 1 material diversification rate



To produce ethylene, which is used as a material for various petrochemical products, we use materials other than naphtha in order to make effective use of resources and achieve high cost competitiveness.

Chemicals

Raw materials for chemicals; semiconductor-processing specialty gases; raw materials for fibers, industrial gases, etc.

Sales

¥155.8 billion

Operating income

¥13.5 billion

High-purity gases for semiconductor processing (NH₃, C₄F₈, HBr, etc.)



The world's No. 1 market share

We produce more than 20 types of high-purity gases including ammonia, chlorine, fluorine and other substances for use in semiconductor, LCD, LED and solar cell production.

Electronics

Hard disk media, lithium-ion battery materials, SiC epitaxial wafers, etc.

Sales

¥97.4 billion

Operating income

¥9.1 billion

Hard disk media

The world's No. 1 manufacturer/seller



Our advanced technology for hard disk media (recording media for hard disk drives [HDDs]) is able to increase the storage capacity of HD media to meet expanding information loads and the spread of cloud computing.

Inorganics

Graphite electrodes (for electric steelmaking), abrasives, etc.

Sales

¥82.9 billion

Operating income

-¥32.3 billion

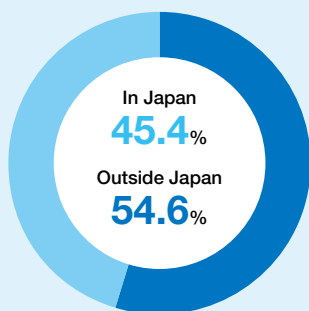
Graphite electrodes

The world's No. 1 for high-quality large-diameter electrodes



Graphite electrodes are used in electric furnaces in which iron scrap is melted down and recycled into steel. Showa Denko's graphite electrodes offer the world's highest-level electrode consumption rate and fracture resistance.

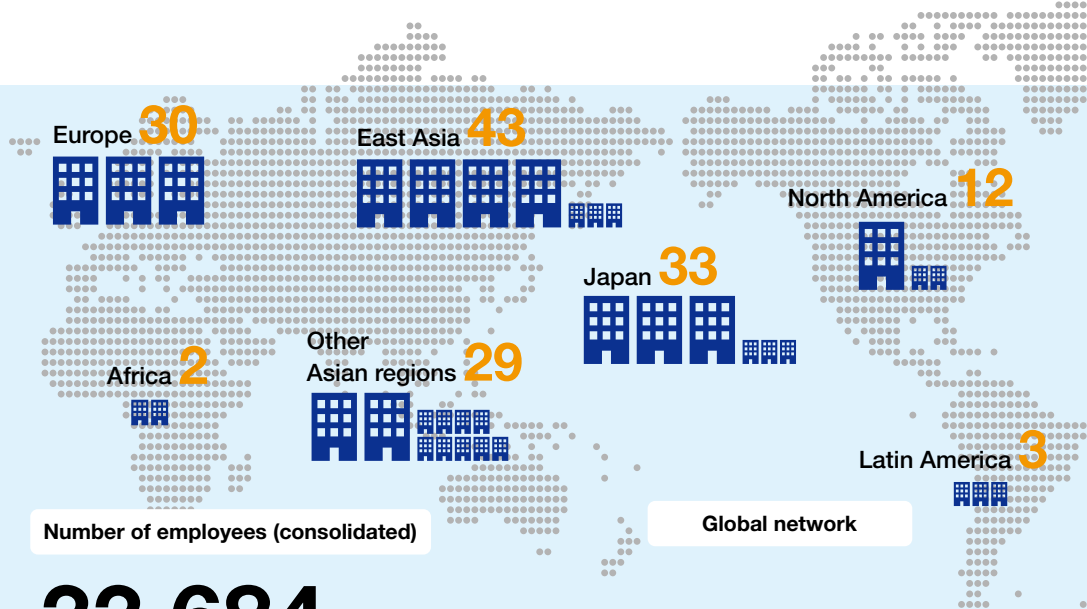
Workforce composition (consolidated)



Number of employees (consolidated)

33,684
311.5% YoY

Global network



Showa Denko Materials

Functional materials (electronics materials, printed wiring board materials, electronics components), advanced components/systems (mobility materials/components, electricity storage devices/systems, life science-related products)

Sales

¥302.7 billion

Operating income

-¥6.3 billion

Note: Includes a total of ¥28 billion for amortization of goodwill posted at the time of acquiring shares, etc., and inventory step-up.

Semiconductor materials

The world's No. 1, with a number of products commanding the largest market share



Molded plastic modules

The world's No. 2 market share for molded plastic automotive rear modules



Regenerative medicine

The world's No. 2 order volume



We are developing business in a broad range of areas, such as semiconductor and display materials, copper-clad laminates, photosensitive films, functional resins, adhesive films and automotive-related products.

Aluminum

Cylinders for laser beam printers, etc.

Sales

¥80.2 billion

Operating income

¥0.4 billion

Aluminum cylinders for laser beam printers

The world's No. 1 market share



Our aluminum cylinders for laser beam printers are processed using our proprietary non-cutting mirror-finish method.

Others

Marketing of chemicals, resins, metals, electronic materials, etc., and supply of building materials

Sales

¥107.3 billion

Operating income

¥1.2 billion

Value Creation Process

The Showa Denko Group is committed to satisfying all stakeholders and thereby contributing to society. In response to the requirements of customers and society for innovative materials technologies, we will integrate midstream and downstream technologies to offer required advanced materials functions in a timely manner. Thus, we will fulfill our role as a socially aware advanced materials partner to contribute to sustainable global development.

Mission

**We will satisfy
all stakeholders**

Social issues

Multi-polarity of
world economy

Demographic
change

Climate change

Resource
depletion

Respect for
human rights
throughout
value chain

Distribution of wealth /
social divide

Financial capital

Consolidated total assets

¥2,203.6 billion

[As of December 31, 2020]

Instrumental capital

Worldwide production bases

Intellectual capital

Intellectual properties, fundamental technologies and a wealth of expertise related to organic chemicals, inorganic chemicals and aluminum

Human capital

Diversity as a driving force for innovation and solution creation

Social capital

Collaboration with various stakeholders

Natural capital

Effective use of energy and resources; technologies that contribute to solving environmental issues

Purpose

Change society power of

**Contribute to the sustainable development
functions required of the times and**

Steadily provide the market with
aiming at the creation and development
“self-directed portfolio reform”

Stable Earnings business

Earn a stable profit and
generate investment capital for
the entire group

Next-Generation

Promote investment
viability in order to
next-generation

Fundamental Technology

Technology platform business to support

For more details, please refer to “Portfolio

Realization

Showa Denko's strength

Chemistry to Synthesize

Midstream materials technologies to promote
Fundamental Technologies/Materials business that
lead to various businesses

Fundamental technologies shared by the two

Corporate governance

Sustainability

ose

ty through the chemistry

ppment of global society by creating
s an advanced materials partner

with a wide range of functions,
ppment of new businesses through
" and sustainable high growth

tion business

ent while verifying
ler to develop
pillar businesses

Core Growth business

Invest massively in businesses with
huge growth potential

ies/Materials business

upport innovation of other businesses

olio management for sustainable growth" on page 29.

of functions

Showa Denko Materials' strength

Chemistry to Formulate

Function design technologies to promote
downstream application business

companies **Chemistry to Think**

Safety and compliance

management

Ideal state

Company with a
strong presence in
the global market

Company that
contributes to a
sustainable global
society

Financial capital

Long-term vision
Long-term numerical
targets for 2025

TSR

Aim to rank among the
chemical industry's top
25% over the medium
to long term

EBITDA margin

20%

ROE

15%

Net D/E ratio

Close to **1.0**

Nonfinancial capital

Solving social issues

Challenges to realize
carbon neutrality

Initiatives for an advanced
recycling-oriented
society

Contribution to QOL
improvement



For more details, please refer
to pages 32-37.

SUSTAINABLE
DEVELOPMENT **GOALS**

Reasons for Integration

Synergy for Newly Integrated Company

In order to continue to compete in the materials industry, where the market is changing rapidly and customer needs are becoming increasingly sophisticated, we need to generate innovations so as to be duly equipped to respond to a diverse range of customer requirements. We will integrate the two companies' technologies to organize collaborative domain structures and provide the right solutions to various needs of customers and society, demonstrating our commitment to becoming an "advanced materials partner for one-stop solutions."

Material design

Processing technologies

Design / evaluation / consultation

Advanced materials partner for one-stop solutions

Showa Denko's strength

Chemistry to Synthesize

Midstream materials technologies to promote Fundamental Technologies/Materials business that lead to various businesses

Showa Denko Materials' strength

Chemistry to Formulate

Function design technologies to promote downstream application business

Fundamental technologies shared by the two companies **Chemistry to Think**

Enterprise integration for technology integration

Integrate and enhance technologies under the three categories of "Chemistry to Synthesize," "Chemistry to Formulate" and "Chemistry to Think," to be able to provide an extensive range of functions to the market while creating/developing new businesses and increasing technical capabilities, thereby achieving sustainable growth.

Chemistry to Formulate

Function design technologies developed by Showa Denko Materials to promote downstream application business

Chemistry to Synthesize

Midstream materials technologies related to various businesses developed by Showa Denko

Chemistry to Think

Fundamental technologies shared by the two companies (computational science, structure analysis, evaluation/simulation technology)

Technology integration plan (example)

Heat management business for power module

Offer heat management materials package

Leverage our unique product lineup and analysis/module evaluation technologies to demonstrate functions resulting from combining materials to customers and solve technical challenges

Realization of functions

Chemistry to Formulate

Sintered materials

Encapsulants

Chemistry to Synthesize

Aluminum specialty components

Ceramics

SiC epitaxial wafers

Chemistry to Think

Analysis/module evaluation technology

Power Module Integration Center established in July 2021



Achieve Innovations

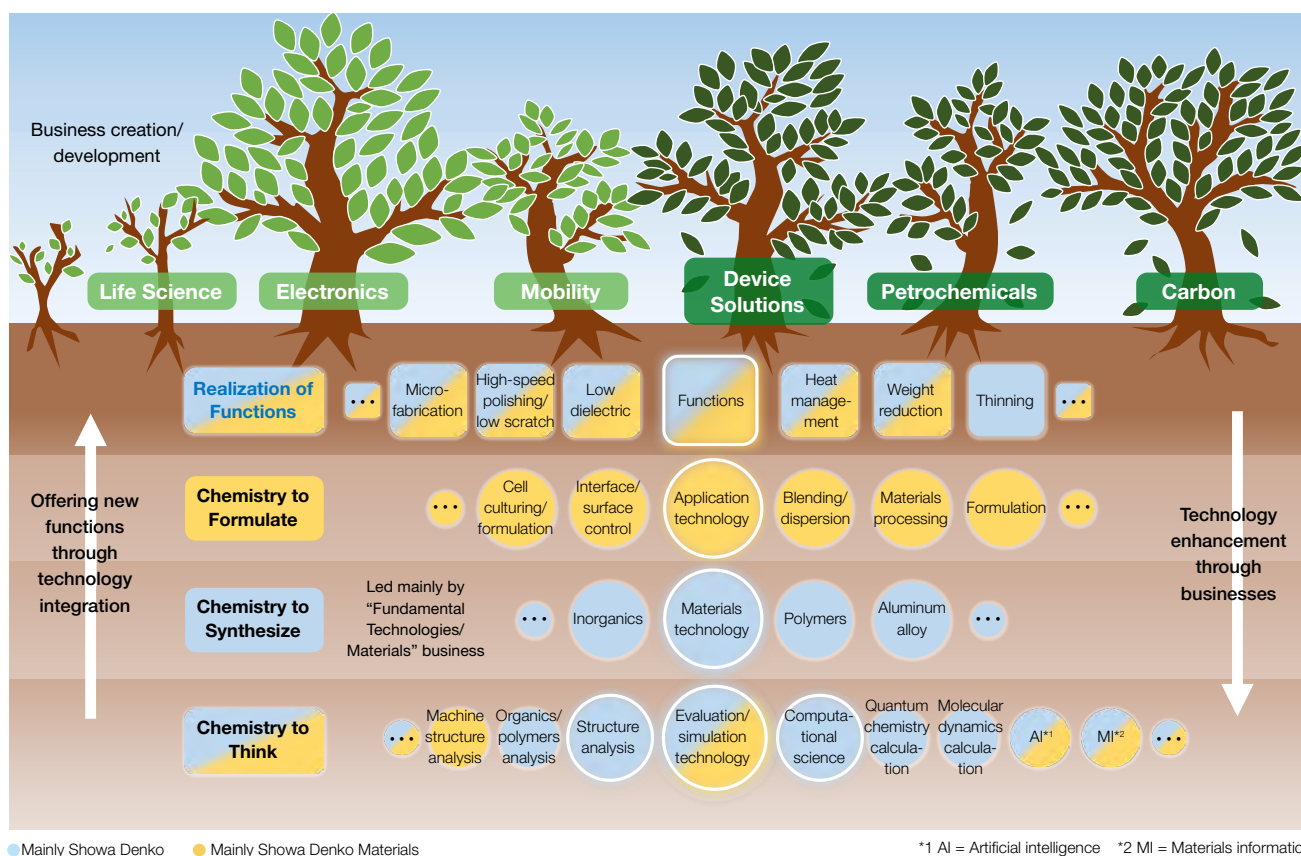
Customers

**OEM/Tier 1
technology partner**

- Digital
- 5G
- Next-generation mobility

Society

**Contribute to
a sustainable
society as a whole
by providing new
functions**

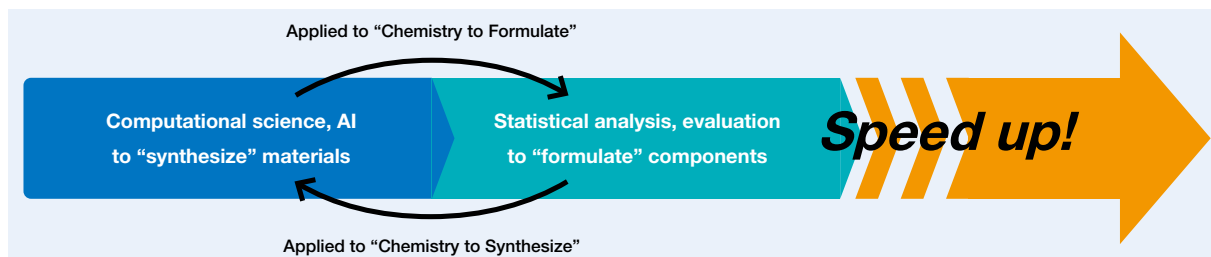


Reasons for Integration: Synergy for Newly Integrated Company

CTO Message

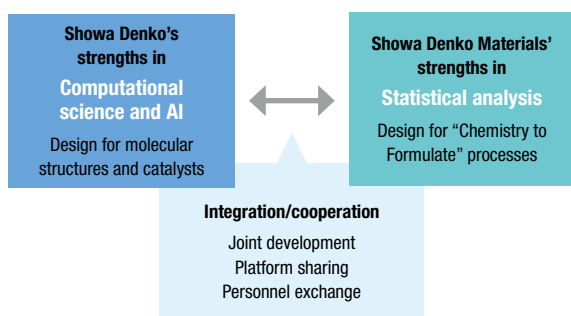
“Chemistry to Think” to create synergy

Promote the sharing of fundamental R&D capabilities in order to shorten development cycle:
 Allow Showa Denko's computational science and AI technologies to be applied to “Formulate” processes and Showa Denko Materials' statistical analysis and evaluation technologies to “Synthesize” processes



Chemistry to Think

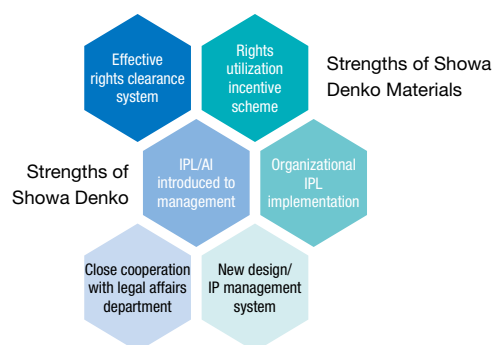
Computational science, structure analysis and evaluation/simulation technology fall into the category of “Chemistry to Think,” which represents fundamental technical capabilities to be shared by Showa Denko and Showa Denko Materials. It will become easier for the two companies to share their respective strengths in this category by, for example, allowing Showa Denko's strength in computational science and structure analysis and Showa Denko Materials' in statistical analysis and evaluation technology to be applied to processes performed by the other as needed. This is intended to increase the quality and speed of R&D activities.



Technical personnel exchange and data scientists development

To implement DX strategies for 2021, we are carrying out integration and implementation plans for Showa Denko's AI technology and Showa Denko Materials' statistical analysis technology, which have begun to produce results, such as shorter materials development periods and better catalyst performance. As a measure to introduce these achievements across the Group, we have launched internal programs to develop and certify data scientist skills, looking to encourage materials engineers to undertake technical data processing tasks.

Also, the two companies are planning to integrate their IP-related functions. Specifically, big data-based IP landscape programs and various AI-enabled tools will be adopted to improve research efficiency and reduce the risk of infringement on other companies' rights in an effort to sharpen our competitive edge.



Hiroshi Sakai

Director & Corporate Officer
 Chief Technology Officer (CTO)
 Showa Denko

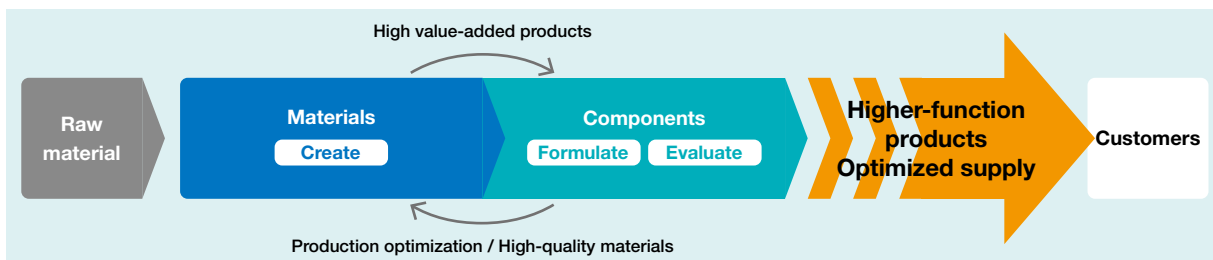
Outlook for the future

I am looking forward to seeing new types of innovation emerging from the interactions among a diverse array of technologies and personnel from the two companies that are to be brought together. R&D personnel also have high expectations for the integration, as I perceive from their lively discussions on this topic.

We will work to produce synergetic effects as early as possible to be able to offer technologies, products and services that will surpass customers' expectations and imagination.

“Chemistry to Synthesize” and “Chemistry to Formulate” collaborate for further advancement

Boost long-established strengths of the two companies to generate synergetic effects
Effectively combine Showa Denko's materials technologies and Showa Denko Materials' application technologies



Combine “Chemistry to Synthesize” and “Chemistry to Formulate” to produce synergetic effects on business

“Chemistry to Synthesize” and “Chemistry to Formulate” refer to Showa Denko's midstream materials technologies and Showa Denko Materials' downstream application technologies, respectively.

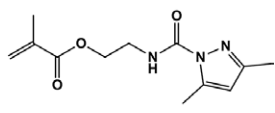
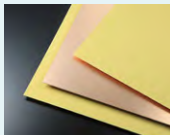
CMP slurry

Chemical mechanical polishing (CMP) is a highly technical production process, and is positioned as a strategic technology to fully bring out the synergetic effects from the integration of “Chemistry to Synthesize” and “Chemistry to Formulate.” One relevant plan is to enhance the performance of CMP slurry produced by Showa Denko Materials for semiconductor device processing by leveraging technologies for ceramics, microparticulation and high-purity polymers from Showa Denko's “Chemistry to Synthesize” in order to support those for interface control, nanoparticles and water dispersion, basic technologies employed from “Chemistry to Formulate” to produce CMP slurry. Additionally, we plan to share facilities of the two companies to increase the technical capabilities and production capacity of the entire Group.

Showa Denko Ceramics/additives technology  Additive for electronics	Showa Denko Materials Interface control technology  CMP slurry

Copper-clad laminates

Another major plan is to add high-performance properties to copper-clad laminates produced by Showa Denko Materials by utilizing organic molecules design and polymer-related technologies from Showa Denko's “Chemistry to Synthesize” to enhance the value of substrate resin processed by capabilities from “Chemistry to Formulate.”

Showa Denko Organics/polymers design technology  Karenz™ (example)	Showa Denko Materials Electronic components design technology  Copper-clad laminates

Outlook for the future

In the “Fundamental Technologies/Materials” business, a leading driver of “Chemistry to Synthesize,” the newly integrated company will use inorganics, organics, aluminum and many other materials and technologies possessed by the two companies in order to offer solutions to markets and customers, while working with R&D divisions to provide strong technical platforms that will support innovations for the other three business categories of Core Growth, Next-Generation and Stable Earnings to ensure effective integration synergy. Going forward, we will consolidate materials-related businesses into functional materials business to undertake the above tasks appropriately.

Mitsuo Katayose

Director & Corporate Officer
Chief Technology Officer (CTO)
Showa Denko Materials



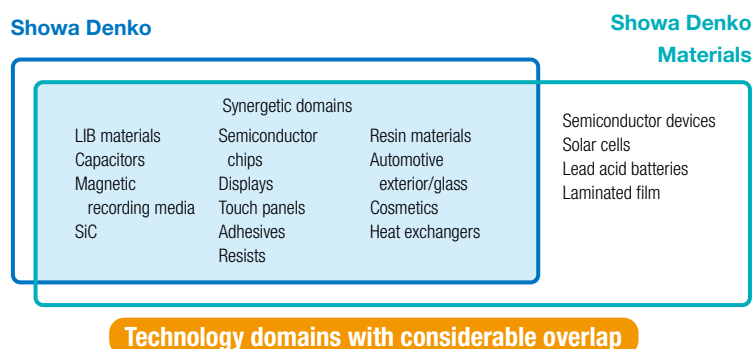
TOPICS: IP landscape shows synergy for integrated Showa Denko and Showa Denko Materials

To identify technology domains where the newly integrated company can take full advantage of the synergy to be created, we have performed IP landscape analyses. IP landscape analysis is a method to comprehensively clarify the situation of intellectual property rights held by the company and its competitors as well as related market conditions. We will use the results to develop management strategies.

The analyses were conducted for the two companies. Specifically, this means performing overview mapping to clarify technology domains, comparative mapping based on F-term patent classification, and landscape mapping to lay out product groups. The results have revealed a substantial overlap in technology domains while much less in product groups. This finding supports the integration plan aimed at enhanced technical knowledge and vertical integration for product development, particularly for the purpose of IP strategy, which is expected to become a strong driver of synergy creation.

Technology domain analysis

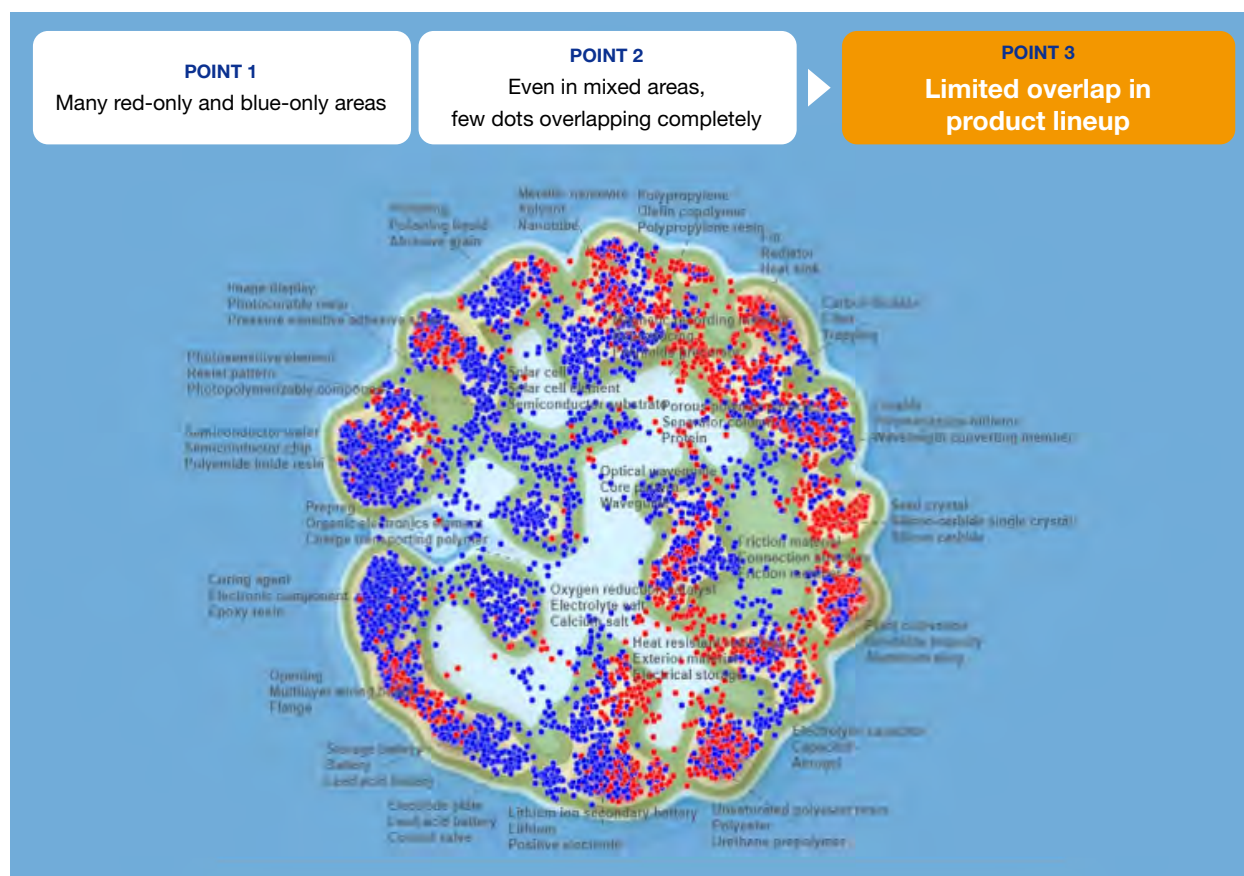
The overview mapping has identified technology domains where the newly integrated company can take full advantage of the synergy produced. Comparative analysis of patent portfolios of the two companies and competitors has indicated a larger overlap in technology domains between the two companies than between either company and any other company (for the purpose of calculation), giving support to the integration plan for effective technology collaboration in a range of areas related to materials and application.



Product group analysis

Results of product group analyses indicate overlap between the two companies in product groups being limited as compared with technology domains, which have considerable overlap. This suggests substantial potential for a broader product lineup ranging from midstream to downstream, a key to strong solution business development. The results also show product groups favorably distributed on the value chain, indicating a possibility of expanding the applicability of consolidated common technologies to product development.

Patents held by Showa Denko (red) and Showa Denko Materials (blue) from 2013



Created using Orbit Intelligence provided by Questel SAS

Long-Term Strategy to Realize the Vision

- 24 Top Message
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- 32 Feature Story 1 Challenges to Realize Carbon Neutrality
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- 45 Organizational Integration

Kohei Morikawa

President and CEO
Showa Denko K.K.

Top Message

We will pursue more ways to help solve social issues,
thereby contributing to a sustainable society while
achieving growth as the Showa Denko Group.

KOSEIHA Businesses specifically mean those that meet the following three conditions: operating margin ratio of 10% or more; operating income of billions of yen or more; and stable profitability tolerant of environmental change. “The TOP 2021” states that the number of **KOSEIHA Businesses** will be increased to at least half of all businesses by 2025.



For details, please see
“**Long-term vision and synergy for the newly integrated company**”
on pages 28 to 31.



For details, please see
“**Portfolio management for sustainable growth**” on page 29.

Important year for the company to show its true value

In 2020, largely due to the market impacts of COVID-19, we faced a substantial decrease in shipment volumes for a range of our products. In particular, the outbreak of the disease led to a substantial decrease in our shipment of graphite electrodes, aggravating a situation in which our customers had already been forced to adjust their inventories following a drop in the global production of crude steel that dated back to the latter half of 2019. As a result, we suffered a sharp drop in profits from graphite electrodes. However, demand expanded for electronic devices due to the spread of teleworking, enabling us to achieve steady growth in the electronics field despite the coronavirus crisis.

In 2021, against the backdrop of the recovery of automobile production, which started in the latter half of 2020, as well as the recovery of demand for steel products, we will be able to improve our performance markedly across all business fields. In 2021, we will thus work to recover our business performance, which dropped in 2020, as early as possible. Also, this year, we will be evaluated for what we have implemented under the medium-term business plan, “The TOP 2021,” which we launched in 2019 to make Showa Denko an aggregate of **KOSEIHA Businesses**.

When we formulated “The TOP 2021,” we had not yet planned to integrate Showa Denko Materials. However, even with that decision, the heading that we aimed for in the plan has not changed. Rather, the integration makes it possible for us to set far more ambitious targets and to build a system to achieve growth with greater speed. Accordingly, we need to adopt a new battle plan for the market.

Advancement of our business portfolio management

Toward full integration, we announced the **long-term vision** for the newly integrated company in December 2020, in which we set the purpose of the new company as: to “Change society through the power of chemistry.” We also defined the ideal state of the company as follows: a “Company that can win the global competition” and a “Company that contributes to a sustainable global society.” We will pursue this ideal state by conducting operations in a responsible and competitive manner in each of the “Core Growth,” “Next-Generation,” “Stable Earnings” and “Fundamental Technologies/Materials” businesses.

Four business categories

“Core Growth”

business that has tremendous growth potential

“Next-Generation”

business expected to develop into a next-generation pillar

“Stable Earnings”

business that serves as a revenue base through stable profit-making and the generation of investment capital for the entire company

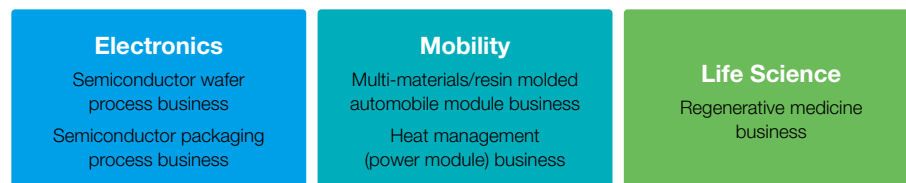
“Fundamental Technologies/Materials”

business that provides the technology platform to support innovations

For “Core Growth” business, we set the target of an annual sales growth rate of 10% or more and for “Next-Generation” business, we set the target of achieving business growth as planned in the roadmap. Depending upon the target achievement level, we will change the investment priority given to a specific business. For a business that can no longer be included in any of the four categories, the investment priority will be lowered. As a result, the business will not be able to receive sufficient investment, which will in turn decrease its competitiveness. In such a case, I think it would be better for the business division to be taken out of the Group and placed in a management environment in which it can receive more investment. We will therefore let the division leave the Group to find a good fit for itself elsewhere, rather than just selling it. But unless we can devise a scenario wherein the division will be able to achieve growth by receiving more investment in a new environment outside the Group, we will not let it leave the Group and will instead just withdraw from the business.

Top Message

Among the businesses belonging to the “Core Growth” and “Next-Generation” categories, we regard the following five as “growth businesses” that will lead the growth of the entire Showa Denko Group on a medium- to long-term basis.



For the sustainable expansion of these growth businesses, we need to enhance technologies for materials. In this regard Showa Denko already has highly competitive technologies, including those to design and analyze materials. By integrating Showa Denko Materials, which has advanced functional design technologies, it will become possible for us to create the materials that will help ensure our business growth and then make even more effective use of those materials through advanced functional design for the further growth of the businesses. The integration has thus provided us with the “soil” in which we can grow our growth businesses faster than the market growth rate, rather than simply adding large growth businesses to the business scope of the Showa Denko Group.

Total sales in the five growth businesses reached about ¥230 billion for 2020, and we aim to expand these sales to the ¥600 billion level by 2030. Also, through innovations made in the businesses, including synergy effects generated by the integration, we will increase operating income by ¥18 billion for 2025 and by ¥48 billion for 2030.

Achieve further growth by promoting fundamental businesses

Fundamental businesses represent another important business category for us. In these businesses we will fuse the technologies of the two companies to enhance the comprehensive strength of the Showa Denko Group. Unlike the “Stable Earnings,” “Core Growth” and “Next-Generation” businesses, for which our target markets are clearly defined, we can target and exert influence over a wider range of markets in the fundamental businesses, such as the ceramics, functional chemicals (resin and others) and aluminum specialty components businesses. For example, our highly functional polymers are used not only as semiconductor and LCD materials but also as building materials.

By the integration, Showa Denko Materials’ businesses conducted in the downstream section of the industry have been added to the Showa Denko Group, which has resulted in an increase in opportunities for business expansion in the fundamental businesses. With the two companies inspiring each other, their development ability will be further enhanced in the downstream products section and also in the midstream materials section. Moreover, when we face a challenge in the manufacturing process of a certain material, we can now seek cooperation from within the Group rather than outside it, which enables us to innovate faster. Also, within the Group we can disclose everything and share know-how and technologies for both materials and applications. I expect that such achievements will be made in the fundamental businesses.

Pursue more ways to help solve social issues

Toward full integration between Showa Denko and Showa Denko Materials, we have reconfirmed our purpose as “Change society through the power of chemistry,” thereby enhancing the linkage between the growth of the Showa Denko Group and contribution to the solution of social challenges, as represented by the SDGs. SDGs- and ESG-oriented measures have a tremendous impact on the value of companies and contributing to a sustainable society will enable us to achieve sustainable corporate growth.

In our efforts to solve climate change-related issues, we are committed to becoming carbon neutral by 2050, for which we set the target of reducing our greenhouse gas emissions by 30% relative to the 2013 level by 2030. Based on the recognition that we consume energy to produce basic materials such as petrochemicals, we will implement measures for higher production



For details, please see
“Feature Story 1: Challenges to Realize Carbon Neutrality”
 on page 32.



For details, please see
“Dialogue between the Presidents”
on pages 2 to 6.



For details, please see
“Feature Story 2: Tackling SDGs
through Business Activities/
Initiatives for an advanced
recycling-oriented society:
Graphite electrode-driven steel
recycling” on page 36.

efficiency and fuel conversion, thereby saving more energy and costs toward the achievement of our greenhouse gas emissions reduction target.

Also, we need to pursue more ways to create a sustainable society through the power of chemistry. The products made by the Showa Denko Group have already made contributions to society and to meeting social challenges including the SDGs. However, that is not enough. We need to pursue more ways to help solve social problems. To meet this requirement, it is important to add more SDGs- and ESG-oriented functions to our existing products, which will help the Group achieve further growth and differentiate itself from competitors.

As I mentioned in the dialogue with President Maruyama, we are promoting plastic chemical recycling to produce ammonia from used plastics. Ammonia is used as a denitrification agent at thermal power plants and also as a fiber material and is indeed a useful material. Our recycling technology to generate ammonia from used plastics is further increasing the value of the produced ammonia.

In the graphite electrode business, we deliver customized electrodes to customers according to the characteristics of their electric furnaces, thereby helping them promote iron recycling. In order to contribute more to customers through the delivery of electrodes, the Showa Denko Group acquired AMI Automation (“AMI”) headquartered in Mexico in February 2021. AMI provides an operation optimization service for electric furnaces, and by linking this service with our own solution services, we will become able to provide customers with higher-performance electrodes and help them increase the operational efficiency of their electric furnaces, conserve more energy and reduce their greenhouse gas emissions. This will in turn help the Showa Denko Group make more contributions to society.

In this way we will foster the creation of extra value across all our businesses.

Showing recovery from the fiscal 2020 performance

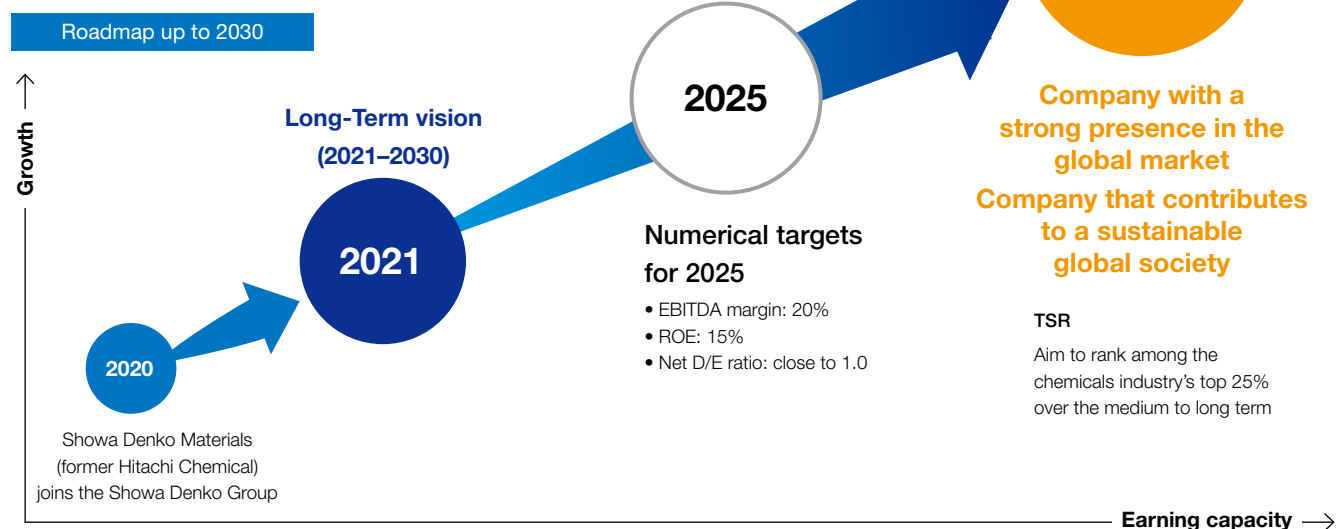
To stop the spread of COVID-19, we give first priority to ensuring the safety and protecting the health of our customers, business partners, employees and other stakeholders and have implemented a range of infection prevention measures. Employees of the Showa Denko Group and its partner companies are continuously working to supply products that are essential to everyday life while also protecting their own safety and health, which is something I am very proud of.

In April 2020, we made Showa Denko Materials a wholly owned subsidiary of Showa Denko and in December of the same year announced the long-term vision for the newly integrated company. We are now making steady progress toward the full integration of the two companies as a corporate entity in 2023.

In 2021, we will continue to make efforts to show you how we are making a strong recovery from the serious blow to our fiscal 2020 performance caused by COVID-19 and other factors.

President and CEO

Long-Term Vision (2021–2030) for Newly Integrated Company

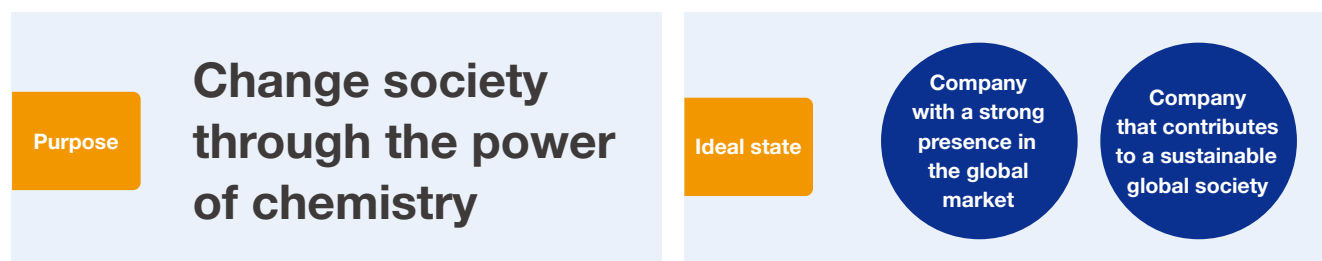


In December 2020, Showa Denko announced the long-term vision (2021–2030) for newly integrated company. This is a result of reviews started in April 2020, when Showa Denko Materials (former Hitachi Chemical) joined the Showa Denko Group, and continued in order to integrate the two companies and establish a foundation for future growth. As an integrated company, we are committed to providing new functions and values to the chemicals industry, where intensifying global competition and accelerating changes in market structure will likely continue, thereby contributing to the development of a sustainable society.

Long-term vision and synergy for the newly integrated company

Purpose and ideal state

The purpose of the newly integrated company is to “Change society through the power of chemistry,” as stated publicly by the Showa Denko Group. This includes contributing to the development of a sustainable global society by creating functions required of the times as an advanced materials partner. Also, the new company will aim to become a company that has a “strong presence in the global market” and “contributes to a sustainable global society,” two components of the Ideal state to be achieved in order to fulfill the Purpose.



Objective of integration

Currently, global demand for solutions to environmental and social issues and contributions to SDGs is driving the need for the renewal of various social infrastructure, such as digital infrastructure as well as mobility and energy infrastructure. In this context, expectations for innovation by materials manufacturers are growing.

By integrating the two companies, we will meet these societal demands and expectations of our customers head on. We will provide one-stop solutions and new functions to our customers and contribute to a sustainable society as a whole as a “global top-level functional chemical manufacturer” that will realize a breakthrough by fusing Showa Denko’s midstream materials technologies, Showa Denko Materials’ downstream application technologies and both companies’ evaluation and analysis technologies.

Portfolio management for sustainable growth

To realize the Ideal state, we will leverage the highly complementary business portfolio built through the integration of the two entities, which consists of four categories: Core Growth business, Next-Generation business, Stable Earnings business and Fundamental Technologies/Materials business. By bringing the four business domains fully into play, with each capitalizing on a competitive advantage commensurate with their respective roles, we will continue to provide new functions to the market and realize continuous growth.

In particular, by deploying a wide range of technologies and materials from the Fundamental Technologies/Materials business domain to strengthen the competitiveness of each of the business categories while continuing to refine such technologies and materials across a variety of businesses, we will seek to expand our presence in new and promising future markets. Also, we will look at M&A and other opportunities for acquisitions in new areas of Next-Generation business, and split off businesses unfit for any of the four categories as appropriate, as part of efforts to achieve high growth.

Business acquisitions in new areas through M&A etc.

● Showa Denko ● Showa Denko Materials

Stable Earnings business

Earns a stable profit and generates investment capital, maintaining competitiveness/high share in markets where competitive landscape is stabilizing

Device Solutions



Hard disk media
The world's No. 1 independent manufacturer/seller with cutting-edge technology

Carbon



Graphite electrodes
The world's No. 1 production capacity/market share due to high quality and cost competitiveness

Industrial Gases



Petrochemicals



Strong presence in East Asia
Derivatives with high market share

Basic Chemicals



Coating Materials



Electronics Materials



Next-Generation business

Favorably positioned to aim for future growth in promising markets and will be developed into a next-generation pillar

Life Science



Regenerative medicine
The world's No. 2 order volume

Core Growth business

Offers products with overwhelming presence/top share in growing markets, and will sustain the Group's future growth

Electronics



Semiconductor-related materials
The world's No. 1 with a number of products commanding the largest market share

Mobility



Resin-molded automotive modules
The world's No. 2 for resin-molded rear door modules

Fundamental Technologies/Materials business

Handles a wide range of inorganics, organics and aluminum technologies and materials and serves as a technology platform to support innovation and enhance the competitiveness of the three other business categories

Ceramics



Functional Chemicals (resins, etc.)



Aluminum Specialty Components



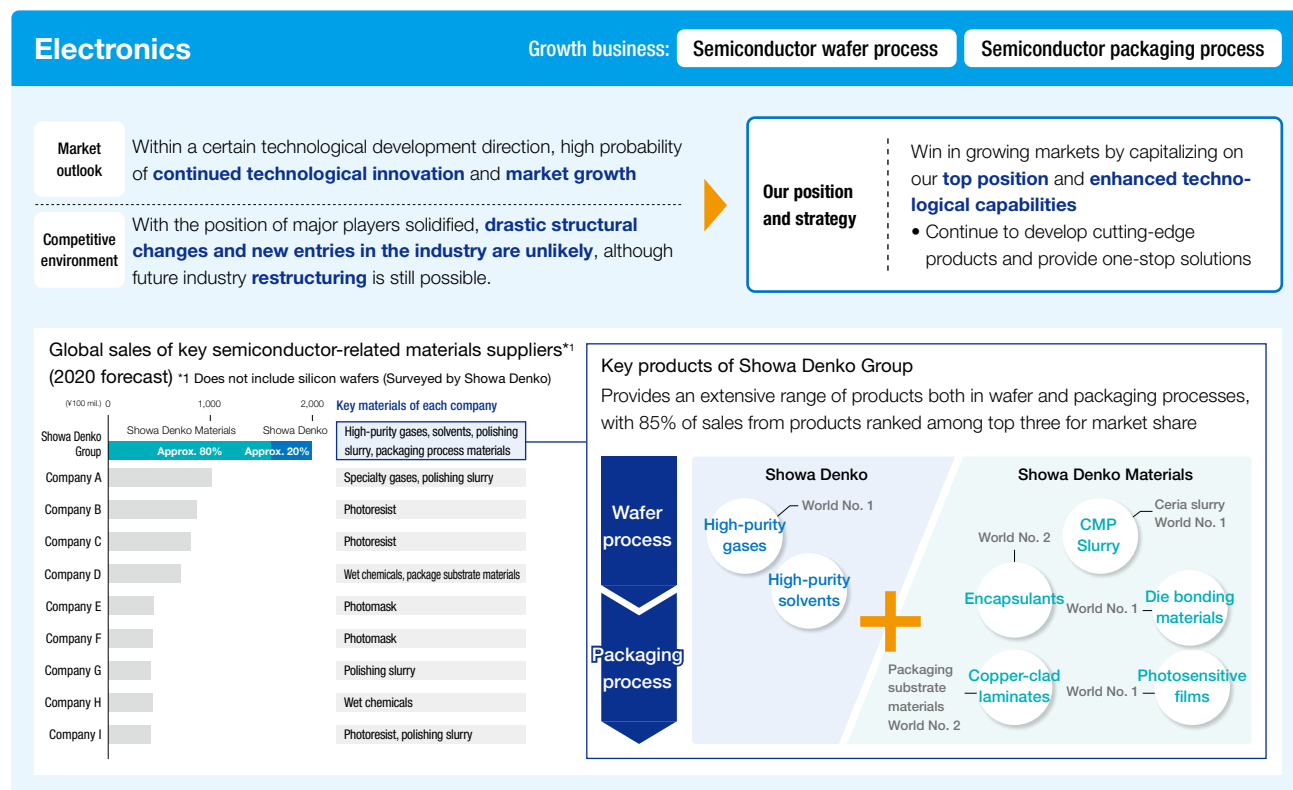
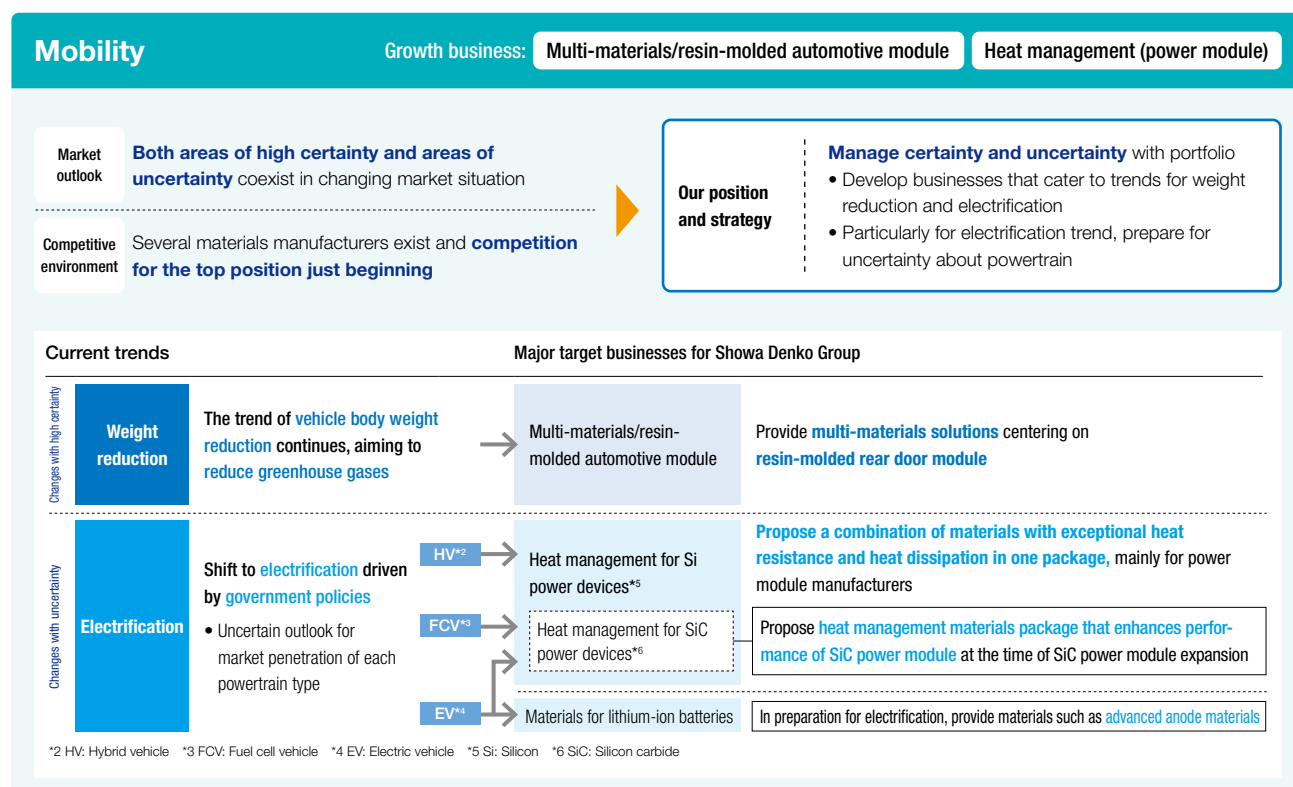
Shares and order volume are based on surveys by Showa Denko.

Split off businesses that do not/no longer fit into any of the four business categories

Long-Term Vision (2021–2030) for Newly Integrated Company

Market assessment and strategy for Core Growth and Next-Generation businesses

The Core Growth and Next-Generation businesses will drive the Showa Denko Group's future growth. We will pursue business development with a good understanding of differences in market stages and our position in each business. (Note: Figures for estimate, shares and order volume are based on surveys by Showa Denko.)



Market outlook

Despite **certainty** about market expansion, wide **disparity of market views** on expansion timelines and growing segments

Competitive environment

Currently led by first movers including us, and will likely see entry by new players in the near future

Our position and strategy

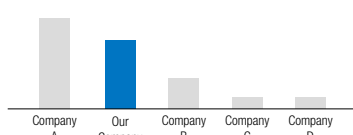
Drive growth by leveraging first-mover advantages

- Quickly recoup investment by leveraging current competitive advantages
- Grasp changes and identify segments where competitive advantage can be established

Global top-class contractor and know-how

Global top-class range of cell types including for autologous, allogeneic, clinical and commercial use

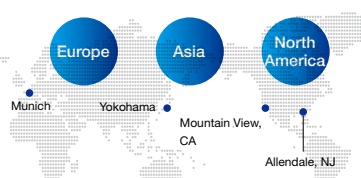
Cumulative order volume (2019/no. of items)



Lead the market with accumulated know-how on use of diverse element technologies as a source of differentiation and competitive advantage over the medium to long term

Global production structure

Global service structure established, with bases in North America, Europe and Asia



Recoup investment quickly by using the three global locations to full advantage to win orders

Development of pioneering manufacturing technology

Pursuing development and introduction of automation/ large-scale suspension culture technology ahead of competitors

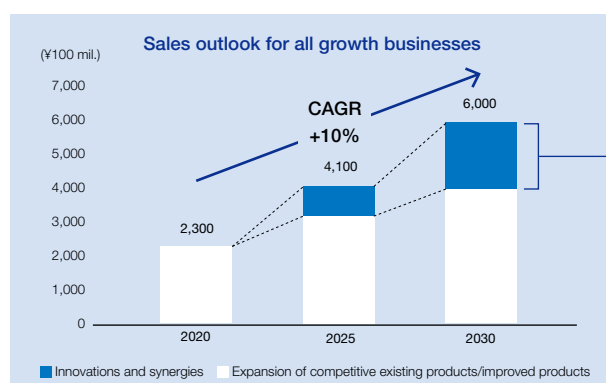
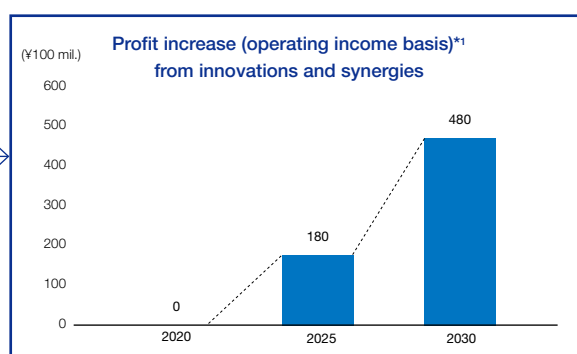


Get a start on expected future cost innovations ahead of competitors to gain a sustainable competitive edge

Projected innovation impact

Expand growth businesses to around **¥600 billion** by 2030 through technological innovations and synergies resulting from integration of the two companies

Projected sales and operating income in growth businesses (estimated)



*1 Does not include operating income based on sales of non-innovations and non-synergies

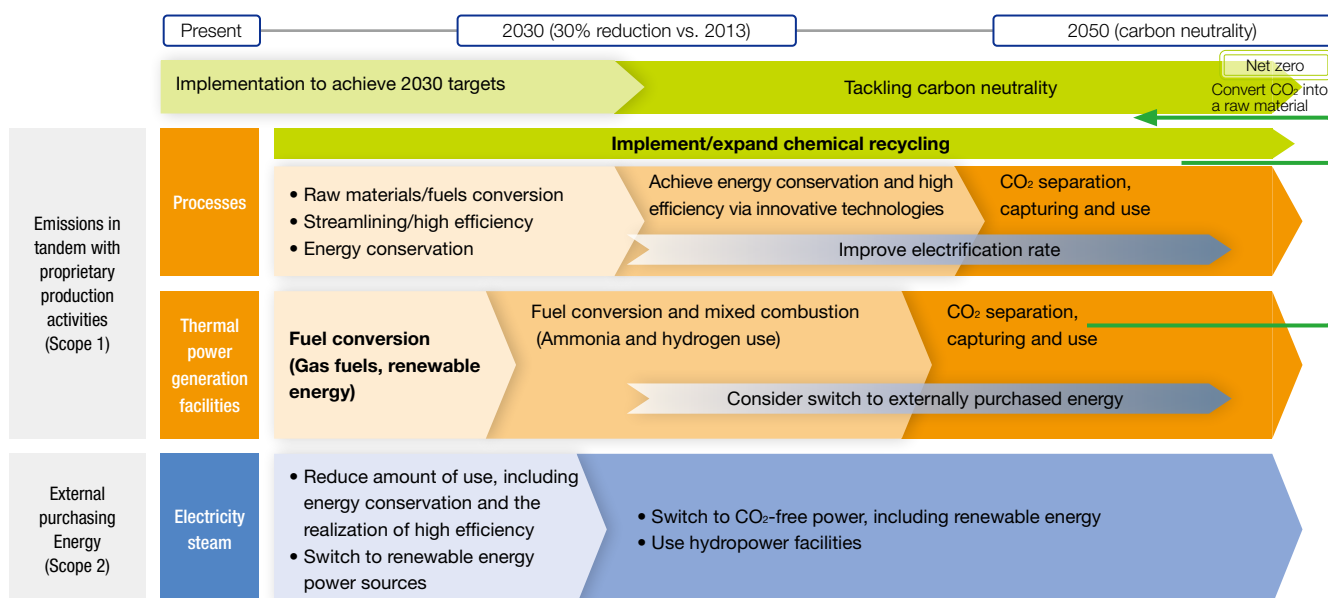
Cumulative sales for the above five growth businesses totaled approximately ¥230 billion in 2020, and we will seek to scale up these businesses to reach ¥600 billion by 2030, while achieving CAGR of 10%, through innovations and integration-related technological synergies. Also, we will aim to generate an additional ¥18 billion and ¥48 billion in operating income genuinely related to innovations and synergies in 2025 and 2030, respectively.

Feature Story 1

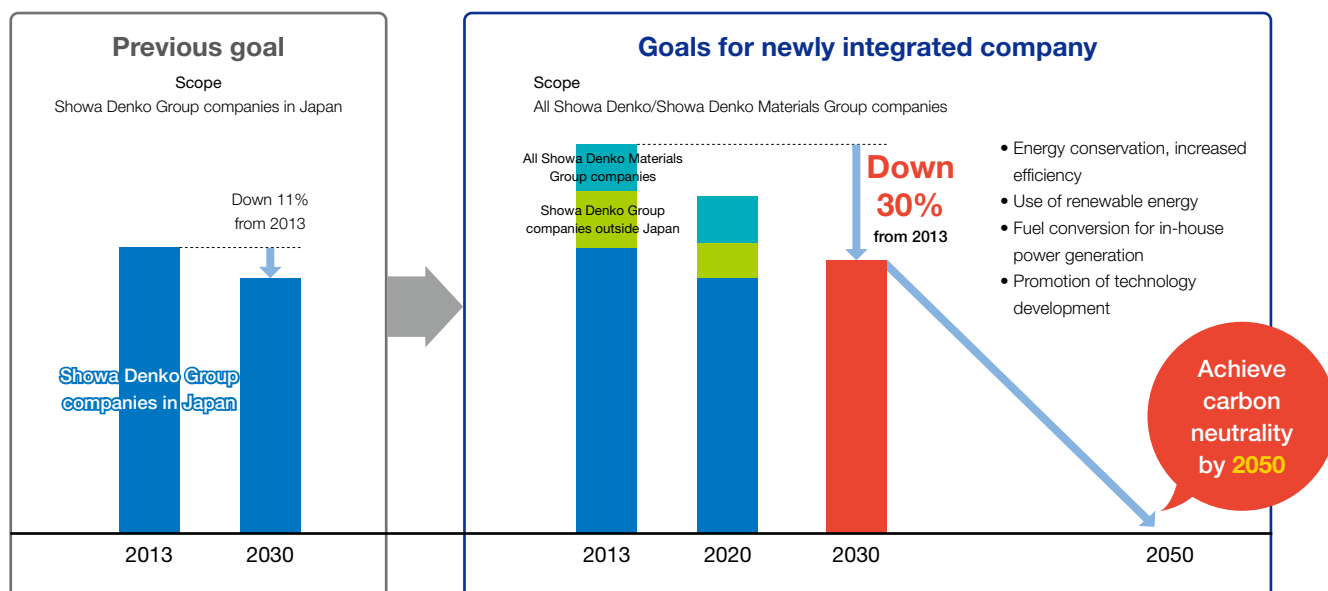
Challenges to Realize Carbon Neutrality

Climate change phenomena are occurring frequently and on a global scale. According to the science, greenhouse gases are considered to be a major factor for such phenomena. Under the Paris Agreement, a leading international initiative to tackle this issue, a goal was set to keep the rise in mean global temperature to less than two degrees Celsius above pre-industrial levels (“two degree target”), and efforts to address this challenge are expected to be accelerated over the coming years. In order to support such efforts, the Showa Denko Group will take up new challenges aimed at carbon neutrality, setting goals for 2050. This is one of our key approaches to becoming a “company that contributes to a sustainable global society,” the ideal state defined in our Long-Term Vision.

Roadmap to carbon neutrality in 2050



- Up to 2030, promote initiatives for rigorous streamlining, increased efficiency, energy conservation, conversion to gas fuels (high-efficiency co-generation system)
- Promote technology development for new GHG capture and utilization processes and sustainable plastic chemical recycling
- From 2030 to 2050, promote in earnest initiatives for fuel conversion/mixed-combustion using ammonia and hydrogen, and electrification of production processes
- Promote utilization of private hydroelectric power and shift to renewable energy power for use in production
- Aiming to achieve carbon neutrality, promote the development of innovative GHG capture/utilization technologies, utilization of recycled GHG as chemical materials, and implementation of sustainable plastic chemical recycling technologies



Initiatives for carbon neutrality

High-efficiency co-generation system

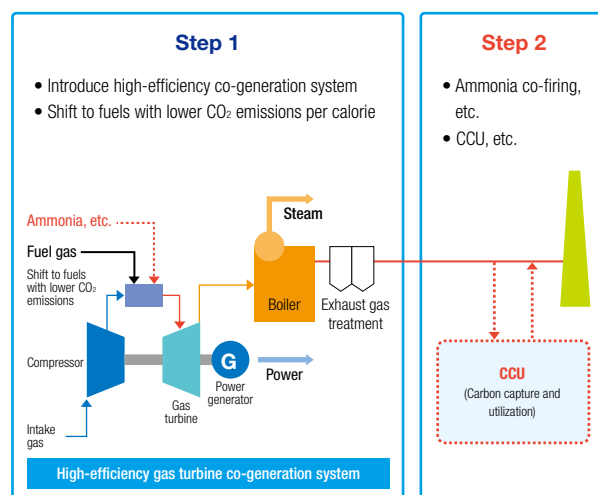
Promotion/expansion of chemical recycling

High-efficiency co-generation system

The Showa Denko Group has installed in-house thermal power generation systems with the boiler and the steam turbine designed so as to ensure the efficient supply of electricity and heat (steam) energy sourced from fossil fuels. This is to allow the energy to be used effectively for each of the different production processes, such as heating and distillation, at chemical plants. Also, this off-grid power supply function represents an essential BCP item at chemical plants in preparation for the contingency of a power outage.

We will upgrade the above in-house thermal power generation systems so as to serve our carbon neutrality initiatives. The plan consists of two steps. In the first step, we will introduce a state-of-the-art high-efficiency gas turbine co-generation system, among others, to improve overall energy efficiency, and then switch to fuels with lower CO₂ emissions per calorie in an effort to promote lower-emission operations. These measures involve conversion from solid to liquid fuels, which will effect a significant reduction of CO₂ emissions, thereby contributing to environmental conservation.

The second step is the planned adoption of co-firing systems based on carbon-free ammonia and other fuels as well as of carbon capture utilization (CCU) and other carbon recycling processes, aiming for carbon neutrality.

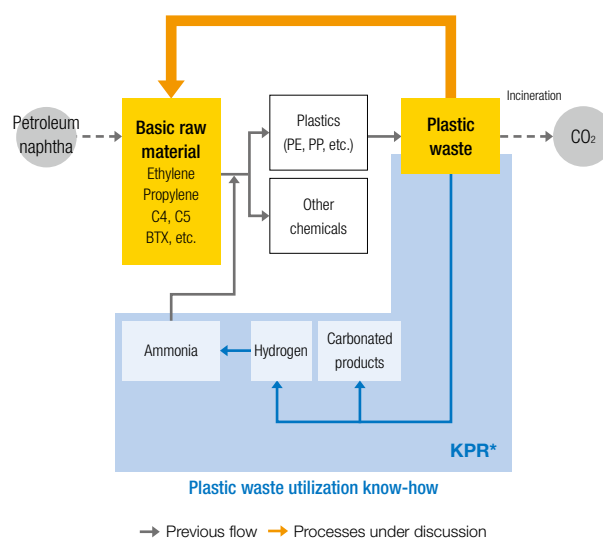


Promotion/expansion of chemical recycling

In order to facilitate carbon neutrality in the chemicals industry, it is imperative, along with increasing energy use efficiency, to reduce the use of fossil resources, a leading raw material for many chemical products, as exemplified by plastics. In Japan, a reported 70% of used plastics are incinerated, resulting in CO₂ emissions, including for the purpose of heat recovery. Among a number of proposed solutions to this issue, chemical recycling—referring to the reuse of plastic waste as a raw material for chemical products—is drawing broad attention.

The Showa Denko Group is already engaged in plastic chemical recycling for ammonia and hydrogen manufacturing. Based on the practical knowledge on plastic waste utilization that has been cultivated through past operations, we are ramping up R&D activities to expand the application of chemical recycling capabilities. Specific plans are discussed for adopting recycled plastics to manufacture ethylene, propylene and other substances used as raw materials for plastics and many other types of organic chemical products in place of petroleum naphtha, a primary conventional option.

We are striving to raise the chemical recycling rate to the extent possible, overcoming limitations related to dirt and impurities, with the aim of achieving fossil-free chemicals production, which represents a significant stride toward a carbon neutral society. We will accelerate our efforts to introduce the results of the above activities to the market as early as possible to broaden the range of applicable products that support a recycling-oriented, carbon neutral society, thus fulfilling our social responsibility as a chemicals manufacturer.



* KPR: Kawasaki Plastic Recycle, plastic recycling business operated at the Kawasaki Plant



For more details, please refer to “Initiatives for an advanced recycling-oriented society: Plastic chemical recycling” on page 35.

**Feature
Story
2**

Tackling SDGs through Business Activities

The Showa Denko Group is committed to contributing to solving social issues, with a focus on the SDGs, through its business activities. To demonstrate this commitment, we will first assess the current level and characteristics of the contribution of our individual products and services to achieving the SDGs, and then map out specific plans to enhance our future contribution.

As part of assessment programs, we have selected products/services to focus on to enhance our contribution toward achieving the SDGs (“SDGs Contribution Products/Services”), based on our voluntary criteria.

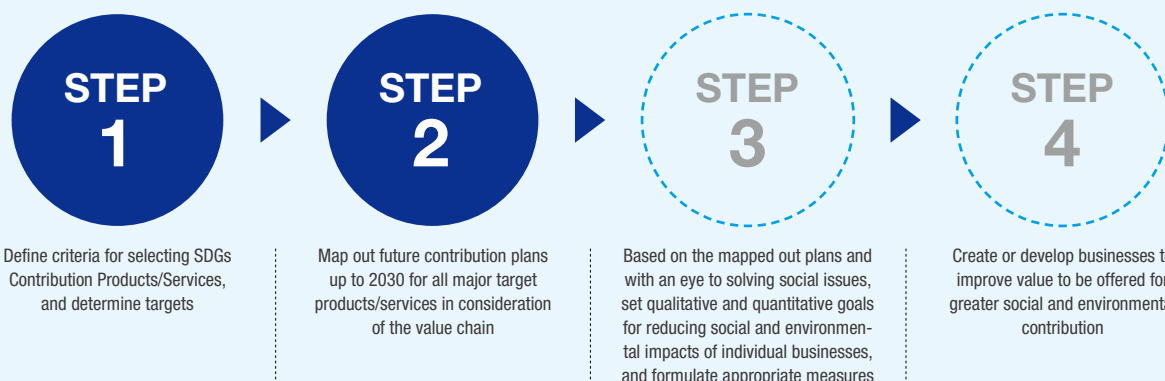
Selection criteria and processes for SDGs Contribution Products/Services

We started by charting the situation of products/services on two axes—one for the link between the goals or targets of the products/services and the SDGs, and the other for the social sphere of influence—and defined a region for SDGs Contribution Products/Services.

The products/services identified in the above process were then discussed separately at the two companies. At Showa Denko, the identified products/services were subject to screening to make a list of candidates at the SDGs Promotion Working Group consisting of representatives from the head office’s staff divisions. The list was reviewed by the Sustainability Promotion Council composed of staff division heads from the head office before being approved by the Management Committee.

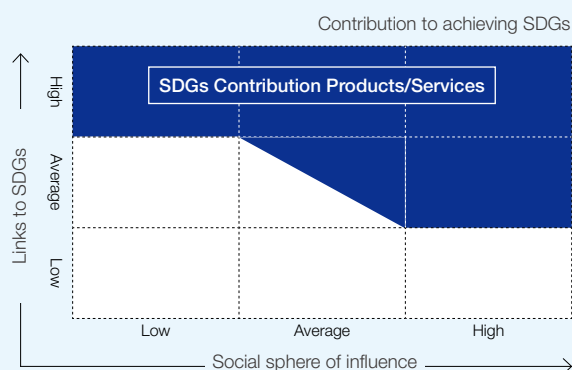
At Showa Denko Materials, a list of candidates was created based on past results from efforts to address the SDGs as an issue of materiality, and the list was reviewed by the Sustainability Promotion Council before being approved by the Management Committee, according to similar procedures to those of Showa Denko.

Showa Denko Group's 4 steps to tackle SDGs through business activities



STEP 1

A chart was created setting criteria and defining a region for SDGs Contribution Products/Services (see below). The same criteria were adopted by Showa Denko and Showa Denko Materials to identify target products/services.



STEP 2

Model contribution plans up to 2030 were created for three target products/services in consideration of the value chain. Following these models, contribution plan development will be expanded to all the major target products/services.

Initiatives for an advanced recycling-oriented society

- ▶ Plastic chemical recycling (page 35)
- ▶ Graphite electrode-driven steel recycling (page 36)

Initiatives for improved QOL

- ▶ Contract development and manufacturing organization for regenerative medical products (page 37)

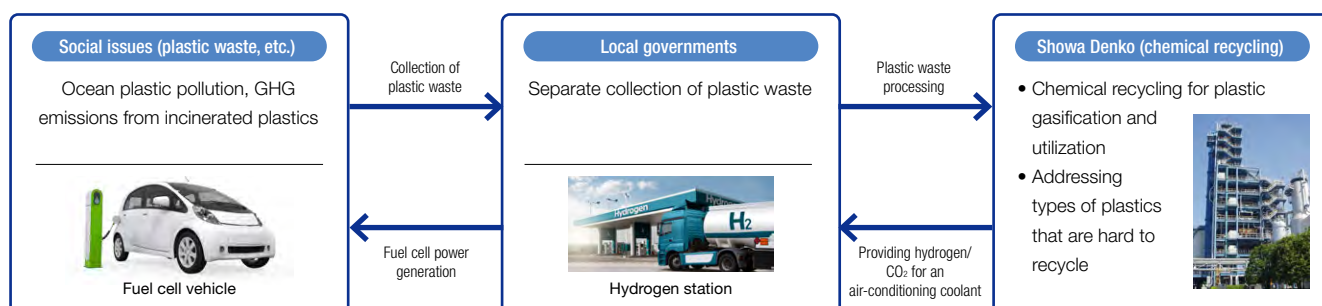
For more details, please visit the related webpages.

Initiatives for an advanced recycling-oriented society

Plastic chemical recycling

Basic approach

We are engaged in plastic chemical recycling to process used plastics into raw materials for manufacturing ammonia, carbon dioxide gas and frozen carbon dioxide. The related processes enable molecular level decomposition of plastic waste, which would otherwise be incinerated, to recover hydrogen for use in manufacturing new products. Showa Denko, being the world's only long-time commercial operator in gasification chemical recycling, will leverage its proven track record to meet mounting social expectations for addressing plastic waste recycling issues, particularly those associated with climate change and marine plastic waste.



Challenge toward 2030 and Showa Denko's initiatives

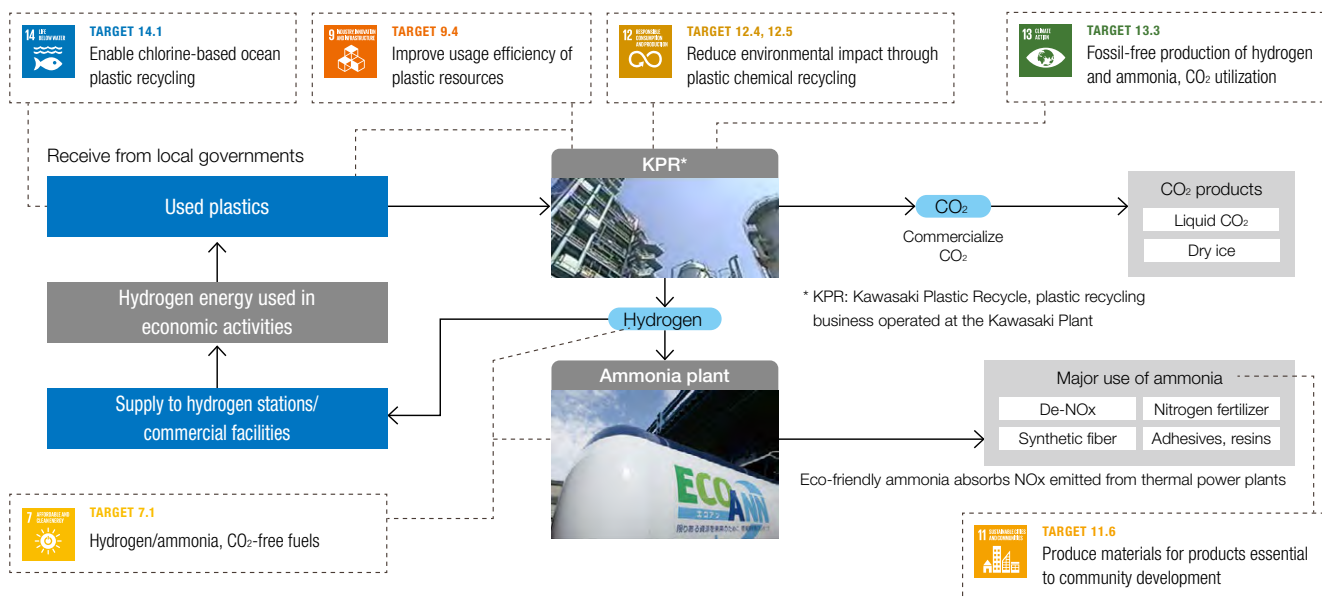
In Japan, the recycling rate of plastic waste approximates 85%, out of which only 5% is related to chemical recycling with most of the remaining portion related to thermal recycling. Recently, international standards have begun to disallow thermal recycling in order to promote proper plastic waste utilization, calling for governments to raise the combined rate of chemical and material recycling to around 70% of the total, including the currently unrecycled portion. To address this situation, Showa Denko will draw on its long-established track record in commercial chemical recycling operations in order to raise the chemical recycling rate through innovating technologies to accommodate types of plastics that are presently hard to recycle, while providing technologies for stable production processes to operators inside and outside of Japan.

Challenges facing society

- Raise chemical recycling rate of plastic resources
Raise Japan's chemical recycling rate from the current 3% to 17%
- Reduce ocean plastic pollution

Showa Denko's initiatives

- Address types of plastics that are hard to recycle to improve the recycling rate
- Provide stable production process technologies developed through years of commercial operations to operators inside and outside of Japan



Promote plastic chemical recycling to achieve zero emissions

Feature Story 2: Tackling SDGs through Business Activities

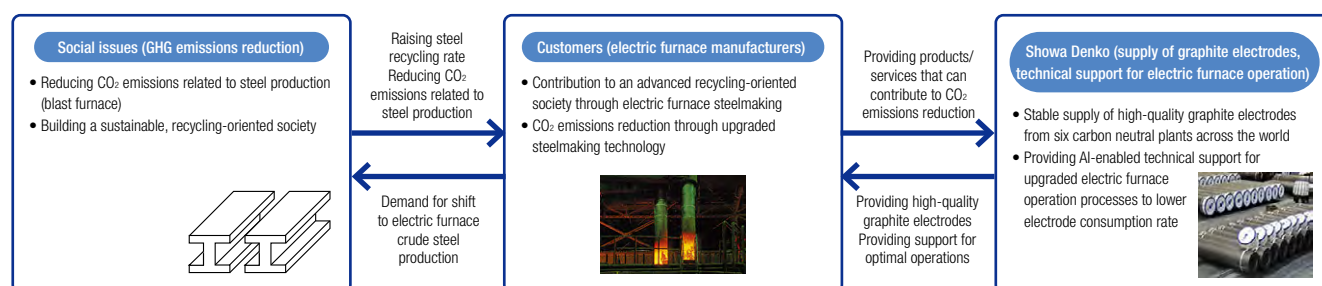
Initiatives for an advanced recycling-oriented society

Graphite electrode-driven steel recycling

Basic approach

Graphite electrodes are best known as a key component of electric furnaces in which iron scrap is melted to be recycled into steel.

In the electric furnace system, electrodes are charged with a high current to cause an arc discharge, a heat source for melting iron scrap. The temperature of liquid steel can reach 1,600°C and that of the electrode tops 3,000°C. Graphite electrodes represent the only currently available industrial material to be functional under such extreme high-temperature conditions. Compared with the conventional blast furnace system, the electric furnace system can reduce CO₂ emissions per unit of crude steel output by 75%, giving rise to expectations for expanded usage of the system for steel production as a contributing factor to decarbonization endeavors. In this context, Showa Denko will work to ensure a stable supply of high-quality graphite electrodes while providing AI-enabled technical support for upgraded electric furnace operation processes, thereby helping popularize steel recycling practices and reduce CO₂ emissions attributable to steel production.



Challenge toward 2030 and Showa Denko's initiatives

Steel recycling represents a long-established, best practice resource recycling system. Electric furnaces produce no more than 30% of the world's total crude steel output at present, but the rate is expected to rise in the future. This outlook is particularly gaining traction in light of rising international calls for reducing GHG emissions to control climate change. Against this backdrop, Showa Denko boasts the world's largest graphite electrode production capacity. It manufactures the product at six plants across the world and delivers it to local markets (according to the local-production-for-local-consumption policy) in an effort to reduce distribution-related CO₂ emissions. The six plants, while working to achieve carbon neutral operations, help users raise the rate of electric furnace steelmaking by supplying graphite electrodes as well as providing support for upgraded steel recycling systems. Also, through the joint venture with AMI Automation, we will provide technical support for upgraded electric furnace operation processes, looking to lower the electrode consumption rate.

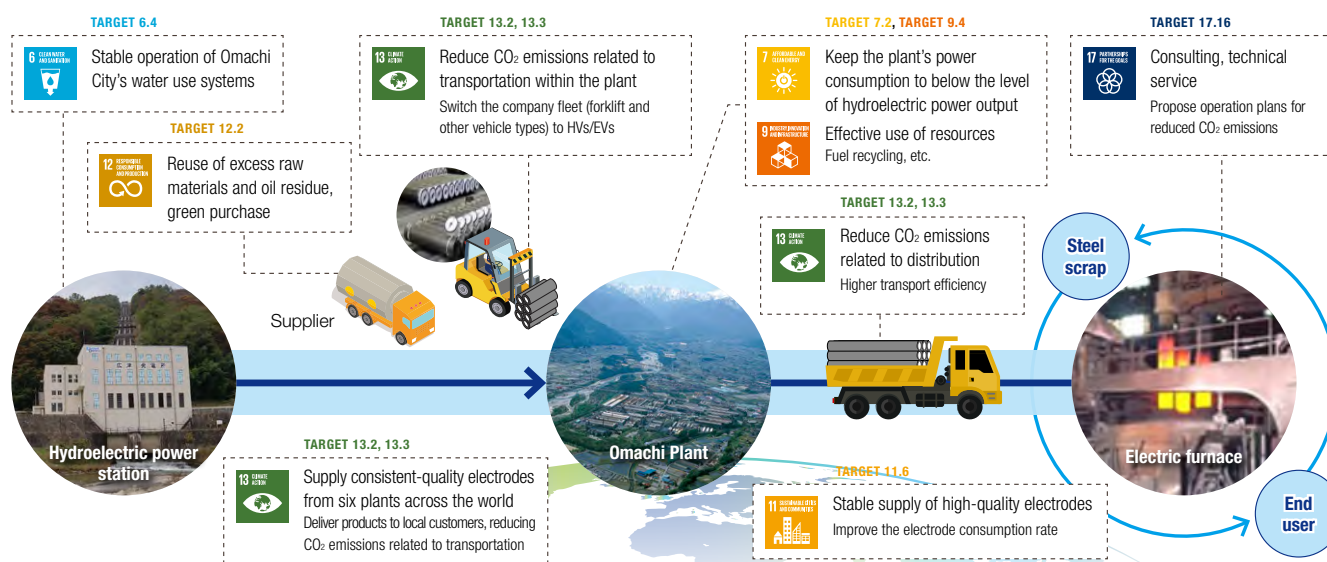
In pursuing the two major recycling projects described above, we seek to contribute to building the kind of advanced recycling-oriented society that is aimed at by the global community.

Challenges facing society

- Reduce CO₂ emissions related to steel production
- Build a sustainable, recycling-oriented society
Raise the world's electric furnace-made steel rate from the current 30% to 35%
- Upgrade electric furnace operation processes to reduce CO₂ emissions related to steel production

Showa Denko's initiatives

- Ensure stable supply of high-quality graphite electrodes from six carbon neutral plants across the world
- Aim to go beyond carbon neutral and become carbon negative at Omachi Plant (power consumption ≤ hydropower output)
- Provide AI-enabled technical support to upgraded electric furnace operation processes to lower electrode consumption rate



Initiatives for improved QOL

Contract development and manufacturing organization for regenerative medical products

Basic approach

Regenerative medicine represents an innovation-led business domain intended to present new treatment approaches for conditions that are difficult to cure using conventional therapies. It should be noted, however, that participants in this sector need to be equipped with highly technical capabilities to address the formidable challenge of effectively handling living cells in order to ensure stable production of high-quality products. In this context, with the hope of contributing to the promotion and development of regenerative medicine, Showa Denko Materials has developed a skilled technical workforce in cell cultivation and quality inspection, and established production bases in Japan, the United States and Europe to provide contract development and manufacturing services to the local pharmaceutical industries. The company's products are delivered to countless patients through its primary customers, pharmaceutical companies.



Challenge toward 2030 and Showa Denko Materials' initiatives

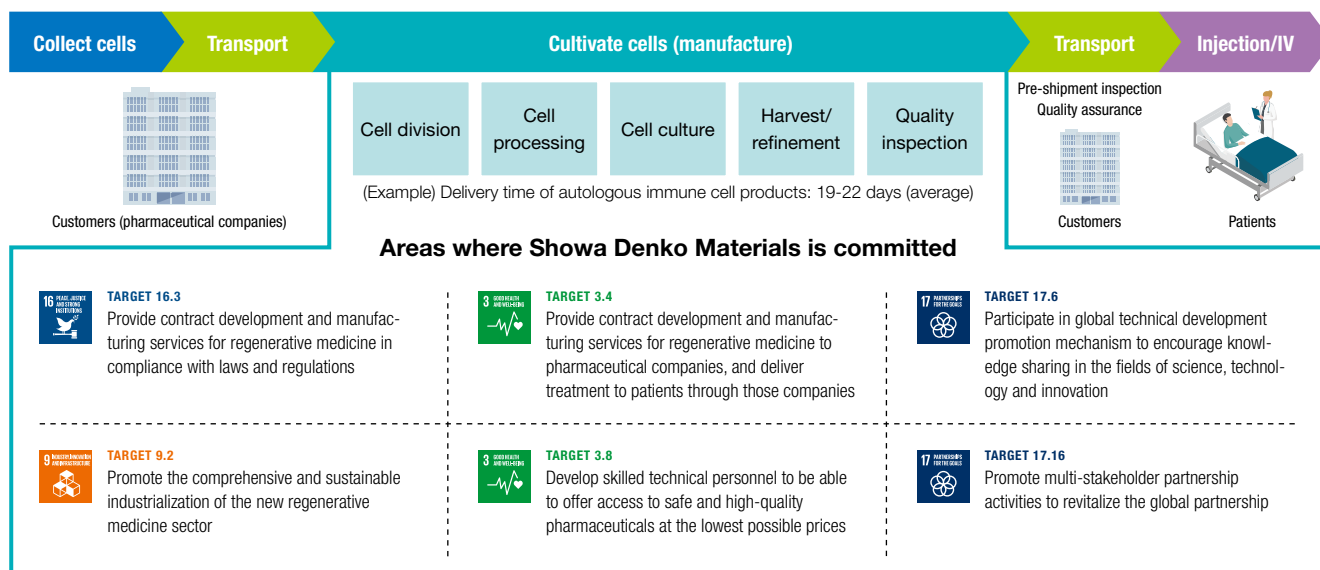
Showa Denko Materials, having established production bases in Japan, the United States and Europe, globally provides contract manufacturing services for regenerative medicine under the brand name of Minaris Regenerative Medicine, known for its stable supply of high-quality products. We are equipped to handle a broad range of cell types, including T cells^{*1}, mesenchymal stem cells^{*2} and iPS cells^{*3}, regardless of whether autologous^{*4} or allogeneic^{*5}, and manufacture regenerative medicine products with quality levels equivalent to those of conventional pharmaceuticals. By supplying safe and effective regenerative medicine products to our pharmaceutical company customers, we contribute to them directly as well as to patients indirectly. In pursuing the regenerative medicine business, we aim to help build a society that can offer options to treat diseases, such as cancer and hereditary disorders, that are difficult to treat using conventional therapies.

Challenges facing society

Promote regenerative medicine to provide treatment for diseases, such as cancer and hereditary disorders, that are difficult to treat with conventional approaches

Showa Denko Materials' initiatives

As a partner of pharmaceutical companies, provide contract manufacturing services for regenerative medicine from production bases in Japan, the United States and Europe, ensuring a high level of quality. In doing so, contribute to the promotion and development of regenerative medicine and work to support the health and well-being of people around the world.



^{*1} T cell: T-lymphocyte, a type of lymphocyte ^{*2} Mesenchymal stem cell: Somatic stem cell that is derived from the mesoderm ^{*3} iPS cell: Induced pluripotent stem cell
^{*4} Autologous: Derived from the same individual ^{*5} Allogeneic: Derived from individuals of the same species that are sufficiently unlike genetically to interact antigenically

CFO Message

We will increase our corporate value by speedily improving our financial structure and implementing SDGs- and ESG-oriented measures from medium- to long-term viewpoints

Motohiro Takeuchi

Representative Director,
Managing Corporate Officer, and
Chief Financial Officer (CFO)



Our approach to setting numerical targets in the long-term vision

The Showa Denko Group is committed to satisfying all stakeholders as its business philosophy.

In order to satisfy all stakeholders, we will implement various measures and foster the generation of synergy effects. To this end, we set our numerical targets in the long-term vision announced in December 2020, including the target for total shareholder return (TSR).

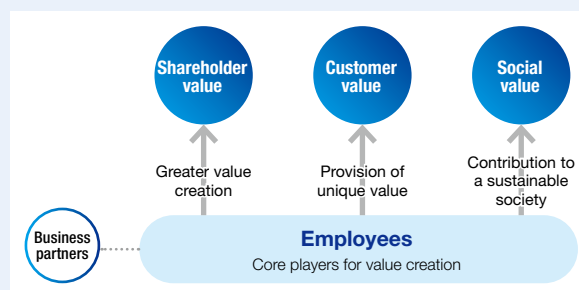
In consideration of the fact that TSR is influenced by stock market trends, we have set the target of being ranked among the global top 25% in the chemical industry for TSR. One of the elements comprising a company's TSR is its stock price. By dividing the company's stock price by its earnings per share (EPS), you can calculate the price-to-earnings ratio (PER). EPS represents the present status of the company and PER its growth potential.

SDGs- and environment, society and governance (ESG)-oriented measures are also included among the factors that will drive the future growth of the company. It will therefore help the Group improve its future financial performance to implement proactive measures to meet social challenges from a long-term viewpoint for 2030 and 2050. Based on this recognition, we will work to solidify the foundation of our business and improve TSR on a medium- to long-term basis, so that our stakeholders can have greater expectations for the future of the Group, while also implementing the SDGs- and ESG-oriented measures.

Our business philosophy

"Satisfy all stakeholders"

We at the Showa Denko Group will provide products and services that are useful and safe and exceed our customers' expectations, thereby enhancing the value of the Group, giving satisfaction to our shareholders, and contributing to the sound growth of international society as a responsible corporate citizen.



Approach to management indicators

- Be committed to TSR as a comprehensive indicator for higher corporate value
- As drivers to increase TSR (%), set EBITDA margin (%) as a KPI for business strategy and net D/E ratio as a KPI for financial strategy.

	2020 results* ¹	2021 forecasts* ²	2025	2030
TSR (%)	Aim to be among the top 25% in the chemical industry on a medium- to long-term basis			
Net sales (Trillion yen)	1.25	1.35	1.6	1.8–1.9
EBITDA (Billion yen)	89.7	188.1	320.0	—
EBITDA margin (%)	7.2%	14.0%	20%	—
ROE (%)	–20.3%	—	15%	—
Net D/E ratio (Times)	1.84	—	Close to 1.0	—

*1 Annualized figures calculated by including the following in the calculation target: January to June 2020 results recorded by Showa Denko Materials under the institutional accounting system and the amount equivalent to that of goodwill amortization posted in the second half of 2020.

*2 Publicly announced on May 10, 2021

Remuneration system

In order for directors and corporate officers to steadily commit themselves to the achievement of the Showa Denko Group's targets and the improvement of its corporate value, we will link part of their remuneration to the management indicators. We are now conducting examinations to specify the indicators to which the remuneration will be linked and will decide on the weights to be given to each of the items. We include TSR, EBITDA margin, ROE and the net D/E ratio in the examination target.

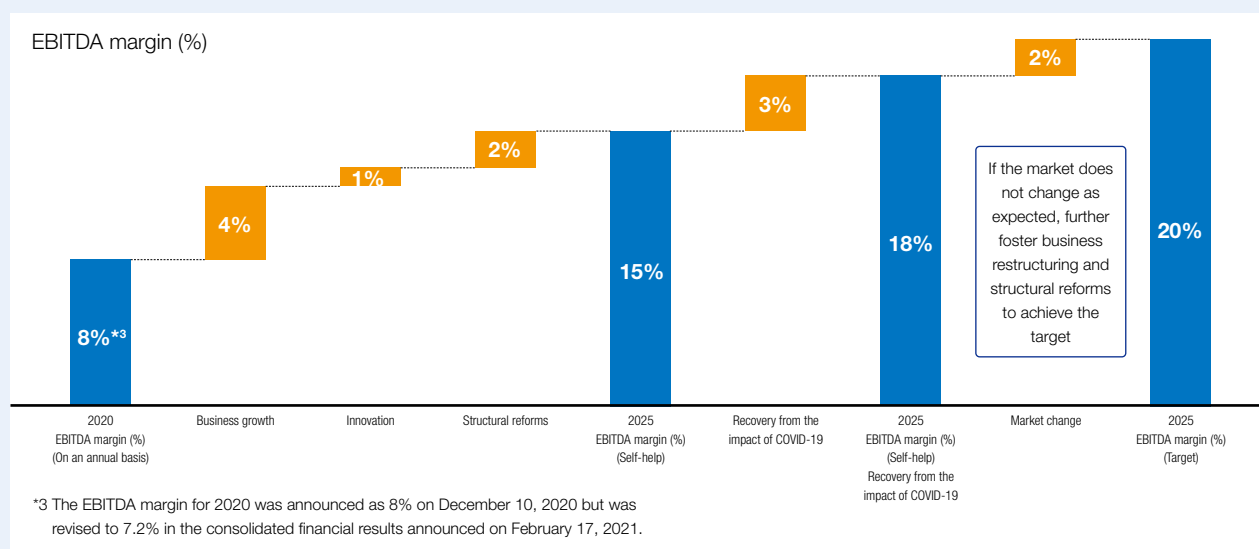
Approach to building the remuneration system

- As stated in the business philosophy, require directors and corporate officers to commit to satisfying all stakeholders.
- Link remuneration for directors and corporate officers to the management indicators to encourage a greater commitment by executives to making achievements as a management team.

Drivers for higher profitability toward 2025

For fiscal 2020, we posted an EBITDA margin of 7.2% (on an annual basis). In and after fiscal 2021, we will work to increase the margin to 15% by achieving growth, mainly in the electronics and mobility fields, and by fostering innovation and structural reforms. We also aim to improve it to 20% by fiscal 2025, in anticipation of recovery from the impact of COVID-19 and in consideration of the changes to be made to the market. Even if market conditions do not change as expected, we will still achieve the targeted 20% by further fostering business restructuring and structural reforms.

Achieve an EBITDA margin of 20% by 2025 through business growth and innovation, mainly in the electronics and mobility fields, and also through structural reforms and recovery from the impact of COVID-19



CFO Message

Synergies generated on a short- to medium-term basis

For the Showa Denko Group to achieve sustainable growth, it is important for it to have a highly selective business portfolio and to maximize its organizational productivity. To this end, on a short- to medium-term basis, specifically during the period leading up to fiscal 2023, we will sell some businesses in the business portfolio restructuring^{*4} process and also implement measures to improve our profit structure and streamline our assets, and work for the full integration of the two companies.

(1) Business portfolio restructuring

As a result of the integration between Showa Denko (positioned in the midstream section of the value chain) and Showa Denko Materials (positioned in the downstream section of the value chain), we have established a new portfolio comprising the “Core Growth,” “Next-Generation,” “Stable Earnings” and “Fundamental Technologies/Materials” businesses. By clearly categorizing our businesses like this, we can now manage our business portfolio in a more strategic manner.

We are also conducting examinations and negotiations to sell some of our businesses as part of the business portfolio restructuring process.

As of July 2021, we have decided on the following plans: selling off two of Showa Denko's businesses (aluminum cans, aluminum rolled products) and four of Showa Denko Materials' businesses (food wrap film, printed wiring boards, ceramics, energy storage devices/systems); and accepting a public tender offer for our shares of SHOKO CO., LTD., a consolidated subsidiary of Showa Denko. Through these, we have made a certain degree of progress in restructuring our business portfolio. We will continue to pursue appropriate business portfolio management to ensure the Group's sustainable growth and realize the Long-Term Vision.

(2) Measures to improve the profit structure and streamline the assets**1) Measures to improve the profit structure**

As synergies to be generated through the integration of the two companies, we aim to reduce our costs by about ¥28 billion in total relative to the fiscal 2019 level by the end of 2023, in addition to increasing revenue from sales. We will achieve this cost reduction specifically by reducing the materials and logistics cost, improving our productivity, reducing rental charges and optimizing our operations.

Measures	Increase in revenue (2023, billion yen)
Improvement of revenue from sales	3.0
Reduction of purchasing and logistics cost	3.0
Improvement of productivity	2.0
Reduction of rental charges	1.0
Reduction of other expenses	7.0
Optimization of operations (structural reforms)	12.0
Total	28.0

In addition to these measures, we will earn more from the sale of new products and through cross-selling, while also steadily implementing measures to reduce materials cost, consolidate our operation sites, and improve productivity to make even more achievements through the integration.

2) Streamlining of assets

As part of measures to foster our financial soundness, we also implemented measures to streamline our assets by making improvements to working capital as well as by selling off marketable securities, including cross-shareholdings. For this, we had planned to achieve the target of ¥50 billion by the end of 2021 but were able to achieve it earlier than planned by reaching the level of ¥73 billion before the end of 2020.

We will conduct examinations to implement additional measures on a medium- to long-term basis.

3) Integration as an organizational entity

Showa Denko and Showa Denko Materials will be integrated into a single corporate entity in January 2023.

Preparation programs will get underway in July 2021, with the integration of the head offices scheduled for August. This will effect a substantial cost saving, chiefly due to the reduction of rental charges, shared use of systems and joint procurement.

For 2021, despite some remaining impact of COVID-19, we will be able to recover our business performance thanks to demand for semiconductors, which has been brisk, and also due to the fact that the supply of graphite electrodes and other products is becoming tight. We will further speed up our measures to grasp the opportunities provided by these favorable trends.

^{*4} For details, please see “Portfolio management for sustainable growth” on page 29.

Summary of short- to medium-term targets

Business portfolio restructuring

- Foster restructuring and sell businesses at a total price of ¥200 billion on an enterprise value (EV) basis

Profit structure improvement / Asset streamlining

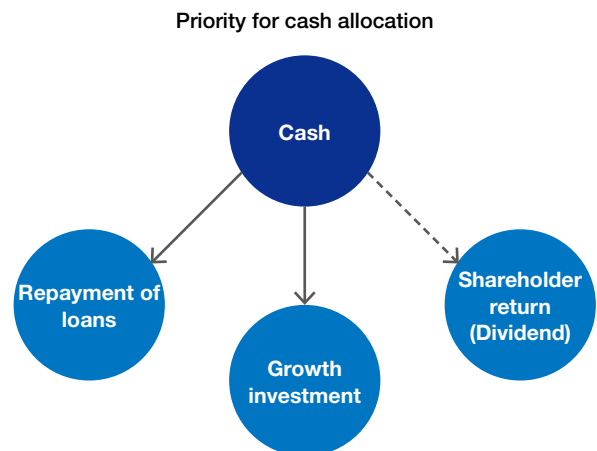
- Reduce direct/indirect costs through integration
- Make improvements to working capital and sell off marketable securities, including cross-shareholdings

Organizational integration

- Accelerate the date of substantive integration one year, from January 2023 to January 2022
Preparations were started in 2021, with head office integration in August 2021
- Corporate entity integration to be completed in January 2023

Shareholder return policy

As for cash gained through future business growth and the sale of businesses, in consideration of the post-integration situation, for the time being we need to prioritize to some extent allocation to the repayment of loans and to growth investment to increase profit. While improving our balance sheet by repaying loans and bringing our net D/E ratio close to 1.0, we will make investments in growth businesses. After meeting these preconditions, we will pay a stable dividend to the extent possible. As for our medium- to long-term shareholder return policy, we will again work to increase our total payout ratio to 30%, after getting the net D/E ratio close to 1.0 and achieving a certain degree of business growth.



In consideration of the post-integration situation, we need to prioritize to some extent the repayment of loans and growth investment to increase profits.

Toward the future

To avoid missing any opportunities for the Showa Denko Group's growth, we need to improve our growth strategies and financial structure, operate our risk management and corporate governance systems in an appropriate manner, and embrace diversity in the workplace. For the time being, we will focus on the enhancement of our profit and financial structures, although we also regard shareholder returns as a priority.

As CFO, I regard it as my role to increase the Group's corporate value and promote constructive dialogue with shareholders and investors. I will work to communicate our future growth forecasts and financial performance to them to provide them with sufficient materials that they can use to determine the corporate value of the Group.

Also, for the SDGs and SDGs, we will show progress with the measures that we are implementing to achieve the predefined targets. We will clearly set and state our scenarios to contribute to meeting social challenges including the SDGs for each of our core businesses and products.

I also think it is necessary to implement measures for digital transformation (DX) in a systematic manner, and we plan to formulate a DX strategy for the newly integrated company. We have already been using AI in some of our businesses and at some of our operation sites. For example, we are speeding up the development of materials by the use of AI and big data (materials informatics) and are operating AI-based abnormality detection systems at our plants. We will conduct similar programs across the Group, and also collect data sets from operating programs to be linked to various information systems and IT infrastructure under redevelopment so as to boost functions to satisfy customer needs. By carrying out these activities, we will accelerate our company-wide business model transformation.

Through the integration of Showa Denko Materials, the Showa Denko Group is making a fresh start. The purpose of the reborn Group, to "Change society through the power of chemistry," means that the Group will contribute to a sustainable global society from the viewpoint of the SDGs and ESG while also achieving its own growth in an integrated manner. We will clearly show, both internally and externally, that our basic management stance is aligned with the international trend for sustainability and will strive to demonstrate to our stakeholders that Showa Denko is becoming a corporate entity that can fulfill its purpose.

I would ask that you continue to support the Showa Denko Group.

Digital Transformation (DX) Initiatives

Putting together an extensive range of information related to product LCA and production processes, so as to optimize overall value chain operations, thus contributing to an advanced recycling-oriented society

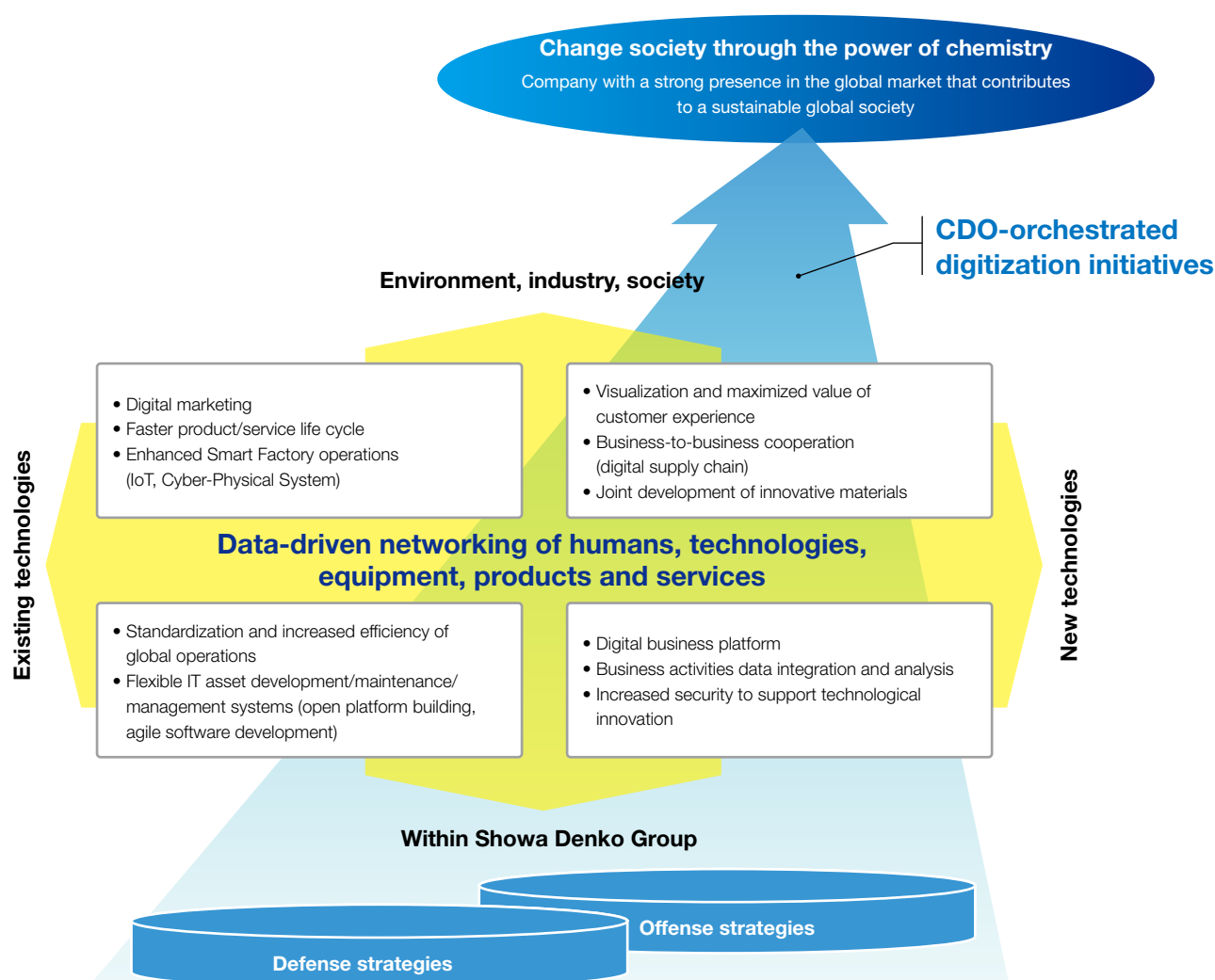
The Purpose of the Showa Denko Group is to “change society through the power of chemistry,” and this includes contributing to the development of a sustainable global society by creating functions required of the times as an advanced materials partner. In order to accomplish this Purpose, it is crucially important to implement digital transformation (DX) initiatives in every aspect of our business activities.

To the above end, we are presently focusing on “defense” strategies—specifically for solidifying business foundations as well as standardization and increased operational efficiency—which are aimed at maximizing the synergetic effects resulting from the integration. Major examples are related to IT infrastructure built to provide a more convenient and higher-security work environment. This has enabled employees at each base both inside and outside of Japan to work from any place at any time, an essential condition for work style options accommodating the New Normal standard. It has also helped increase security for information sharing with customers and other external parties, a key factor to facilitating open innovation activities.

At the same time, we will also be pursuing “offense” strategies to transform business models. A number of plans have been launched

to run AI and IoT-based programs to improve efficiency and yield in business, production, and R&D operations, and some of them have begun to produce results. In addition to implementing DX programs for each business and product to enhance performance and energy efficiency, we are planning to develop and market packaged products or services based on these digital technologies. Additional plans are under consideration to develop a database program related to product life cycle assessment (LCA; pre-use [production], in-use [operation], post-use [disposal/reuse]) in order to provide relevant sets of data to customers and suppliers, and with a view to contributing to an advanced recycling-oriented society.

The above-described initiatives are implemented under the leadership of the Chief Digital Officer (CDO) Preparation Office, which is also responsible for examining future DX strategies. In view of the whole value chain for digital technologies, ranging from technical exploration, development and procurement to operational reform, implementation and operation, we will carry out DX initiatives to prepare ourselves to “change society through the power of chemistry.”



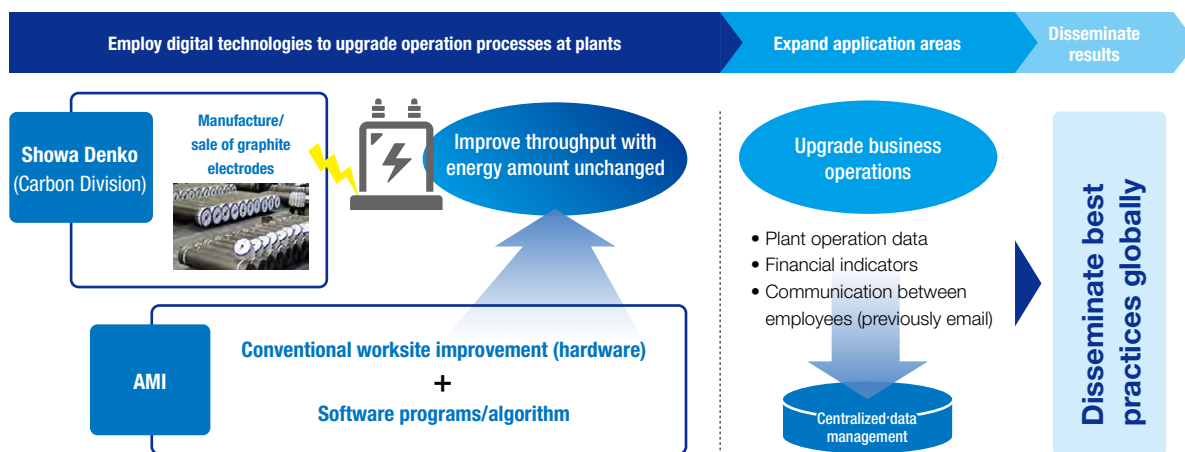
Case 1

Digitization for graphite electrode production and marketing

The Showa Denko Group has acquired a stake in AMI Automation (“AMI”), a Mexico-based industrial automation solution provider, effective February 2021. AMI ranks as the world’s best in EAF operation optimization software and electrode regulation systems. Our plan is to combine AMI’s programs and systems with our electric furnace graphite electrodes so as to create a new business aimed at maximizing customer value.

In addition, we have begun to introduce AMI’s digital technologies to sophisticate our production processes. One target site is located in South Carolina, where a couple of programs are underway, such as computer simulations conducted to analyze the effect and viability of equipment performance enhancement plans, and layout design of data collection points to improve data collection efficiency.

Going forward, we will utilize the results of demonstrated programs for application to the Group’s various business and production processes in order to accelerate our digitization initiatives.



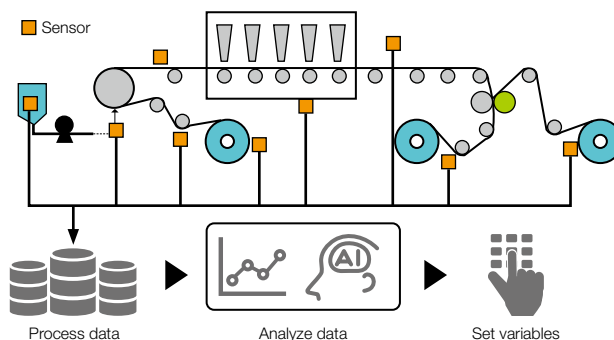
Case 2

Digitizing engineering artisanal skills to improve production efficiency

Showa Denko Materials' Yamazaki Works has introduced AI-based programs to major processes involved in the manufacture of photosensitive films used to form printed circuit boards for electronic devices.

One key challenge for producing high-quality films is the large number of numerical variables that must be set to meet the many different detailed requirements for each product. In order to produce a wide variety of films in response to customer needs, the task of setting variables is usually performed several times a day, and requires “artisanal” skills based on long experience.

Deciding to digitize these “artisanal” skills, Yamazaki Works has adopted an AI-based machine learning algorithm to comparatively process and analyze data for set variables and resulting product qualities. This program has dramatically increased production efficiency through a distinctively faster setting process, and has also lowered the defect rate to a marginal level through eliminating the risk of human error.



Digital Transformation (DX) Initiatives

Case 3 Demonstrating AI-enabled speed-up of flexible transparent film development

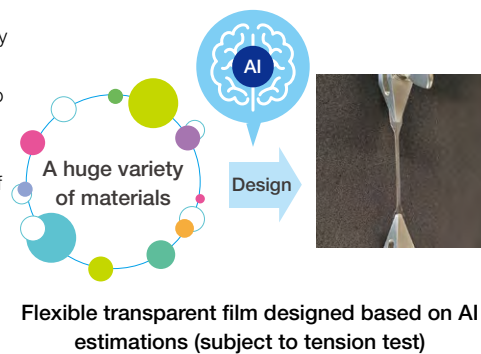
Showa Denko and Showa Denko Materials, along with 16 other materials manufacturers, are engaged in a joint research project known as the Ultra High-Throughput Design and Prototyping Technology for Ultra Advanced Materials Development project (Ultra-Ultra PJ) hosted by the New Energy and Industrial Technology Development Organization (NEDO). The aim is to create new technologies to significantly shorten the time for functional materials development by appropriately combining multiple technologies related to computational science, process engineering and measurement.

In this project, Showa Denko has been working on the design of flexible transparent film, an essential component of mobile devices, since 2016. The film needs to be equipped with various properties, which often trade off each other, making it difficult to achieve full compatibility among a large number of properties. To address this, Showa Denko has created an AI-based optimal design program, seeking to significantly cut down the number of tests and thus reduce the development time.

In 2020, the project team conducted an experiment to compare films designed by the AI data learning program and those prepared by skilled researchers with respect to performance levels and the number of tests required for improvement to achieve the required levels. The results proved the ability of the AI program to reduce the number of tests to one twenty-fifth (1/25) or less of that required for films designed by skilled researchers. The findings also suggested the possibility of the AI program exhibiting better performance.

Also, Showa Denko Materials is working on AI-programmed resin composite materials design. Showa Denko and Showa Denko Materials have started to discuss joint efforts to promote the utilization of AI technologies. The two companies will refine these technologies and apply them across the Group, with the aim of innovating R&D operations.

Note: This is a JPNP16010 project commissioned by the New Energy and Industrial Technology Development Organization (NEDO).



Case 4 Digitizing handwritten technical documents to facilitate data utilization and transfer of technical knowledge

Showa Denko, together with Cinnamon Inc., developed an AI-based database program to facilitate the utilization of technical documents and has begun to apply it for internal use.

The company retains large quantities of technical documents containing valuable knowledge accumulated over the course of years from the time of its founding. However, most of these documents are on paper, a medium unsuitable for information search, thus lowering efficiency in production operation and knowledge transfer.

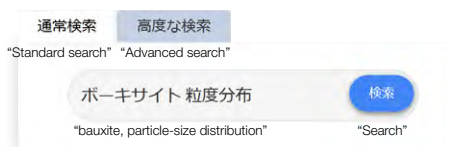
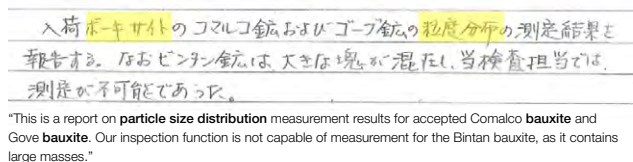
To address this issue, we launched the above joint project in 2018, when it was selected to receive a research grant from NEDO, to develop an AI-enabled program to read in text from paper documents, including handwritten characters, and digitize the read-in data with high levels of accuracy.

We worked to refine the machine learning function to improve data reading accuracy and establish effective fuzzy search* processes in order to overcome the limitation of existing automatic OCR systems, which are incapable of accurately reading atypical forms of text, including handwritten characters, a principal problem with many technical documents. In 2020, after two years of technology verification, we began to run the program at some sites.

We will continue with this endeavor to improve the accuracy and performance of the program while introducing it to many other Group bases, including those of Showa Denko Materials, seeking to retrieve valuable and as-yet untapped knowledge from past documents buried deep within the Group to be utilized to hone our competitive edge.

* Fuzzy search: Technique of finding strings that match a pattern approximately rather than exactly

Technical document retrieval program running (screenshot) in case of searching for “bauxite” by “particle size distribution”



Organizational Integration

Showa Denko K.K. and Showa Denko Materials Co., Ltd. are scheduled to be fully integrated as a legal corporate entity in January 2023. The two companies are steadily moving forward with integration processes.

Cooperation between head office (R&D) functions

Showa Denko is constructing the “Stage for Fusion” in Yokohama City as a key facility to bring together a diverse range of otherwise geographically dispersed technologies belonging to Showa Denko and Showa Denko Materials and thereby create synergies. Also, at the Packaging Solution Center opened by Showa Denko Materials in 2019, collaborative open innovation initiatives are being pursued in earnest in addition to the proposal of solutions for advanced materials combination and comprehensive process designs.

Bring together a diverse array of technologies held by the Showa Denko Group to solve various social issues, with the aim of helping the sustainable development of society

Overview of “Stage for Fusion” (Yokohama City, Kanagawa Prefecture)



Scheduled to be completed in spring 2022

- Create and pursue R&D themes to contribute to the sustainable development of society
- Serve as a cross-organizational support center to provide cross-sectoral technical support to link technologies from a broad range of fields
- Being open to the public locally and globally, provide an open innovation platform and other functions to promote collaboration with external partners

Example themes

Development of materials and composites for next-generation high-speed communication



Leverage Showa Denko's ceramic and organic synthesis technologies and Showa Denko Materials' composite technologies to create elemental technologies and new materials required in the 5G era

Creation of a platform from the perspective of SDGs/ESG investment



Set and pursue R&D themes in pursuit of solutions to environmental and social issues and SDGs challenges

Collaborative development center for cutting-edge semiconductor packaging innovation looking to facilitate next-generation semiconductor development

Packaging Solution Center (Kawasaki City, Kanagawa Prefecture)



- Promote collaborative open innovation, in addition to proposing solutions for advanced materials combination and comprehensive process designs
- Organize a variety of activities to facilitate next-generation semiconductor packaging technology development

Example themes

Development of fan-out packaging materials for next-generation mobile devices



In 2018, establish JOINT, a consortium of semiconductor device and materials manufacturers, in Shinkawasaki. Encourage collaborations with partner companies to propose solutions to customers.

Development of 2.xD/3D packaging materials for AI chip and other semiconductor elements



2.xD/3D package

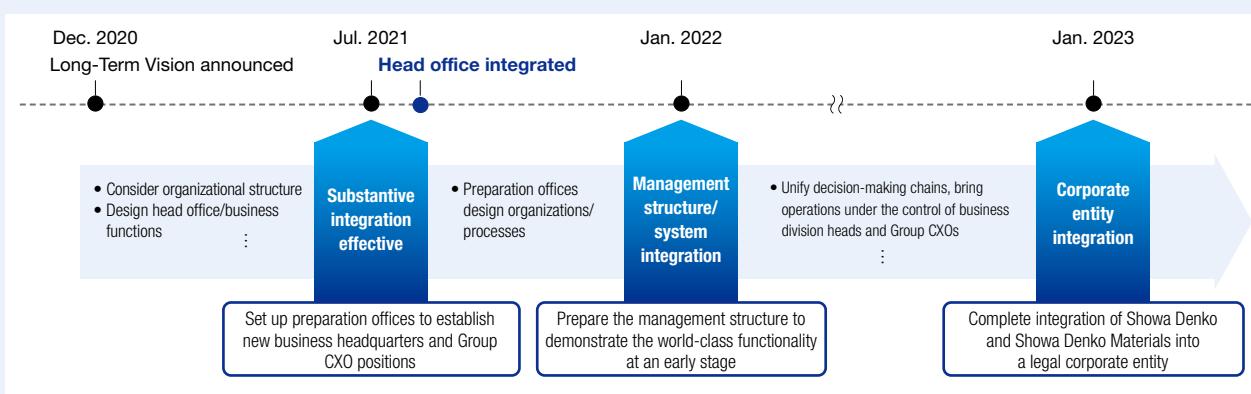
Establish JOINT 2 by adding substrate manufacturers to the former consortium. Build an evaluation platform using government grants, accelerating cooperative efforts to establish evaluation technologies and enhance materials development.

Organizational Integration

Project progress, integration milestones

In April 2020, Showa Denko and Showa Denko Materials established steering committees to lead the integration project. The committees are composed of directors and employees from each of the two companies, who discuss issues related to organizational structures, design of head office/business functions, and activities at the newly integrated company under the supervision of Showa Denko's Board of Directors. Based on the result of the discussions, preparation offices for establishing new business headquarters and CXO positions were set up within Showa Denko's head office in July 2021 coincident with the start of the substantive integration phase, which aims to unify management processes related to important group management policies by January 2022. Each preparation office has been tasked with discussing integration issues under the leadership of the newly selected head of each office, toward the milestone goal of completing the legal integration as a single corporate entity in January 2023. The cumulative total integration-related costs for the period from 2021 to 2023 are estimated at ¥16 billion.

Integration process has been accelerated by starting preparations in July 2021, with head office integration in August 2021. Thus, substantive integration will be realized in January 2022, one year ahead of legal corporate entity integration in January 2023.



Substantive integration effective

Substantive integration became effective when preparation offices were set up within the head office of Showa Denko to establish new business headquarters and CXO positions to lead post-integration businesses. Based on the advances already made, we will accelerate the integration process, preparing the management structure to demonstrate world-class functionality at an early stage, while implementing integration-related programs, including joint operation of the management committee, as planned.

Preparation offices set up to establish new business headquarters and CXO positions

To accelerate the organizational integration process, preparation offices were set up within the head office of Showa Denko to establish new business headquarters and CXO positions, effective July 1, 2021. From this time on, important issues concerning the integration will be discussed under the leadership of the newly appointed head of each office.

- Preparation Office for Electronics Business Headquarters
- Preparation Office for Mobility Business Headquarters
- Preparation Office for Advanced Functional Materials Business Headquarters
- Group CFO (Chief Financial Officer) Preparation Office
- Group CSO (Chief Strategy Officer) Preparation Office
- Group CRO (Chief Risk Management Officer) Preparation Office
- Group CHRO (Chief Human Resources Officer) Preparation Office
- Group CTO (Chief Technology Officer) Preparation Office
- Group CMEO/CQO (Chief Operations, Manufacturing and Engineering Officer/Chief Quality Officer) Preparation Office
- Group CDO (Chief Digital Officer) Preparation Office
- Group CMO (Chief Marketing Officer) Preparation Office

Joint operation of management committee

In order to facilitate the early integration of decision-making functions, jointly operate the management committee of the two companies, starting from July 26, 2021.

System integration

Implement system integration in some areas, such as purchase, environment/safety, patent search, and marketing automation

Head office integration

Integrate the head offices of the two companies, effective July 19, 2021, locating the head office of the new company in Shiba Daimon Minato-ku, Tokyo and the secondary head office in Marunouchi Chiyoda-ku, Tokyo.

Launch of integrated intranet

Launch the integrated intranet of the two companies on July 1, 2021, starting with the posting of messages and updates to be shared by employees of both companies

Initiatives Supporting Sustainable Growth

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an Outside Director and an Outside Member of the Audit & Supervisory Board
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Corporate Officers

Stakeholder Communications

With the integration of Showa Denko and Showa Denko Materials, the scale of the Showa Denko Group's business will significantly expand. We recognize that this will create new value that neither company has achieved on its own, making no small impact on stakeholders, society and the environment.

Active communication with all stakeholders, including customers, shareholders and investors, employees, local communities and suppliers, is essential for the Showa Denko Group to grasp their demands and expectations and to grow and develop together with society.

With the purpose of "change society through the power of chemistry," we will identify issues of materiality that the newly integrated company should focus on and address them through cooperation with stakeholders.

Ideas about Communications with Stakeholders

Shareholders and investors

We are conducting IR activities to disclose the vision, strategies and corporate information of the Showa Denko Group to shareholders and investors in an easy-to-understand, timely and appropriate manner so that they may deepen their understanding of and trust in the Group through active dialogue.

Employees

We aim to nurture a corporate culture that allows employees as "core players for value creation" to work in good health, with vigor, with satisfaction, and with pride. We are launching various programs to foster unity among Group employees.

Customers

Besides ensuring a stable supply of safe and reliable products to customers, we are providing products and services that exceed the expectations and imagination of customers by integrating diverse technologies of Showa Denko and Showa Denko Materials and proposing solutions across our supply chains.

Local communities

We are collaborating with residents of local areas where we operate our business to solve social issues for the sustainable development of their communities by engaging in dialogue with them in good faith to deepen mutual understanding and by using the "power of chemistry."

Suppliers

We are not only striving to earn trust from our suppliers but also working together with them to solve environmental and social issues across the supply chain in order to achieve a sustainable society and mutually increase our respective corporate value.

Showa Denko Group

Materiality

Current issues of materiality and toward the future

Current issues of materiality

Showa Denko

Showa Denko first identified its issues of materiality in 2015.

In 2019, in order to clarify, both internally and externally, the social tasks to be prioritized by the Group, Showa Denko has classified 14 material issues into three core task groups, and then set the medium-to long-term policy for each of the tasks. It has also set specific KPIs for each of the material issues and implemented initiatives based on the KPIs to make achievements in a steady manner.

Core tasks	Materiality
Contribution to achievement of SDGs through business activities	• Provision of products, technologies and services • Access to essential services • Consumer safety and health protection • Participation in community activities
Tackling environmental issues	• Prevention of pollution • Measures against climate change • Use of sustainable resources
Establishment of sustainable methods for human resource development and improvement in working environment	• Development of human resources • Creating a comfortable workplace • Equipment safety • Occupational health and safety • Thorough corporate ethics • Protection of intellectual property • Decision-making process and structure

Showa Denko Materials

Showa Denko Materials first identified its issues of materiality in 2013.

It has updated its issues of materiality in line with the Medium-term Management Plan. Following the first update in 2015, the second update took place in 2018. It has used the materiality in its review of the main policies of the 2021 Medium-term Management Plan, and set key measures and KPIs for each of the material issues to work toward sustainable growth. (Note: KPIs are internal indicators and are not disclosed.)

Materiality
• Strengthening ability to discern true needs   • Strengthening business designing ability to enhance business value-added   • Strengthening technology platform   • Improving productivity globally   • Strengthening financial standing   • Promoting diversity & inclusion to strengthen corporate competitiveness   • Strengthening group governance   • Timely and appropriate communication with stakeholders   • Implementation of social responsibility in the entire value chain   • Pursuing businesses that offer solutions to environmental and social issues

Toward the future

As a corporate group integrating Showa Denko and Showa Denko Materials, we will identify the issues of materiality of the newly integrated company in order to achieve sustainable growth together with society.

Considering the material issues of the two companies, as well as the strengths and the external environment that the integration will bring about, we are identifying and analyzing the social and environmental issues that the newly integrated company should focus on.

New material issues analysis process



Materiality

Performance regarding material issues

In 2019 Showa Denko set KPIs, or indicators for achievements, for issues of materiality based on what the Showa Denko Group should look like in the lead-up to the SDGs target year of 2030. The results in 2019 and 2020 are provided below (the results of Showa Denko Materials are not included).

The issues of materiality and KPIs will be reviewed in light of the integration with Showa Denko Materials.

Note: Current issues of materiality and KPIs of Showa Denko Materials are internal indicators and are not disclosed.

Core tasks	Materiality	Medium to long-term target (KPI)	Results in 2019	Results in 2020
Contribution to achievement of SDGs through business activities	Provision of products, technologies and services	Create SDGs contribution stories for all main products and execute the PDCA cycle	Selected 2 products (graphite electrodes and KPR) as products contributing to the SDGs	Certified 6 products (including graphite electrodes and KPR) as products contributing to the SDGs Note: Showa Denko Materials also certified 7 products (see "Feature Story 2: Tackling SDGs through Business Activities" on page 34)
	Access to essential services	Ensure supply in response to customers' needs	Stably supplied sodium hypochlorite used for sterilizing tap water (There was no water system suspension caused by the product)	Same as at left
	Consumer safety and health protection	Reduce the number of complaints about quality (calculated based on Showa Denko's criteria) to 40 or below by 2030 (Showa Denko [unconsolidated] and Group companies in Japan)	51 complaints	25 complaints Improved due to implementation of preventive measures against risks of complaint occurrence at each site
		Achieve 100% product risk assessment rate by 2030 (on the basis of SDS issuance)	— (Aggregation started with results from 2020)	25%
	Participation in community activities	At each site in Japan, plan activities to contribute to the local community according to the needs of the community and continue voluntary operation	Developed a policy for participation in community activities and developed activity plans according to local needs at each site	Contributed to local communities by donating the proceeds from aluminum can recycling activity, etc. despite reduction or suspension of plant tours due to the COVID-19 pandemic

Core tasks	Materiality	Medium to long-term target (KPI)	Results in 2019	Results in 2020
Tackling environmental issues	Prevention of pollution	Maintain the final landfill rate of industrial waste at 0.5% or lower by 2030 (Showa Denko [unconsolidated] and Group companies in Japan)	0.35%	0.27% Improved due to reduction in shutdown maintenance
		Increase the plastic waste effective utilization rate to 75% or higher by 2030 (Showa Denko and Group companies in Japan)	68.6%	74.7% Improved due to improvement in effective utilization rate at each plant
		Reduce the discharge of chemical substances to 360 tons or below by 2030 (Showa Denko [unconsolidated] and Group companies in Japan)	Discharge into air 628 tons Discharge into water 15 tons	Discharge into air 500 tons Discharge into water 13 tons Improved due to introduction of combustion facilities at some plants
	Measures against climate change	Reduce GHG emissions by 11% relative to the 2013 level by 2030 (Showa Denko [unconsolidated] and Group companies in Japan)	Reduced by 6.9% relative to the 2013 level	Reduced by 10.7% relative to the 2013 level
	Use of sustainable resources	Continue to reduce the amount of water used at all plants according to the reality of each plant	Promoted effective water use company-wide	Same as at left

Core tasks	Materiality	Medium to long-term target (KPI)	Results in 2019	Results in 2020
Establishment of sustainable methods for human resource development and improvement in working environment	Development of human resources	Continue to provide selective training courses for next generation of leaders in Japan and select at least 20 participants annually by 2030	Provided a selective training course for acting section managers in which 20 employees participated	Planned to provide a selective training course for assistant departmental managers and section managers in 2020 but cancelled it due to the COVID-19 pandemic
		Increase the percentage of non-Japanese in the Group's managerial human resource development program to that equivalent to the Group's overseas sales ratio by 2030 (at least 200 people over the decade from 2020 to 2029)	Provided the Global Executive Development Program for excellent global employees in which 4 among 13 participants were national staff from overseas Showa Denko Group companies	Cancelled in-person training due to the COVID-19 pandemic, but provided education for global next-generation leaders, including interviews and training programs using IT, on a continuous basis
		Achieve a proportion of female managers that is 10% of the total number of managers (section managers and those in higher positions) in Japan by 2030 (Showa Denko [unconsolidated])	4.9%	5.3% Increased as the number of female employees who passed the manager examination increased and as employment of female managers for mid-career recruitment continued
	Creating a comfortable workplace	Continue to renovate aging employee facilities in Japan in a sequential manner to provide employees with safe and clean workplaces	Allocated a budget for the renovation of employee facilities and did renovations (of bachelors' dormitory, etc.)	Same as at left
		Continue to maintain employees' annual paid leave utilization rate at more than 70% by 2030 (Showa Denko [unconsolidated])	74.1%	71.6%
		Increase the percentage of "vibrant employees*" in the triennial employee satisfaction survey by 5% per survey * Employees who have positive views on employee engagement (commitment to the organization and voluntary efforts) as well as on the working environment (assignment of the right people to the right places and comfortable workplaces)	Held workshops for managers at major plants to improve the issues in communication between managers and their subordinates that were identified in the previous survey (in 2017)	Initially planned to conduct the employee satisfaction survey in 2020 but postponed it to 2021 in light of the integration with Showa Denko Materials
	Equipment safety	Achieve and maintain zero equipment-related accidents by 2030 (Showa Denko [unconsolidated] and Group companies in Japan)	10 accidents	4 accidents Improved due to initiatives such as listing all potential risks and crisis awareness education
	Occupational health and safety	Achieve and maintain zero lost-time incidents by 2030 Showa Denko and Group companies, and partner companies in Japan	15 lost-time incidents, 4 non-lost-time incidents	3 lost-time incidents and 8 non-lost-time incidents Enhanced risk reduction activities and promoted measures to improve the safety level
		Continue to be named among the 500 Certified Health & Productivity Outstanding Organizations under the Ministry of Economy, Trade and Industry's program* to recognize companies with outstanding health and productivity management * The top 500 companies among those recognized as companies with outstanding health and productivity management are named among the 500 Certified Health & Productivity Outstanding Organizations.	Certified as a company with outstanding health and productivity management but not named among the 500 Certified Health & Productivity Outstanding Organizations	Same as at left Promoted the development of systems and human resource development in light of legal compliance and risk management as the bases of industrial health
	Thorough corporate ethics	Provide Group employees with a total of 1.5 hours of training on corporate ethics and human rights per employee per year on an ongoing basis	Achieved the target training hours per employee in Japan (Corporate Ethics Month and human rights education)	Same as at left
	Protection of intellectual property	Achieve the target of new applications: from 342 in 2018 to 405 in 2022, and to 460 in 2025	More than 350 new applications	Same as at left
	Decision-making process and structure	Continue to evaluate the effectiveness of the Board of Directors and disclose information about improvements made based on the results	Disclosed internal effectiveness evaluation in Corporate Governance Report and Integrated Report	Same as at left Note: For details in 2020, see "Corporate Governance" on page 62.

Measures against Climate Change (Disclosure in Line with TCFD)

Basic ideas and policies

Although it does use fossil raw materials and fuels in its product manufacturing processes and emits a considerable amount of greenhouse gases (GHGs), the Showa Denko Group has many products contributing to energy conservation and the carbon cycle. We regard measures against climate change as a management priority in terms of both risks and opportunities.

In May 2019, we took part in the Task Force on Climate-related Financial Disclosures (TCFD) Consortium to evaluate the risks and opportunities provided by climate change to the Group, enhance our resilience through climate change scenario analysis and promote sound dialogue with our stakeholders.

Governance and risk management

At the Showa Denko Group, the Sustainability Promotion Council, which is chaired by an officer in charge of CSR, makes assumptions about climate change-related risks and opportunities, and the Management Committee discusses those risks and opportunities. Details of the decisions made by the Committee are regularly reported to the Board of Directors.

A cross-organizational working group on TCFD is established under the Sustainability Promotion Council to identify risks and opportunities based on the scenarios analyzed according to the framework of TCFD.

Meanwhile, a special working group on risk management (Risk Management Working Group) is also managing climate change-related risks with a company-wide risk evaluation system ("risk inventory" activity).

Strategy and scenario analysis

For impacts (risks and opportunities) of climate change on the Showa Denko Group's businesses, we assumed the following risks for 2050 based on the framework set by the TCFD and in light of the integration with Showa Denko Materials: (1) risks related to a shift to a low-carbon economy under the 1.5- and 2-degree scenarios, and (2) risks related to the physical impact of climate change caused by the failure to achieve the world's CO₂ emission reduction targets under the 4-degree scenario.

Possible shift-related risks that may have company-wide impacts include an increase in operating costs due to rise in carbon pricing and other energy taxes. GHG emissions after 2023, when Showa Denko and Showa Denko Materials integrate, would be about 4.5 million tons/year. If GHG emissions in 2030 are constant and carbon pricing is ¥10,000/t-CO₂ based on the IEA's*1 2-degree scenario

(SDS)*2, the amount that the entire Showa Denko Group should pay will increase by ¥45 billion/year. If the Group achieves a 30% reduction in emissions relative to the 2013 level by 2030, the Group should pay about ¥35 billion/year, meaning the cost increase due to carbon pricing would be restrained (see "Feature Story 1: Challenges to Realize Carbon Neutrality" on page 32).

Meanwhile, physical risks that have an impact on the entire company include increasing flood risk at manufacturing sites due to frequent flooding. In 2020, Showa Denko Materials analyzed physical risks at its plants. The analysis results will be integrated into a new risk management system, which is under discussion, for continued management.

The Showa Denko Group assumes that climate change will have a tremendous impact on the following business domains: (1) transportation, (2) information and communication, (3) energy and (4) construction and infrastructure. In 2020, as we did in the previous year, we reviewed the impact of climate change in the transportation domain in light of the integration with Showa Denko Materials.

Under the 1.5- and 2-degree scenarios, our operating cost will increase due to the introduction of ICP*3. However, business opportunities will also expand, driven by the need for energy conservation and the spread of electric vehicles (EVs) and fuel cell vehicles, which will boost demand for the related components. Therefore, we have concluded that we have sufficient resilience against the climate change-related risks in the transportation domain. We will incorporate the examined matters into our strategy for our mobility business, which is positioned as a Core Growth business in our long-term vision. We will conduct scenario analysis on other business domains as well in a phased manner.

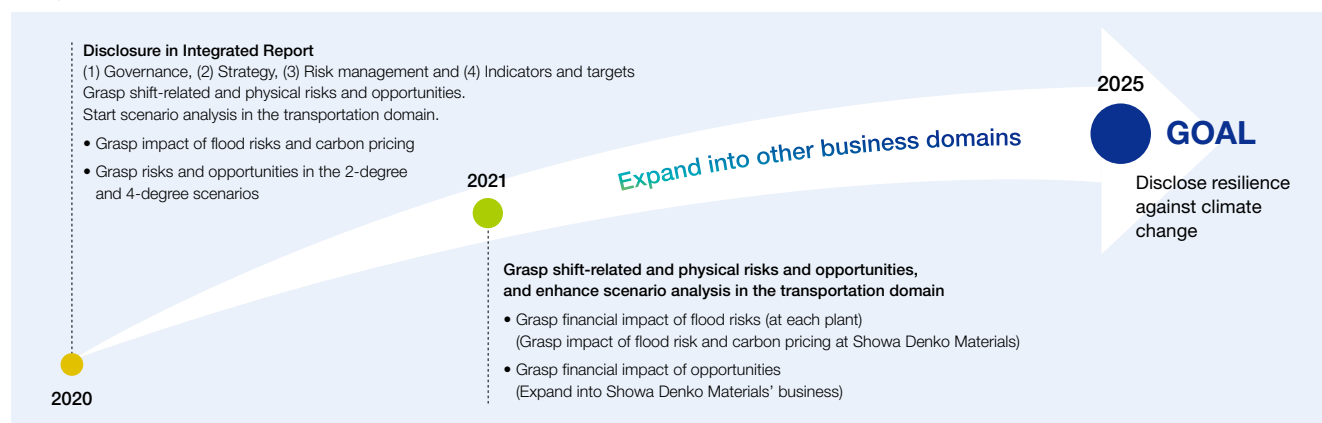
*1 IEA: International Energy Agency

*2 2-degree scenario: Sustainable development scenario

*3 ICP: Internal carbon pricing

TCFD disclosure (scenario analysis) procedure

A plan to review priorities in response to the Green Growth Strategy and analyze the information and communication domain after doing the transportation domain



Climate change-related risks and opportunities and major responses to them

For risks and opportunities in the transportation domain, we reviewed the 2-degree scenario implemented in 2020 and conducted analysis by adding the 1.5-degree scenario.

Impact of climate change on our company	Domain	Risk	Opportunity	Response
Risks and opportunities related to the shift to a low-carbon economy (1.5- and 2-degree scenarios)	All business domains	○		Improving/rebuilding internal systems based on LCA results and knowledge
		○		- Energy conservation and equipment renewal at manufacturing sites - Increasing the introduction of renewable energy
		○		- Use of hydroelectric power generation facilities - Considering procurement of renewable energy from outside
		○	○	Initiatives for plastic chemical recycling and iron recycling (graphite electrodes)
		○	○	- Maximizing synergies of the integration of Showa Denko and Showa Denko Materials - Promotion of R&D at the stage of integration (new research laboratory)
		○		Review of manufacturing processes and introduction of innovative technologies
		○		Proactive information disclosure and communication in response to the concerns of investors and the market
		○	○	Sales promotion and development of new products that meet the needs of a low-carbon economy, and enhancement of product competitiveness
	Transportation domain		○	
		○	○	Maximizing synergies of the integration of Showa Denko and Showa Denko Materials
		○	○	
			○	
Physical risks and opportunities (4-degree scenario)	All business domains	○		- Analysis of flood risks at each site - Regular risk identification and reduction activities, and enhancement of business continuity planning (BCP)

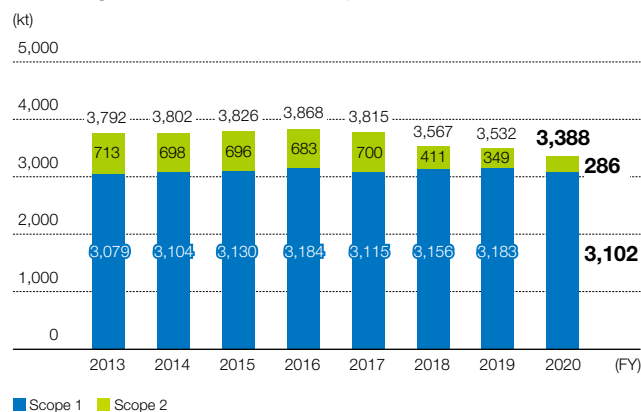
Indicators and targets

In light of the integration with Showa Denko Materials, we reviewed the GHG emission reduction targets for 2030 in 2021 and set the target of a 30% reduction relative to the 2013 level. We will review the medium- to long-term plans made for each of our sites toward the creation of a low-carbon economy and set the medium-term targets for our overseas Group companies. In order to achieve our GHG emission reduction targets for 2030, we will further reduce our GHG emissions and promote energy conservation.



For details, see **"Feature Story 1: Challenges to Realize Carbon Neutrality"** on page 32.

GHG emissions (Showa Denko and Group companies in Japan; excluding Showa Denko Materials)



Reference: Showa Denko Materials (unconsolidated) results in 2020: 224 kt

Note: Emission amounts were calculated in line with the GHG Protocol.

The annual data are shown for the period from April 1 of the year to March 31 of the next year.

Responsible Care (Quality Assurance, Chemicals Management, Health and Safety, Environmental Preservation)

Ideas about responsible care

Responsible care is a voluntary management activity through which businesses that handle chemical substances improve the life cycle of those chemical substances, considering health, safety and the environment throughout the stages from development and manufacturing to distribution, use, final consumption and disposal.

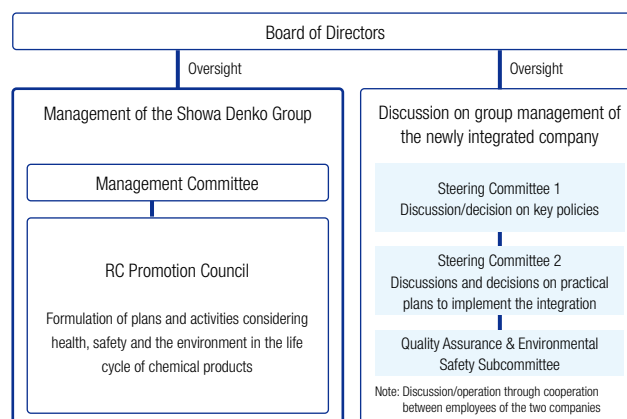
We promote activities based on the Responsible Care Action Guidelines to fulfill our responsibility as a chemical manufacturer and contribute to a sustainable global society.

At Showa Denko, the Responsible Care (RC) Promotion Council is placed under the Management Committee. Results of deliberation at the RC Promotion Council are reported to the Management Committee for discussion, and the results of that discussion are then reported to the Board of Directors.

Regarding the responsible care policy of the new company integrating Showa Denko and Showa Denko Materials, employees from the two companies are examining a system and measures to achieve “the ideal.”

We work to make continuous improvement in our responsible care activities through the plan-do-check-act (PDCA) cycle of formulating responsible care activity plans (plan), implementing these (do), auditing and evaluating the results (check), and reflecting these via management review in the next round of objectives and activity plans (act).

Responsible care promotion system



Quality assurance

Ideas about quality assurance

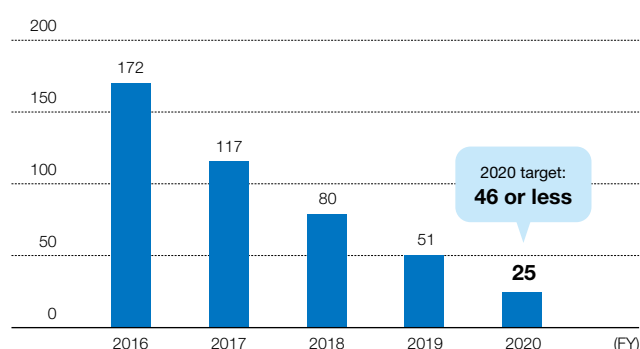
We will ensure the safety and security of products and services to provide world-class quality. We will integrate the two companies' important measures for product safety, quality management, product compliance, handling of complaints and product incidents as well as for quality education for employees.

Having no differences in the basic approach to quality, the two companies will envisage ideal quality activities through the integration project to achieve the ideals.

Aiming to provide value exceeding the expectations of stakeholders, including customers, we will ensure product quality through concerted efforts across the company and establish quality-related policies, systems and mechanisms for the newly integrated company.

Quality complaints

Showa Denko and Group companies in Japan (excluding Showa Denko Materials)
(Complaints)



Chemicals management

Ideas about chemicals management

We are identifying and reducing risks in consideration of various product-related situations in the product cycle from product design and development to manufacturing, sales and after-sale service, including checking the safety of chemicals and how customers use and dispose of or recycle products. Believing that minimizing chemical risks will improve product value, we regard chemicals management as one of our key themes and take actions accordingly.

Based on the risk-based ideas, we will make efforts for the proper evaluation and management of chemical risks and provision of information to stakeholders while ensuring legal compliance so that customers can use our products with ease.

Health and safety

Ideas about health and safety

To ensure workplace safety for all people working at the Showa Denko Group as well as equipment safety, we provide group-wide safety education and carry out activities for risk evaluation and reduction.

We will also build an appropriate industrial health and safety system and implement measures to help individual employees be aware of their health and promote their own physical and mental health.

Lost-time and non-lost-time incidents

Showa Denko and Group companies, and partner companies in Japan (excluding Showa Denko Materials)

2020 target:
0 lost-time/non-lost-time incidents

	2016	2017	2018	2019	2020
Lost-time incidents	3	7	4	15	3
Non-lost-time incidents	5	1	5	4	8

Reference: Showa Denko Materials (unconsolidated) and Group companies in Japan
Results in 2020: 1 lost-time incident, 18 non-lost-time incidents

Indicators of employees' health

In 2020 (2019 results in parentheses)

	% of employees who received health checkups	% of healthy BMIs (18.5–25) found by health checkups	% of employees who took stress checks
Showa Denko and Group companies in Japan	100% (100%)	63.3% (64.1%)	92.0% (96.5%)
Showa Denko Materials and Group companies in Japan	100% (100%)	56.5%	97.0% (92.6%)

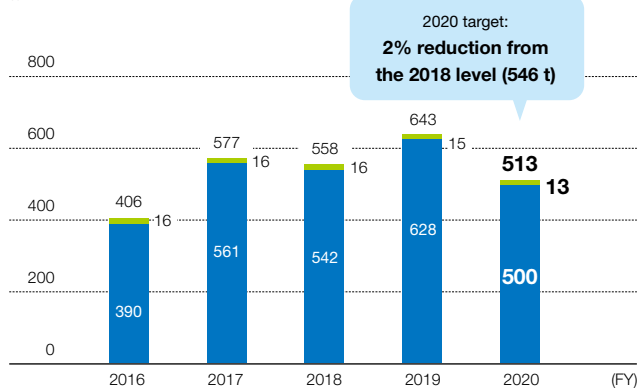
Environmental preservation

Ideas about environmental preservation

To gain trust from all stakeholders, we not only ensure compliance related to the environment but also focus on specific environmental preservation activities, including in the areas of energy saving, reducing greenhouse gas (GHG) emissions, reducing and recycling industrial waste, water resource management, and biodiversity.

Discharge of chemical substances (substances regulated by the PRTR of the Japan Chemical Industry Association)

Showa Denko and Group companies in Japan (excluding Showa Denko Materials)
(t)



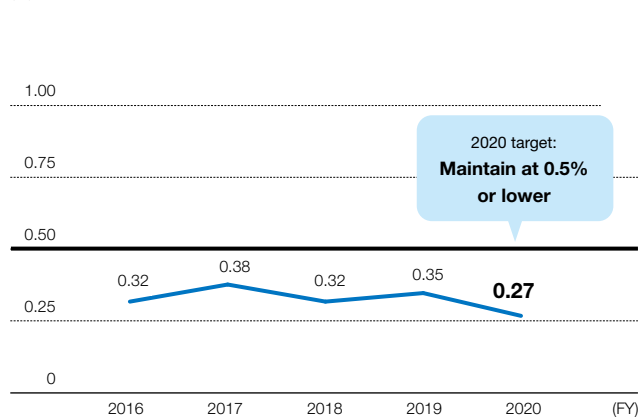
■ Into air ■ Into water

Reference: Showa Denko Materials (unconsolidated) results in 2020: 28 t

Note: The annual data are shown for the period from April 1 of the year to March 31 of the next year.

Final landfill rate of industrial waste

Showa Denko and Group companies in Japan (excluding Showa Denko Materials)
(%)



— Landfill rate of the Group — Zero-emissions benchmark (based on Showa Denko's criteria)

Reference: Showa Denko Materials (unconsolidated) results in 2020: 0.05%

Note: The annual data are shown for the period from April 1 of the year to March 31 of the next year.

Minamata disease in Niigata Prefecture

With regard to Niigata Minamata disease, which was officially recognized in 1965, we maintain an awareness of the significant scale at which substances emitted by Showa Denko have caused damage to the victims and residents of neighboring areas through contamination of the Agano River, and are committed to collaborating with the Japanese government as well as local governments in order to cope with this issue with sincerity, and provide solutions in accordance with the Act on Compensation, etc. for Pollution-related Health Damage and other relevant laws and regulations.

Human Resource Development and Diversity & Inclusion

Ideas about human resources

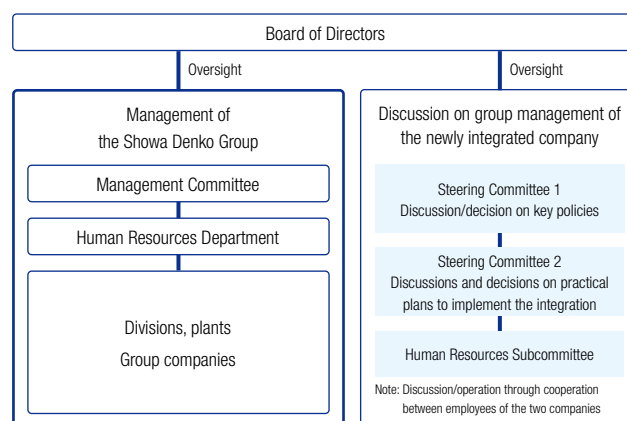
Employees are core players for all the value creation related to the Showa Denko Group. With the purpose of “change society through the power of chemistry,” the newly integrated company will aim to be an employer that chooses, and is chosen by, employees who can compete on the global stage and contribute to a sustainable global society.

More specifically, with the goal of establishing a virtuous cycle in which the company and employees can develop together, the new company will provide opportunities as well as employment conditions and mechanisms around the four axes below while employees will improve their own value and play active roles:

- (1) Select and promote employees who can compete on the global stage
- (2) Encourage healthy competition with appropriate treatment according to contribution
- (3) Make decisions promptly by establishing a lean organization* and clarifying responsibilities and authorities
- (4) Promote penetration of the Showa Denko Group's values and spirit of challenge

* Lean organization: Organization that is muscular and has no waste

Promotion system



Human resources development and labor standards

Ideas about human resource development and labor standards

We are building mechanisms for human resource development and labor standards that are unified between Showa Denko and Showa Denko Materials, with a view to introducing them in 2023.

What we keep in mind in building the mechanisms is the aim to embody the aforementioned ideas about human resources to the fullest extent possible by using the best practices around the treatment of employees of the two companies. Particularly in terms of human resource development, we will rebuild conventional level-specific training and selective training measures, possibly from scratch. We are also examining an evaluation mechanism with a focus on human resource development.

As for a system that supports the above, we are considering the introduction of a mechanism that allows for effective operation with digital transformation (DX).

Matters related to human resources and labor standards to be set by the newly integrated company

- Employment
- Grading
- Evaluation
- Rewards
- Development
- Assignment

TOPICS

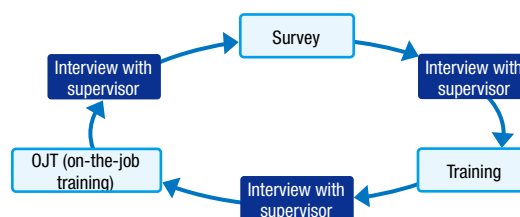
Development of next-generation leaders and leadership competency

Showa Denko provides selective training courses to develop individual employees who may be future candidates for senior management positions, with a major focus on the development of MBA elements and leadership competency*.

For the competency development, we started to use online programs in 2021 to increase the number of employees who can participate around the globe.

We will expand the scope of application of competency development to leaders other than those selected, while providing more effective leadership development programs to those who are selected.

* Competency: Possession of behavioral characteristics that allow one to demonstrate outstanding results in one's work or role



Cycle for competency education

1. Identify competency to be developed

- Survey
- Evaluating demonstration/ importance of competency
- Interview with a supervisor
- Identifying competency to be developed

2. Formulate a plan to acquire and practice necessary knowledge

- Taking competency training course
- Interview with a supervisor
- Agreeing on a plan, support and how to check progress

3. Put into practice the knowledge acquired at work, and review actions

- OJT (at workplaces)
- Implementing the plan formulated in 2
- Interview with a supervisor
- Review of the results

Promotion of diversity and inclusion

Ideas about diversity and inclusion

Diversity and inclusion is an important theme in integrating the formerly two separate companies of Showa Denko and Showa Denko Materials, and can be a precondition for value creation.

We will implement various measures so that members of the diverse* workforces of the two companies can make use of their unique features, value and ideas and collaborate to make the Group and its employees an organization and individuals, respectively, that can continue making profit and creating new value.

* Diverse: Diversity in nationality, race, gender, age, disability, religion, background, sexual orientation and other

Employee awareness survey

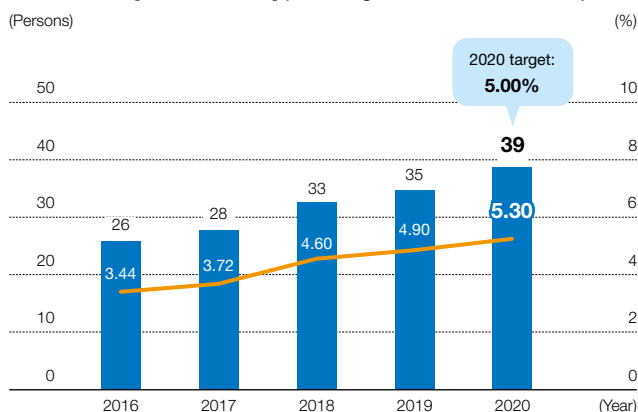
To quantitatively understand the situations of individual people and the organization, Showa Denko and Showa Denko Materials have regularly conducted employee awareness surveys and improved the organizational culture based on the survey results.

In 2021, with a view to promoting organizational reform for the development of satisfying workplaces and future growth, the two companies will conduct a common employee survey for the following purposes:

- (1) To assess the situation of employee engagement and the work-place environment (whether or not it allows employees to fulfill their potential) at the Showa Denko Group.
- (2) To use survey results as a basic reference in examining what future management should look like to make the organization more productive.
- (3) To reveal the frank views and opinions of employees regarding the management integration.

Number of female managers and its ratio

Showa Denko [unconsolidated] (excluding Showa Denko Materials)



■ Number of female managers — Proportion of female managers

Reference: Showa Denko Materials (unconsolidated) results in 2020: 4.2%

Empowerment of a diverse workforce

Showa Denko has proactively hired more women in order to increase the proportion of women among career-track employees to 30% or more, and has regularly held career support seminars for mid-level career-track female employees. We have also improved the work environment to enable female employees to balance work and life events, such as marriage, childbirth and childcare.

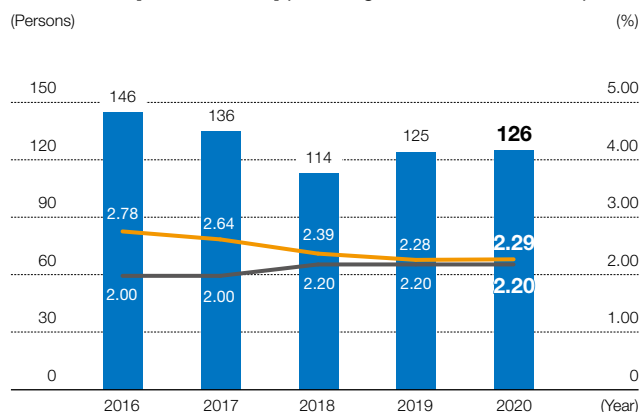
Showa Denko Materials has also made efforts to build pipelines for a stronger female workforce, including individual development plans for career-track female employees and the dispatch of female candidates for leadership positions to the J-Win NPO. Additionally, the company has provided unconscious bias workshops to develop a work environment where members of diverse teams can make meaningful contributions.

Meanwhile, the two companies are proactively employing people with physical, intellectual, mental and developmental disorders toward the goal of disability inclusion. Having agreed on "The Valuable 500" in September 2020, Showa Denko announced its commitment to developing an inclusive working environment where individual employees with disabilities or medical conditions can make a meaningful contribution and live an enriched life as members of society.



Number of employees with disabilities and its ratio

Showa Denko [unconsolidated] (excluding Showa Denko Materials)



■ Number of employees with disabilities — Employment rate of people with disabilities

— Legal requirement

Reference: Showa Denko Materials (unconsolidated) results in 2020: 2.27%, 117 people

Promotion of Sustainable Procurement

Toward sustainable procurement

Ideas about sustainable procurement

The Showa Denko Group is engaged in procurement activities based on the Basic Procurement Policy with the aim of carrying out socially and environmentally friendly business activities throughout its supply chain, from the procurement of raw materials to manufacturing, sales and distribution.

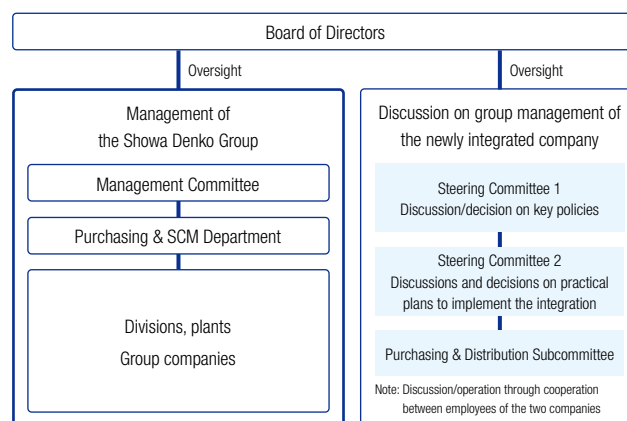
To fulfill its social responsibilities, including for the environment, human rights and compliance, across the supply chain from a global perspective, the Group has established the Showa Denko Group's CSR Procurement Guidelines, which cover issues for which the Group requests cooperation from its suppliers, with the aim of ensuring compliance through working together to mutually improve our corporate value.

The integration will expand the business of the Group as well as the impact across the entire supply chain. Currently, the Purchasing and Distribution Subcommittee, comprising representatives of both Showa Denko and Showa Denko Materials, is discussing the procurement policies, initiatives and supplier evaluation criteria of the newly integrated company. As of 2021, the two companies are jointly holding important meetings and education programs.

Risk evaluation to promote sustainable procurement

Showa Denko requests all its suppliers to comply with the Showa Denko Group's CSR Procurement Guidelines. To raise suppliers' awareness, we ask new suppliers to fill out the CSR self-assessment questionnaires when starting business with us and major existing suppliers to do so once every three years. Additionally, every year, we visit around 40 suppliers to evaluate them from the perspectives of

Promotion system



the environment, human rights and compliance. We have aggregated the CSR initiatives of the suppliers who have responded to the CSR self-assessment and those who received the CSR visit and sent them feedback reports, which clarified their standing relative to the average of all and of their own business category, and provided advice for making improvements. Considering these as pillars of our efforts to evaluate suppliers' risks, we implement a three-year cycle for supplier risk evaluation for all items and services we purchase, in principle.

Meanwhile, Showa Denko Materials distributes its Supply Chain CSR Procurement Guidelines to new suppliers when starting business with them and asks them to submit a report on the completion of checking as well as conducting supplier audits.

Results of supplier CSR self-assessment in 2020

No. of respondents: **355 companies** Average score: **67.3 (up 1.1% year on year)**

Score	No. of companies (%)	Improvement efforts
50 or over	292 companies (82%)	Requested to work on the matters that need improvement and to further enhance the high-scoring matters
30 to 50	56 companies (16%)	Requested to work on the matters that need improvement and offered Showa Denko's proposal on improvement measures Note: Visit, as needed, to exchange opinions on efforts on both sides and check improvements with the next self-assessment
Below 30	7 companies (2%)	Requested to work on the matters that need improvement and offered Showa Denko's proposal on improvement measures Note: Visit, as needed, to discuss early improvement and check improvements with the next self-assessment

Ideas about conflict minerals

Showa Denko and Showa Denko Materials incorporate the issue of conflict minerals related to inhuman acts by local armed groups in the Democratic Republic of Congo and its neighboring countries in their CSR Procurement Guidelines, and ask their suppliers to provide them with related supply chain information to avoid the purchase and use of these minerals.

We will continue to contribute to the international initiative for responsible minerals sourcing, recognizing the role to be played by the Group.

"White Logistics" movement

"White Logistics" is a movement launched in March 2019 by the Japanese Ministry of Land, Infrastructure, Transport and Tourism,

Ministry of Economy, Trade and Industry, and Ministry of Agriculture, Forestry and Fisheries to improve the work environment of the logistics industry. The purpose of this movement is to increase the productivity of truck transportation, enhance the efficiency of logistics operations and create better "white" workplaces where women and people aged 60 and older can also work in comfort.

White Logistics can almost be considered a work style reform movement in the logistics industry, and it is important for shippers to ensure compliance to contribute to the reform. In support of the movement, Showa Denko and Showa Denko Materials have made a declaration to voluntarily take actions for sustainable logistics and have been acting in accordance with the declaration.

Respect for Human Rights / Initiatives on COVID-19

Respect for human rights

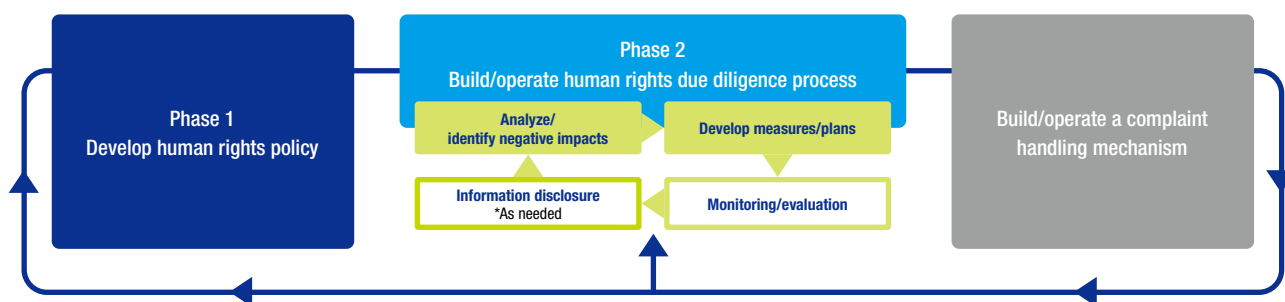
Ideas about respect for human rights

In order for the Showa Denko Group as an entity contributing to a sustainable global society to satisfy all stakeholders, we must understand the relationship between our business and human rights issues and promote activities that promote respect for human rights while taking appropriate actions considering all possible risks of human rights violations.

By the end of 2021, we will show the newly integrated company's basic approach to human rights in line with the Ten Principles of the

Global Compact and the Guiding Principles on Business and Human Rights (Ruggie Principles) of the United Nations. We will not only ask all Group employees, including those working outside Japan, to abide by the rules but will also ask all our business partners, including suppliers, to incorporate the ideas.

Meanwhile, we will also establish a framework for human rights due diligence by the end of 2021 to make it effective.



Initiatives on COVID-19

Ideas about initiatives on COVID-19

The Showa Denko Group is taking initiatives for COVID-19 in its life science business while making various efforts to respond to risks and for business continuity.

The Group CEO shared a message promising employees that the Group will: (1) give first priority to protecting the health of all Group

employees and employees of partner companies; (2) continue to supply the products that are indispensable for society and daily life as its social responsibility; and (3) make preparations to achieve further growth for the Group after the pandemic ends. We are dealing with the coronavirus crisis also in line with the BCPs.

Initiatives through business

Launch of joint research with the National Cancer Center Japan on the development of rapid cell-mediated immunity tests

Signed a joint research agreement with the National Cancer Center Japan on the development of rapid cell-mediated immunity tests for COVID-19 in March 2021 and started the joint research in April.

Release of diagnostic products that help determine infection with COVID-19

Released COVID-19-related diagnostic products* (AccuPlex™ series for genetic testing and ACCURUN® and AccuSet™ series for antibody testing)
* Manufactured by U.S.-based SeraCare Life Sciences

Donation of protective gear to hospitals overwhelmed by the COVID-19 pandemic

Donated protective clothing and surgical masks to medical frontlines via the Japan Business Federation in response to the frontline shortage of medical supplies.

Initiatives for responding to risks and business continuity

- Introducing teleworking at major plants and departments. The head office, in particular, has continued to minimize the percentage of employees who work in the office (to around 20%) by drastically reviewing its operations.
- Implementing, in a timely and appropriate manner, measures that prioritize securing employees' safety and preventing the spread of infection, including providing special leave when there is a concern about infection and asking employees to voluntarily refrain from group dining.
- Making efforts to maintain production activities while taking thorough measures to prevent infection. Focusing on maintaining social infrastructure functions, including maintaining the supply of products to customers.
- The COVID-19 Headquarters is collecting information in and outside Japan, and is regularly raising employee awareness and providing instructions for preventing the spread of infection.

Risk Management

Risk management

Ideas about risk management

Upholding “deepening of risk management on the basis of safety and compliance” as the main theme, the Showa Denko Group is striving to improve its risk control for both ordinary times and emergencies and to reduce the detected risks.

To take actions before a risk occurs, we must build a mechanism to manage and analyze risk-related information in an intensive and integrated manner and another mechanism for the effective and efficient escalation of important information that supports the top management team in making decisions on business strategy, resource allocation and so on.

Currently, the Risk Management Subcommittee, comprising staff in charge from Showa Denko and Showa Denko Materials, is working on higher-level standardization, including common tools.

Implementation of risk assessment

Showa Denko has established an ISO 31000-compliant risk assessment, response and review process.

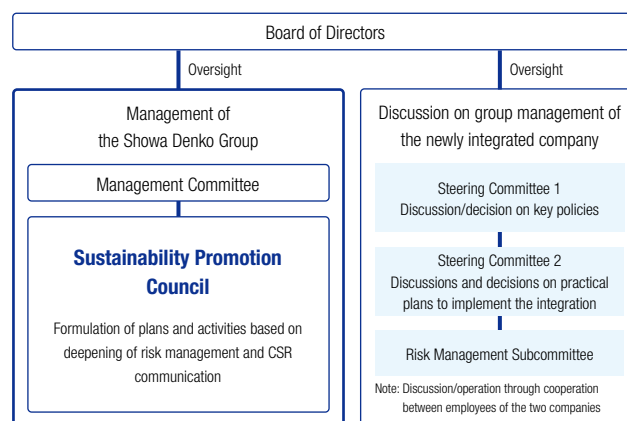
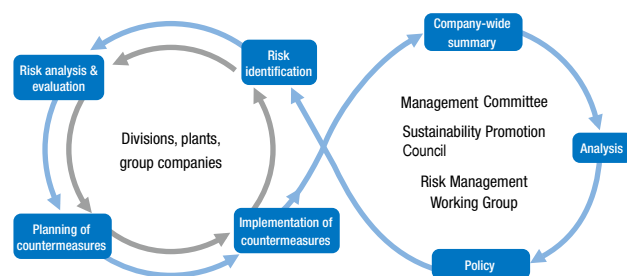
Once a year, the comprehensive identification of risks, including potential risks associated with business activities, and evaluation of risks (risk inventory) are conducted at more than 140 frontline organizations, such as sections and groups.

Results of the risk inventory activity are reviewed, at the site level, by the top leadership of a division, plant or group company. For serious risks identified, discussion at a company-wide meeting (Sustainability Promotion Council) takes place as to the direction and appropriateness of risk countermeasures. Results of the discussion are then reported to the Management Committee and the Board of Directors. The Sustainability Promotion Council discusses not only serious risks but also important agendas of the entire company.

In 2020, risk managers and risk submanagers were appointed to each site to further enhance and standardize the risk management promotion system.

Meanwhile, Showa Denko Materials has established the Risk Countermeasures Procedure to identify risks that the company

Promotion system



should address and to declare that its officers and employees have roles related to preventing risks from occurring. In cases of emergencies, the procedure also clarifies criteria for setting up the risk response headquarters as well as its members and activities, and criteria for communications. Particularly with regard to risks that may have a critical impact on management, the company identifies the type of risk, department in charge of responding, scale of damage and frequency of occurrence, and evaluates the impact on management and reports to the Management Committee.

Risk classification

(1) Accidents and disasters	Facility accidents, fires and explosions, injuries or deaths, environmental accidents, natural disasters and climate change, infrastructural accidents, traffic and distribution accidents, chemical handling accidents, accidents involving products
(2) Risks related to violation of laws, antisocial acts	Violation of industrial property rights, violation of antitrust laws, insider trading, violation of foreign exchange law, violation of subcontract law, violations of laws concerning environment, chemical substances, security and safety, defamation, violation of privacy, crimes committed by employees, bribery
(3) Risks related to human resources and labor	Outflow and security of human resources, evaluation, rewards and assignment, infectious diseases, work hours, diversity of employment patterns, involvement as victim of crimes and terrorist acts
(4) Information management	Information leaks, system failures, problems involving media, rumors, whistle blowing, commercial software, management of login ID
(5) Risks related to management and business	Stocks and corporate bonds, investments, finance and accounting
(6) Risks related to supply chains	Inventory, assets, procurement, business
(7) Risks related to external environment	Nation, region, community, industry

Note: Evaluate from the perspectives of loss of social credibility, loss of human resources, and loss of financial assets

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Enhancement of business continuity plans (BCPs)

Ideas about BCPs

Showa Denko has been making BCPs based on the idea that we need to build a business system that is highly resistant to disasters and other crises both in Japan and overseas. We make specific BCPs in consideration of the features of each of our businesses and products, put in place measures and systems for our equipment oriented to disaster prevention and reduction, enhance stockpiling plans for possible disasters, and clarify and work on problems through the aforementioned continued and regular risk assessment (risk inventory activity). We are thereby managing our business in a manner that enables us to continue it while giving first priority to people's lives. Moreover, we regularly conduct drills to foster collaboration for BCPs between the divisions, plants and affiliated companies, through which participants can share the lessons learned, problems and best practices and incorporate them into the BCPs.

Showa Denko Materials has also developed—and annually improves—BCPs for large earthquakes and pandemics based on its common group policy, while also conducting simulation drills based on the assumptions of the BCPs. Issues recognized through the drills are reported to the Management Committee to be shared among corporate officers and other top-level executives to improve the following year's BCPs.

With a view to integrating their head offices, the two companies will review the head office emergency response headquarters in Shibadaimon and Marunouchi as well as local emergency response headquarters, which would respond to an inland earthquake hitting the Tokyo metropolitan area, and discuss how to operate the headquarters on a remote basis in light of the increase in teleworking, with the goal of making the crisis management system more effective.

Corporate ethics and compliance

Ideas about corporate ethics and compliance

The Showa Denko Group believes that corporate ethics and compliance provide the basis of its business continuity and are essential for the achievement of its vision. Accordingly, we comply with laws and regulations and the social norms of each country and region. In addition, we are implementing a system and conducting a range of activities to instill ethical values based on honesty, impartiality and integrity.

With the January 2023 integration of the legal entities of Showa Denko and Showa Denko Materials serving as a milestone, we are conducting examinations to determine an ideal system for the new company and its operations so that we can establish awareness of corporate ethics and compliance among all Group employees in and outside Japan and properly monitor compliance.

Thorough corporate ethics and compliance

Showa Denko and Showa Denko Materials mark Corporate Ethics Month annually, sharing the Group CEO's message in multiple languages with all employees in and outside Japan. The two companies also provide individual employees with opportunities to check their practice of corporate ethics and compliance, such as by reading through the Code of Conduct and engaging in workplace discussions.

To prevent corruption, Showa Denko has formulated the Showa Denko Group's Global Anti-Bribery Policy to ensure compliance with anti-corruption laws and regulations enforced in each country. As for compliance with antimonopoly laws and regulations in each country, we manage anti-cartel rules, raise awareness of guidelines, regularly provide training taught by outside experts, carry out voluntarily audits every year to check for illegal sales activities within the Group, and report the audit results to the management team.

Meanwhile, Showa Denko Materials has introduced a global compliance program and is taking actions regarding compliance with

antimonopoly laws, prevention of bribery and prevention of transactions with antisocial forces as keys to compliance management.

Initiatives for compliance with antimonopoly laws include operation of the Compliance Information Notebook to record even minor cases of possible legal infringement, such as contacting a competitor, at Group companies in and outside Japan. Departments in charge of compliance audit the records semiannually. In fiscal 2020, the audit was conducted only once due to the COVID-19 pandemic. It was confirmed that there were no problems.

As for anti-corruption, we prohibit all employees from engaging in bribery and set forth guidelines that ask them to take specific actions to prevent, detect and respond to bribery.

System for consultation and reporting on corporate ethics and compliance

Showa Denko and Showa Denko Materials have set up compliance hotlines that are available to all stakeholders wishing to seek consultation or report any issues regarding compliance. The two companies, moreover, make proper and prompt responses to such reports with due consideration to confidentiality and the prevention of disadvantageous treatment of hotline users.

Reports are received internally or at external contact points. After discussion with the company or site named in a report, a department in charge of compliance will conduct a fact-checking exercise and investigation. If an illegal act is found, corrective measures will swiftly be taken. As for serious cases, all matters, from reporting to investigation to corrective and preventive measures, are reported to the Management Committee and the Board of Directors.

In 2020, Showa Denko and Showa Denko Materials received 54 and 81 reports (including requests for consultation), respectively, and properly responded to the cases through cooperation with related departments. There were no cases of serious compliance violations.

Corporate Governance

Basic policies

Showa Denko K.K. works to increase its corporate value and expand profit for both the company and its shareholders by collaborating appropriately with stakeholders including shareholders in line with its Corporate Governance Basic Policies.

We are committed to promoting our corporate governance to ensure the soundness, effectiveness and transparency of management and to continue enhancing our corporate value, thereby earning more trust and receiving a higher rating from society. We describe our efforts made to this end in our corporate governance report, while also fostering constructive dialogue with investors and shareholders.

As a new corporate group established through the integration of Showa Denko and Showa Denko Materials, we will make further efforts to enhance and advance our corporate governance.

Looking back on fiscal 2020

In 2020, Showa Denko implemented its largest ever M&A project to make Showa Denko Materials a consolidated subsidiary by acquiring its shares through a takeover bid. Toward full integration as a corporate entity in 2023, we will enhance our measures to ensure and further advance our governance.

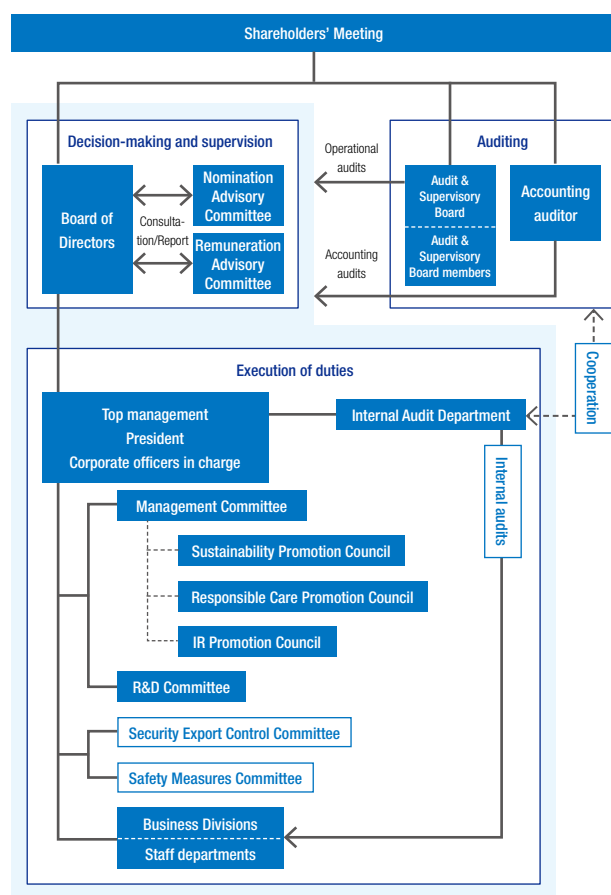
In order to enhance governance across our business areas, which are expanding due to the integration, President Maruyama of Showa Denko Materials joined Showa Denko's Board of Directors as an inside director in March 2021, and as a result the Board is now composed of 10 directors.

For the integration of Showa Denko Materials, a project team comprising members from the two companies is conducting activities, and progress with the activities is appropriately reported to the Board of Directors.



For details, please see “Corporate governance for integrated company” on pages 10 and 11.

Corporate governance structure (As of June 30, 2021)



Governing body	Members	Chairperson	Meeting frequency
Board of Directors	4 outside directors (One is female) 6 inside directors	Inside director not in charge of business execution	Once or twice a month
Audit & Supervisory Board	3 outside auditors (Two are female) 2 inside (full-time) auditors	Inside full-time auditor	Once or twice a month
Nominating and Remuneration Advisory Committee	4 outside directors (One is female) 2 inside directors	Outside director	3 or 4 times a year
Remuneration Advisory Committee	2 outside directors (One is female) 1 outside auditor 2 inside directors	Outside director	3 or 4 times a year
Management Committee	President, corporate officers in charge, and other corporate officers and heads of the staff departments whose presence on the committee is deemed necessary by the president	President	Once a week in principle

Cross-shareholding policy and method to check the appropriateness of cross-shareholding

Every year, the Board of Directors examines the economic rationality of cross-shareholding from medium- to long-term viewpoints and whether each crossholding helps maintain and enhance the business relationships between the companies with a view to reducing the crossholding of shares that will not contribute to increasing Showa Denko's corporate value on a medium- to long-term basis.

At its meeting held in November 2020, the Board examined the appropriateness of each crossholding based on the results of evaluating its contribution to the company's profitability and business promotion. According to the examination results, we are now in the process of selling some of the shares.

Selection and dismissal of senior management and nomination of candidates for director and auditor positions

Showa Denko selects candidates to be its directors based on the criteria for knowledge, insight, fair judgment, ability to take actions, practical experience and others required of directors. For the selection of senior management, individual performance as well as corporate performance are also taken into consideration. Candidate Audit & Supervisory Board members must possess sufficient knowledge, experience and capabilities to fulfill their obligations as auditors, including an appropriate level of expertise in the areas of finance and accounting.

The Nomination Advisory Committee deliberates the nomination of candidates for the aforementioned positions and submits

recommendations to the Board of Directors. The Committee is an advisory board to the Board of Directors, and more than half of its members are independent outside directors.

Dismissal of the chief executive officer and others

In the event it is revealed that any of the directors, including the chief executive officer, has substantially damaged the corporate value or does not meet the selection criteria for directors, the Nomination Advisory Committee shall discuss whether the person is still suitable for the position and report the results to the Board of Directors, which will make the final decision.

Remuneration of directors and corporate officers

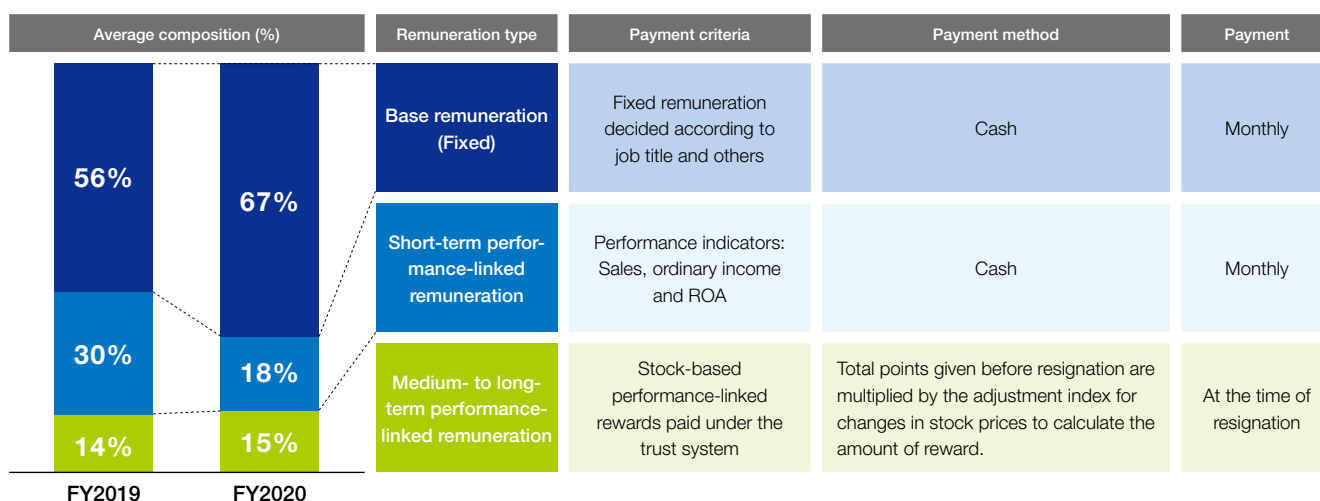
Policies on and breakdown of the remuneration

The remuneration of directors (excluding outside directors) and corporate officers shall be composed of base remuneration, short-term performance-linked remuneration, and medium- to long-term performance-linked remuneration. The base remuneration shall be decided according to the job title and others, while the short-term performance-linked remuneration shall be determined in consideration of corporate and individual performance and others under the performance evaluation system. The medium- to long-term performance-linked remuneration shall be paid under the trust system, in line with the stock ownership rules set for directors. Outside directors and Audit & Supervisory Board members shall only be paid the base

remuneration (fixed amount) on a monthly basis. The standard amount of remuneration shall be determined in reference to the standard amounts paid by other companies (in the same industry and same business size) as revealed through surveys conducted by external professional organizations. Toward the future, we will review the management indicators to which the remuneration for directors and corporate officers will be linked to ensure that the management team will be firmly committed to achieving the Group's targets and increasing its corporate value.

 For details, please see "CFO Message" on pages 38 to 41.

Average breakdown of the remuneration of directors (excluding outside directors)



Procedures to decide the amount of remuneration

The upper limit of the total amount of remuneration to be paid to directors and Audit & Supervisory Board members shall be resolved at the general meeting of shareholders. In line with this policy, the Remuneration Advisory Committee, with a majority of members being independent outside directors and outside Audit & Supervisory Board members, shall conduct deliberations about the remuneration of directors and corporate officers, and the Board of Directors shall make the final decision. The amount of remuneration to be paid to Audit & Supervisory Board members shall be determined through discussions at the meetings of the Audit & Supervisory Board.

Corporate Governance

Total amount of remuneration paid to directors and Audit & Supervisory Board members (2020)

Category	Total amount paid (millions of yen)	Total amount paid by remuneration type (millions of yen)			Number of persons to whom payment was made
		Base remuneration	Short-term performance- linked remuneration	Stock-based rewards	
Director	362	258	56	48	11
Outside director	53	53	—	—	4
Audit & Supervisory Board member	96	96	—	—	7
Outside member	35	35	—	—	4

Note: For the stock-based rewards, the amount paid totaled ¥48 million under the stock-based performance-linked reward system for directors, which was approved by a resolution made at the 107th session of the general meeting of shareholders held on March 30, 2016.

Evaluation of the Board of Directors' effectiveness

Basic policies

Showa Denko aims to achieve sustainable corporate growth and to increase its medium- to long-term corporate value. To this end, as its responsibility and role, the Board of Directors is expected to build a system to make decisions in a transparent, fair, prompt and resolute manner and to supervise the management of the system. Showa Denko conducts a questionnaire survey to check the effectiveness of the Board of Directors as a whole, in which directors and Audit & Supervisory Board members conduct a self-evaluation about whether they have fulfilled that responsibility and role. Based on the survey results, issues to be solved are discussed by the Board of Directors.

Showa Denko includes "Decision-making process and structure" in its material issues and regards continuing the evaluation of the Board of Directors' effectiveness and disclosing the results as a KPI for materiality.

Evaluation method

Regarding the effectiveness of the Board of Directors in 2020, we conducted a survey in December 2020 in which the directors and Audit & Supervisory Board members answered questions and made free comments. Subsequently, in January 2021, we interviewed the four outside directors individually.

Then, in March 2021, the Board of Directors held a meeting for all directors and Audit & Supervisory Board members to discuss the self-evaluation results collected from the directors, create a summary of the evaluation results for fiscal 2020, and formulate the action plan for fiscal 2021.

In order to ensure the objectivity of the survey and further increase the effectiveness of the Board of Directors, the survey is conducted and the results are tabulated by an external organization.

Evaluation results

Based on the survey, interview and discussion results, the Board of Directors has confirmed as follows: members who have diverse experience and expertise make the Board highly effective by taking broad views and having diverse values, and proactive and constructive discussions have been conducted, with the Board taking sufficient time to deliberate the items, for which reference materials are distributed and explanations are made in advance of the meetings.

For the effectiveness evaluation results for fiscal 2020, participants in the Board meeting expressed the following opinions when comparing the results with those for fiscal 2019.

- Whereas sufficient discussions have been held regarding the concepts of the long-term vision set toward the integration of Showa Denko Materials, it is also necessary to foster discussions for the optimization of the business portfolio.
- It is important to continue deliberating the important items, such as the establishment and enhancement of the governance and compliance systems, in consideration of a substantial increase in the number of Group companies and further globalization of the businesses.
- Due to the business integration, the number of items included in the Board of Directors' meeting agenda is increasing. In order to secure adequate time to conduct in-depth deliberations on future management strategies, it is necessary to increase the efficiency of the meetings by, for example, reviewing the method used to select items to be included in the agenda.

Moreover, participants in the meeting agreed on the following: In 2021, they will foster in-depth deliberation on management strategies, the governance system and Group management at Board meetings, promote the exchange of opinions on the issues among all directors and corporate officers, and continue implementing measures to further enhance the effectiveness of the meetings in the face of the coronavirus crisis.

(Free comments)

- The diversity of the Board of Directors has steadily been enhanced by the addition of female outside members and by the broadening of viewpoints due to the diverse backgrounds of the Board members.
- Challenges related to the integration of Showa Denko Materials have been appropriately discussed at Board meetings, but more in-depth discussions are needed as we strive to meet these challenges.
- Due to COVID-19, we had to hold Board meetings online. We need to devise more measures to increase the effectiveness of the meetings in consideration of the situation regarding the pandemic.

Message from the Chairman of the Board



Hideo Ichikawa

Chairman of the Board

I will work for the appropriate management of Board meetings so that the Board can fulfill its functions in a sound manner, with its members being able to discuss issues openly and proactively at the meetings.

In line with an increase in the importance of corporate governance, there is a strong requirement for companies to ensure that their Board of Directors will fulfill its functions and supervise the execution of business in a sound and careful manner. As chairman of the Board, I regard it as my mission to serve as a bridge between the Board of Directors (especially outside directors and Audit & Supervisory Board members) and the CEO and other corporate officers.

Specifically, in order for participants in Board meetings to discuss issues openly and proactively, I work to highlight the priority issues for each agenda item and encourage participants, particularly outside members, to express their opinions on the issues from external viewpoints. At the same time, in order to separate the business execution functions from the business monitoring and supervision functions, I work to maintain the independence of the Board and the neutrality of myself and to manage Board meetings from the viewpoint of all our stakeholders, including shareholders.

In 2020, we added one female outside director to the Board of Directors and also invited a female legal professional to join the Audit and Supervisory Board, thereby further increasing the diversity of the Boards. Now the Board of Directors conducts discussions even more proactively with participants expressing a range of opinions at its meetings, including pointing out challenges from viewpoints different from those taken by members of the Management Committee more frequently than before.

Since March 2020, we have been holding Board meetings online due to COVID-19. Although we share visuals and audio in order to conduct the meetings just like those held in person, it is still difficult for participants to pick up nuances of meaning and exchange individually held information. It cannot be denied that online meetings were not very effective at helping participants get a better sense of one another. In response, I made special efforts to create an

atmosphere that encouraged participants, particularly newly appointed outside members, to participate in discussions and to manage the meetings in a manner that would foster the sharing of ideas.

For the launch of the newly integrated company in 2023, I think it is necessary for the two companies to mutually confirm the ideas and targets for the corporate governance systems. Under the Companies Act of Japan, Showa Denko is a “Company with a Board of Company Auditors” and this management style, I believe, is appropriate for its current structure and size. However, for the management of the company after the full integration of Showa Denko Materials, it is necessary to consider the option of becoming a “Company with an Audit and Supervisory Committee” or a “Company with a Nominating Committee, etc.” and compare this option with the current management style to identify their advantages and disadvantages.

It is also important to help members of the Board of Directors (especially outside directors) to understand as early as possible the outline of a wide range of businesses conducted by the newly integrated company, so that they can have constructive discussions at Board meetings based on their understanding of actual operations. To this end, I would like to proactively provide the members with opportunities to visit our sites in addition to promoting desktop discussions on the integration plan.

The business integration is giving us an opportunity to greatly reform our company toward the future of five and 10 years from now. However, it is also a great challenge for us and naturally poses risks. As chairman of the Board, I will continue to do my best to manage Board meetings in a way that helps the Board to function in a sound manner and its members to make constructive recommendations to corporate officers, thereby maintaining the appropriate tensions between the Board and corporate officers so that they can collaborate together to achieve their shared target of maximizing the corporate value.

Message from an Outside Director



Masaharu Oshima

Outside Director of Showa Denko K.K.
Emeritus Professor, The University of Tokyo
Special Professor, Tokyo City University
Project Researcher, Institute for Solid State Physics,
The University of Tokyo

Having frank discussions with a sense of urgency to contribute to increasing corporate value.

Outside directors assume the responsibility of drawing upon their respective fields of expertise to share their thoughts and of monitoring the management of the company from an independent standpoint. I have been serving as outside director of Showa Denko since 2015 and am tasked mainly with two roles.

First, I am tasked with conducting checks in the R&D and technological domains. To fulfill this role, I need to have a grasp of the on-site situations and therefore have visited a total of 30 operation sites belonging to the company both in Japan and abroad over the six years since I assumed the position of outside director. I have exchanged views with young engineers at the sites and have made recommendations to the Board of Directors based on their opinions.

Second, I am tasked with conducting checks with a view to strategically increasing the corporate value on a medium- to long-term basis. As an expert in electronics and chemistry, I express my opinions mainly regarding digitization for higher productivity and environmental measures for greener business operations.

As for the atmosphere of Showa Denko's Board of Directors meetings, discussions are now conducted with a greater sense of urgency as the number of strategically important agenda items has been increasing recently. I feel that the decision-making speed has increased at the meetings, with more opinions also being expressed by inside directors. Moreover, the Board fostered a shift to aggressive business management based on the profits made in the carbon business and the decision to integrate Showa Denko Materials was made promptly.

I believe the decision to integrate the company is the best one for Showa Denko. With the industrial structure changing in such a big way, I think it is riskier to simply maintain the status quo.

For the integration, in addition to Board meeting discussions being conducted with a sense of urgency and in a proactive manner, on-site exchanges have already been made between workers from the two companies. Especially in the R&D and technological domains, employees have been working to generate synergies and have already achieved some results. I learned these reassuring facts by attending some technological presentation meetings held jointly by the two companies. Also, in the fall of 2020 I visited three sites of Showa Denko Materials including a research institute and was impressed with the fact that employees had very positive views about the integration.

For Showa Denko and Showa Denko Materials to achieve sustainable growth as an integrated company, I think it is important to boldly adopt new and innovative ideas, especially from the following four viewpoints: (1) "Diversity & Flexibility" (example: diversity of human resources); (2) "Green" (example: reducing GHG emissions); (3) "Digital" (example: proactive digitization for higher production and R&D efficiency); and (4) "Global" (example: formulation of resilient international strategies in consideration of country risks). Of these, (1) is particularly important, and the two companies need to develop female executives, promote young employees, and embrace change while regarding each other as equal partners.

The mission of outside directors is to increase the corporate value for all stakeholders. I will continue to frankly express my opinions, including criticisms, to top management and corporate officers and will work for the company with a sense of urgency.

Message from an Outside Member of the Audit & Supervisory Board

Kiyomi Saito

Outside member of the Audit & Supervisory Board,
Showa Denko K.K.
President and CEO of JBond Totan Securities Co., Ltd.
Outside director of Kajima Corp.



I will support the growth of Showa Denko by checking for any risks in the road ahead.

Amid a constantly changing social environment, what companies are expected to do to ensure their corporate governance is also greatly changing. These days, companies need to undertake substantial monitoring for any instances of noncompliance in their business management as well as for any risks posed to the soundness of their financial and accounting activities, not only for their present situations but also for their future.

The most important role of outside auditors is to make efforts to identify any signs of such risks to contribute to the growth of the company. In order to fulfill this role, outside auditors are required to express their frank opinions from objective viewpoints.

At Showa Denko, issues discussed in depth by the Management Committee are presented to the Board of Directors for discussion by the members, and risk analyses are also made to the degree required. As an outside member of the Audit & Supervisory Board, what I can do to contribute to the company is to check whether or not the company has fallen victim to “groupthink*.” In relation to this, I think that questions and comments on trivial issues should be asked and made at preliminary briefings held before a meeting of the Board, so that discussions can be conducted from a broader perspective at the meeting. I think there is room for improvement in this regard.

As for the integration of Showa Denko Materials, corporate officers made very persuasive explanations about the need to complement Showa Denko’s existing business portfolio strategy through the integration. Although the integration poses a huge risk to the company, it is necessary to take the risk for discontinuous growth. Toward full integration, steering committee meetings are frequently

held with the participation of the management teams of the two companies, and I highly appreciate their efforts to lead the two companies in the same direction.

In order to foster financial soundness, it would be necessary for the company to further review the business portfolio, and I would like to monitor the progress and check whether or not the process is steadily implemented.

I expect that Showa Denko will make further contributions to a sustainable society. The SDGs were adopted by the United Nations in 2015 as the goals to be achieved by 2030, and the halfway mark will soon be upon us. A chemical manufacturer cannot help having some negative impacts on the environment. However, it is possible for Showa Denko to make use of its technologies to have positive impacts on the creation of a sustainable society. I regard this as the mission of the company. I expect that the company will steadily fulfill this mission, for which corporate governance is essential.

Showa Denko has long been engaged in the plastic recycling business, and this fact convinces me that the company will be able to make unique contributions that others cannot.

* The term “groupthink” refers to the idea that striving for consensus within a group can result in the making and approval of irrational or dangerous decisions, as well as to the mindset that can give rise to such a situation.

Directors

(As of June 30, 2021)

Directors



1 KOHEI MORIKAWA

Frequency of participation in 2020
Board meetings: 14 times in 14 meetings

April 1982	Joined the Company
January 2013	Corporate Officer; General Manager, Electronic Chemicals Division
January 2016	Managing Corporate Officer; Chief Technology Officer (CTO)
March 2016	Director; Managing Corporate Officer; Chief Technology Officer (CTO)
January 2017	Representative Director; President and Chief Executive Officer (CEO) (incumbent)

2 HIDEHITO TAKAHASHI

Frequency of participation in 2020
Board meetings: 14 times in 14 meetings

April 1986	Joined The Mitsubishi Bank, Ltd. (currently MUFG Bank, Ltd.)
February 2002	General Manager, Business Development Department, GE Japan Holding Corporation
October 2004	Asia Pacific President, GE Sensing & Inspection Technologies, GE Japan Holding Corporation
October 2008	President & CEO, Silicones Business, Momentive Performance Materials Japan Inc.
January 2013	President and CEO, GKN Driveline Japan plc
October 2015	Joined the Company, Senior Corporate Fellow, Assistant to President
January 2016	Corporate Officer; General Manager, Corporate Strategy Department
January 2017	Managing Corporate Officer
March 2017	Director; Managing Corporate Officer
July 2017	Director; Managing Corporate Officer, General Manager, Carbon Division
January 2020	Director; Managing Corporate Officer, in charge of Carbon and Ceramics divisions, Coating materials Department, Yokohama and Shiojiri plants, and Corporate Strategy Department; Chief Strategy Officer (CSO)
March 2020	Representative Director; Managing Corporate Officer, in charge of Carbon Division, Ceramics Division, Coating Materials Department, Yokohama Plant, Shiojiri Plant and Corporate Strategy Department; Chief Strategy Officer (CSO) (incumbent)

3 MOTOHIRO TAKEUCHI

Frequency of participation in 2020
Board meetings: 14 times in 14 meetings

April 1983	Joined the Company
January 2013	General Manager, Ceramics Division
January 2015	Corporate Officer; General Manager, Ceramics Division
January 2017	Corporate Officer; General Manager, Corporate Strategy Department
January 2019	Corporate Officer; Chief Financial Officer (CFO)
March 2019	Director; Corporate Officer; General Manager, Finance & Accounting Department; Chief Financial Officer (CFO)
January 2020	Director; Managing Corporate Officer, in charge of Finance & Accounting and Information Systems departments; Chief Financial Officer (CFO)
March 2020	Representative Director; Managing Corporate Officer, in charge of Information Systems and Finance & Accounting departments; Chief Financial Officer (CFO) (incumbent)

4 HIDEO ICHIKAWA

Frequency of participation in 2020

Board meetings: 14 times in 14 meetings

April 1975	Joined the Company
May 2003	General Manager, Corporate Strategy Office of the Company
January 2006	Corporate Officer; General Manager, Corporate Strategy Office
March 2008	Director; Corporate Officer; General Manager, Corporate Strategy Office
September 2008	Director; Corporate Officer; Executive Officer, HD Sector
January 2010	Director; Managing Corporate Officer; Executive Officer, HD Sector
January 2011	Representative Director; President and Chief Executive Officer (CEO)
January 2017	Representative Director; Chairman of the Board
March 2020	Director; Chairman of the Board (incumbent)

5 HISASHI MARUYAMA

Newly appointed

April 1983	Joined Hitachi Chemical Company, Ltd. (currently Showa Denko Materials Co., Ltd.)
April 2011	Executive Officer, Hitachi Chemical Company, Ltd.
April 2015	Vice President and Executive Officer, Hitachi Chemical Company, Ltd.
April 2016	President, Hitachi Chemical Company, Ltd.
June 2020	Representative Director; President, Chief Executive Officer (CEO) and Chief Quality Officer (CQO), Hitachi Chemical Company, Ltd.
January 2021	Representative Director; President and Chief Executive Officer (CEO), Showa Denko Materials Co., Ltd. (incumbent)
March 2021	Director of the Company (incumbent)

6 HIROSHI SAKAI

Frequency of participation in 2020

Board meetings: 11 times in 11 meetings

Note: Frequency after assuming the position

April 1986	Joined the Company
January 2013	Corporate Fellow; General Manager, Technology Development Control Department, HD Division
January 2015	Senior Corporate Fellow; General Manager, Technology Development Control Department, HD Division
January 2015	Senior Corporate Fellow; General Manager, Technology Development Control Department, HD Division
January 2019	Corporate Fellow; General Manager, Technology Development Control Department, Device Solutions Division
January 2020	Corporate Officer, Chief Technology Officer (CTO)
March 2020	Director; Corporate Officer, Chief Technology Officer (CTO)
January 2021	Director; Corporate Officer, in charge of Advanced Battery Materials Division, Institute for Integrated Product Development, and Corporate R&D and Intellectual Property departments; Chief Technology Officer (CTO) (incumbent)

7 MASA HARU OSHIMA

Outside Director

Frequency of participation in 2020

Board meetings: 14 times in 14 meetings

Based on his abundant expertise and experience as a researcher in the field of electronics, has provided useful management advice in the field of R&D since becoming an outside director of Showa Denko. Also, as outside director, supervises the management of the Company's business in anticipation of future technological trends.

April 1974	Joined Nippon Telegraph and Telephone Public Corporation (currently Nippon Telegraph and Telephone Corporation)
November 1995	Professor, Applied Chemistry Department, Graduate School of Engineering, The University of Tokyo
April 2006	Director, Synchrotron Radiation Research Organization, The University of Tokyo
October 2009	Chairman, The Japanese Society for Synchrotron Radiation Research
April 2013	Project Professor, Synchrotron Radiation Research Organization, The University of Tokyo
May 2013	Chairman, The Surface Science Society of Japan
June 2013	Emeritus Professor, The University of Tokyo (incumbent)
April 2014	Project Researcher, Synchrotron Radiation Research Organization, The University of Tokyo
March 2015	Director of the Company (incumbent)
April 2015	Special Professor, Tokyo City University (incumbent)
July 2016	Project Researcher, School of Engineering, The University of Tokyo
December 2016	Project Researcher, Institute for Solid State Physics, The University of Tokyo (incumbent)

8 KIYOSHI NISHIOKA

Outside Director

Frequency of participation in 2020

Board meetings: 14 times in 14 meetings

Based on his experience at the research, production and sales departments of a steelmaker and in the firm-wide management of technology development, has broad expertise and knowledge. Also conducts activities for technology-oriented management and industry-academia collaboration as a university researcher. Since becoming an outside director of Showa Denko, has been providing objective and useful advice and appropriately supervising the management of the Company's business.

April 1977	Joined Nippon Steel Corporation
April 1997	Plant Manager, Thick Steel Plate Plant, Kimitsu Works, Nippon Steel Corporation (General Manager)
April 2001	General Manager, Thick Steel Plate Sales Department, Head Office, Nippon Steel Corporation
June 2005	Director; General Manager, Technology Development Planning Department, Technology Development Headquarters, Nippon Steel Corporation
June 2009	Counselor, Nippon Steel Corporation
November 2012	Special Professor, Research Center for Advanced Science and Technology, The University of Tokyo
April 2017	Adviser, Research Center for Advanced Science and Technology, The University of Tokyo (incumbent)
April 2017	Visiting Professor, Ehime University (incumbent)
March 2018	Director of the Company (incumbent)
July 2019	Director, VCRI Co., Ltd. (incumbent)

9 KOZO ISSHIKI

Outside Director

Frequency of participation in 2020

Board meetings: 14 times in 14 meetings

Engaged in the financial industry for many years and has abundant expertise across industries, in particular in the chemical industry. As outside director since 2019, has been supervising Showa Denko's business execution and contributing a deep understanding of and advice on its businesses.

July 1969	Joined Japan Development Bank (currently Development Bank of Japan Inc.)
April 1993	General manager, General Affairs Department, Japan Development Bank
May 1994	Executive Secretary, Japan Development Bank
June 1996	General Manager, Industry & Technology Department, Japan Development Bank
May 1998	General Manager, Human Resources Department, Japan Development Bank
June 2001	Executive Director, Development Bank of Japan Inc.
May 2005	Chairman of the Board, Technology Alliance Investment, Ltd.
June 2015	Director, Medical System Network Co., Ltd. (Outside Director) (incumbent)
March 2019	Director of the Company (incumbent)

10 NORIKO MORIKAWA

Outside Director

Frequency of participation in 2020

Board meetings: 11 times in 11 meetings

Note: Frequency after assuming the position

After working for a securities company and an accounting firm, engaged in business management as an accounting/financial manager in the information & communication and automotive component industries. Presently also serves as an outside director for another company. Has a range of knowledge in electronics, automobiles and other key target markets for Showa Denko and supervises the Company's operations.

April 1981	Joined CHORI CO., LTD.
August 1988	Joined Daiwa Securities America Inc.
September 1991	Joined Arthur Andersen
March 1995	Joined Motorola Inc.
March 2005	Director, in charge of accounting and finance; General Manager, Accounting and Finance Headquarters in Japan, Motorola Inc.
June 2009	Joined Bosch Corporation
August 2010	Director; Vice President, in charge of Administrative Headquarters, Bosch Corporation
June 2018	Outside Director, CHORI CO., LTD. (incumbent)
March 2020	Director of the Company (incumbent)
June 2020	Outside Director, Mitsubishi Heavy Industries, Ltd. (incumbent)

Audit & Supervisory Board Members / Corporate Officers (As of June 30, 2021)

Audit & Supervisory Board Members



1 TOSHIHARU KATO

Frequency of participation in 2020

Board meetings: 14 times in 14 meetings

Audit & Supervisory Board meetings: 13 times in 13 meetings

April 1981 Joined Showa Aluminum Corporation (currently Showa Denko K.K.)
 August 2014 General Manager, Finance & Accounting of the Company
 January 2016 Corporate Officer; General Manager, Finance & Accounting Department
 January 2017 Corporate Officer; General Manager, Finance & Accounting Department; Chief Financial Officer (CFO)
 March 2017 Director; Corporate Officer, General Manager, Finance & Accounting Department; Chief Financial Officer (CFO)
 January 2018 Director; Corporate Officer, in charge of Finance & Accounting and Information Systems departments; Chief Financial Officer (CFO)
 January 2019 Director, Assistant to President
 March 2019 Audit & Supervisory Board Member (incumbent)

2 JUN TANAKA

Frequency of participation in 2020

Board meetings: 11 times in 11 meetings

Audit & Supervisory Board meetings: 10 times in 10 meetings

Note: Frequency after assuming the position

April 1982 Joined the Company
 January 2012 Corporate Fellow; Deputy General Manager, Advanced Battery Materials Department
 January 2013 Corporate Officer; General Manager, Advanced Battery Materials Department
 January 2017 Managing Corporate Officer; Chief Technology Officer (CTO)
 March 2017 Director; Managing Corporate Officer; Chief Technology Officer (CTO)
 January 2019 Director; Managing Corporate Officer, in charge of Advanced Battery Materials Division, Institute for Integrated Product Development, Advanced Technology Laboratory, Corporate R&D and Intellectual Property departments; Chief Technology Officer (CTO) (incumbent)
 January 2020 Director, Assistant to President
 March 2020 Audit & Supervisory Board Member (incumbent)

3 KIYOMI SAITO

Outside Member

Frequency of participation in 2020

Board meetings: 14 times in 14 meetings

Audit & Supervisory Board meetings: 13 times in 13 meetings

Based on her experience of launching a business consulting company and a securities company specializing in the online trading of bonds and the knowledge gained through operating these companies, has been appropriately auditing Showa Denko's business execution since becoming outside auditor of the Company in 2012.

April 1973 Joined Nikkei Inc.
 September 1975 Joined Sony Corporation
 August 1984 Joined Morgan Stanley Investment Bank
 January 1990 Executive Director, Morgan Stanley Investment Bank
 April 2000 Director; President, JBond Co., Ltd. (currently JBond Totan Securities Co., Ltd.) (incumbent)
 April 2011 Director; President, The Totan Information Technology Co., Ltd.
 March 2012 Audit & Supervisory Board Member of the Company (incumbent)
 June 2015 Outside Director, Kajima Corporation (incumbent)

4 SETSU ONISHI

Outside Member

Frequency of participation in 2020

Board meetings: 14 times in 14 meetings

Audit & Supervisory Board meetings: 13 times in 13 meetings

Based on his experience of engaging in the management of a bank as a director in charge of internal auditing and in the management of a leasing company, has the ability, knowledge and experience necessary to audit the operation of business in a fair and objective manner. Since becoming outside auditor of Showa Denko in 2018, has been appropriately auditing the Company's business execution.

April 1978	Joined The Industrial Bank of Japan, Ltd. (currently Mizuho Bank, Ltd.)
April 2002	General Manager, 8th Marketing Department, Mizuho Corporate Bank, Ltd. (currently Mizuho Bank, Ltd.)
April 2004	General Manager, 8th Marketing Department and 4th Marketing Department
April 2005	Corporate Officer; General Manager, 14th Marketing Department, Mizuho Corporate Bank, Ltd. (currently Mizuho Bank, Ltd.)
April 2007	Managing Corporate Officer, in charge of Global Syndication Unit and Global Products Unit
April 2010	Vice President; Corporate Officer; General Manager, Internal Audit Division, Mizuho Financial Group, Ltd.
June 2010	Director; Vice President; Corporate Officer; General Manager, Internal Audit Division, Mizuho Financial Group, Ltd.
April 2011	Director; Mizuho Financial Group, Ltd.
June 2011	Director; Vice President, IBJ Leasing Company, Limited
April 2013	Director; President, IBJ Leasing Company, Limited
June 2016	Councilor, Mizuho Financial Group, Ltd.
April 2017	Senior Counselor, Nippon Commercial Development Co., Ltd. (incumbent)
June 2017	Director, NS United Kaiun Kaisha, Ltd. (incumbent)
March 2018	Audit & Supervisory Board Member of the Company (incumbent)

5 MASAKO YAJIMA

Outside Member

Frequency of participation in 2020

Board meetings: 11 times in 11 meetings

Audit & Supervisory Board meetings: 10 times in 10 meetings

Note: Frequency after assuming the position

Based on her extensive international experience as a lawyer and advanced expertise in corporate legal affairs, has served as an outside auditor of Showa Denko since 2020. In particular, she undertakes reviews from a legal perspective for the purpose of ensuring the appropriateness and legality of the Company's business execution related to globalization and M&A projects.

April 1994	Registered at Dai-Ichi Tokyo Bar Association
	Joined Nishimura Law Office (currently Nishimura & Asahi)
March 2001	Registered as a lawyer in the State of New York
April 2004	Assistant Professor, Law School, Keio University
January 2006	Partner, Nishimura & Tokiwa (currently Nishimura & Asahi) (incumbent)
April 2007	Professor, Law School, Keio University (incumbent)
March 2020	Audit & Supervisory Board Member of the Company (incumbent)

Corporate Officers (As of June 30, 2021)

Senior Managing Corporate Officer

JIRO ISHIKAWA General Manager, Device Solutions Division; Officer in charge of Electronics Materials Project and Chichibu Plant

Managing Corporate Officer

KEIICHI KAMIGUCHI Chief Risk Management Officer (CRO); Officer in charge of Internal Audit, Legal, CSR & General Affairs, Human Resources, and Purchasing & SCM departments

Corporate Officers

YOUICHI TAKEUCHI	Plant Manager, Kawasaki Plant
TAICHI NAGAI	Oita Complex Representative
MASUNORI KAIHO	Officer in charge of Kawasaki, Higashinagahara, Isesaki, and Tatsuno plants, Production Technology, Energy & Electricity, SPS Innovation, and Responsible Care departments
TESTUO WADA	General Manager, Institute for Integrated Product Development
HIROTSUGU FUKUDA	General Manager, Petrochemicals Division; Officer in charge of Oita Complex
EISHI WAKUTSU	General Manager, Corporate Strategy Department
KENJIRO YAMAMASU	General Manager, Electronic Chemicals Division; Officer in charge of Tokuyama Plant
KAZUO HIRAKURA	General Manager, Industrial Gases Division; Officer in charge of Basic Chemicals, Electronic Chemicals, and Functional Chemicals divisions

HIROYUKI EDA	Officer in charge of Aluminum Rolled Products, Aluminum Specialty Components, and Aluminum Can divisions and Oyama and Kitakata plants
MAKOTO TAKEDA	General Manager, Carbon Division
KATSUYUKI TSUJI	General Manager, Advanced Battery Materials Division; President, Showa Denko Packaging Co., Ltd.

The above list does not include the following three corporate officers, who concurrently serve as directors.

 For more details, please refer to "Directors" (pages 68 and 69).

Chief Executive Officer: KOHEI MORIKAWA

Managing Corporate Officers: HIDEHITO TAKAHASHI
MOTOHIRO TAKEUCHI

Corporate Officer: HIROSHI SAKAI

Consolidated 11-Year Summary

Showa Denko K.K. and Consolidated Subsidiaries
Each of the fiscal years ended on December 31 of the year

	2010	2011	2012
Financial Highlights (Consolidated)			
For the year			
Net sales	797,189	854,158	739,675
Operating income	38,723	47,357	28,108
Ratio of operating income to sales (%)	4.9	5.5	3.8
Net income (loss) attributable to owners of the parent	12,706	16,980	9,368
Net cash provided by operating activities	66,293	69,437	53,310
Net cash provided by (used in) investing activities	(49,074)	(38,671)	(41,741)
Free cash flow	17,218	30,766	11,569
Net cash provided by (used in) financing activities	(34,494)	(17,295)	(20,150)
R&D expenditures	20,670	21,597	20,633
Capital expenditures	58,035	38,794	42,503
Depreciation and amortization	50,678	49,413	46,232
At year-end			
Total assets	924,484	941,303	933,162
Total net assets	284,965	295,745	314,966
Shareholders' equity ratio	26.1	26.8	29.2
Return on equity (ROE)	5.2	6.9	3.6
Interest-bearing debt*2	351,034	347,308	342,262
Return on assets (ROA)	4.1	5.1	3.0
Debt/equity ratio (gross, times)*2	1.23	1.17	1.09
Per share*3 (yen)			
Net income (loss)—primary*4	8.49	11.35	6.26
Net assets	161.47	168.33	182.24
Cash dividends (applicable to the period)	3.00	3.00	3.00

Demarcation of nonfinancial data varies by item due to the integration process currently underway for Showa Denko and Showa Denko Materials.

Preparations are underway for relevant data integration and disclosure prior to completing corporate integration in 2023.

		2013	2014	2015
Nonfinancial data		Demarcation up to 2019 results		
Number of employees (persons)	Consolidated	10,234	10,577	10,561
Ratio of employees working outside Japan (%)	Consolidated	42.3	43.9	44.4
Number of female managers (persons)	Showa Denko	14	18	23
Ratio of female managers (%)	Showa Denko	1.76	2.28	2.99
Ratio of employees with disabilities (%)	Showa Denko	2.34	2.48	2.71
Discharged amounts of greenhouse gases*6 (kt-CO ₂)	Showa Denko Group companies in Japan	3,792	3,802	3,826
The amount of water used*4 (million m ³)	Showa Denko Group companies in Japan	6,172	6,261	6,004
Final landfill rate of industrial waste*6 (%)	Showa Denko Group companies in Japan	1.30	1.10	0.95
Plastic waste utilization rate*6 (%)	Showa Denko Group companies in Japan	54.6	53.7	63.7
Release of PRTR-listed substances*6 (t)	Showa Denko Group companies in Japan	399	410	461
Number of industrial accidents (including non-lost-time incidents) (cases)	Showa Denko Group companies in Japan*7	7	11	9
Environmental accounting	Showa Denko	6,597	1,664	2,492
Annual numbers of complaints about quality (calculated based on Showa Denko's criteria) (cases)	Showa Denko Group companies in Japan	—	—	243

Note:

The tentative accounting policy applied to calculation of 2017 financial results due to consolidation of former SGL GE Holding GmbH was finalized when the Company settled accounts for the third quarter of 2018. Accordingly, the amounts of depreciation and amortization and some other costs for the year ended December 2017 were changed. The amount in the above table includes those retroactively changed numbers for the year ended December 2017.

*1 Excludes amortization of intangible assets resulting from purchase price allocation (PPA) for Showa Denko Materials Co., Ltd.

*2 Interest-bearing debt balance includes debt on lease from the third quarter of 2020, and values of the balance for 2019 and the second quarter of 2020 have been retroactively adjusted accordingly. Also, from the third quarter of 2020, due to Showa Denko Materials Co., Ltd. becoming a consolidated subsidiary, indication of D/E ratio reflects the following situation: regarding preferred shares issued by HC Holdings K.K., a subsidiary, posted under non-controlling interests on the consolidated balance sheets, the value equivalent

Showa Denko made Showa Denko Materials a consolidated subsidiary, and started on July 1, 2020 to incorporate Showa Denko Materials' sales figures and incomes/losses into its consolidated financial statements.

(Millions of yen)

2013	2014	2015	2016	2017	2018	2019	2020
847,803	872,785	775,732	671,159	780,387	992,136	906,454	973,700
25,953	20,551	33,508	42,053	77,708	180,003	120,798	(19,449)
3.1	2.4	4.3	6.3	10.0	18.1	13.3	(2.0)
9,065	2,929	921	12,305	37,404	111,503	73,088	(76,304)
63,565	66,996	61,170	68,949	67,235	149,785	78,554	109,286
(55,203)	(46,876)	(42,497)	(53,754)	(29,866)	(49,338)	(48,156)	(930,047)
8,362	20,120	18,674	15,195	37,369	100,447	30,397	(820,761)
(6,805)	(24,856)	(21,336)	(13,220)	(18,370)	(61,061)	(18,546)	896,521
20,435	20,362	20,289	17,313	18,539	19,735	20,605	34,379
44,370	47,318	44,059	39,276	41,787	41,727	50,216	69,052
39,779	40,673	42,137	38,761	38,565	39,459	37,704	60,592*1
985,771	1,009,843	940,494	932,698	1,026,999	1,074,983	1,076,381	2,203,606
345,811	319,087	308,142	311,231	368,994	465,340	519,433	718,080
30.6	29.7	31.5	31.8	34.3	41.5	46.4	18.4
3.2	1.0	0.3	4.1	11.5	27.9	15.5	(16.9)
353,686	383,124	368,835	359,929	346,726	287,968	298,524	1,060,146
2.7	2.1	3.4	4.5	7.9	17.1	11.2	(1.2)
1.02	1.20	1.20	1.16	0.94	0.62	0.60	1.84
6.06	1.99	6.45	86.27	262.44	758.15	501.03	(523.06)
201.27	209.76	2,076.05	2,080.85	2,473.06	3,057.16	3,423.25	2,782.79
3.00	3.00	3.00	—	80.00*5	120.00	130.00	65.00

2016	2017	2018	2019		2020
10,146	10,864	10,476	10,813	Consolidated	33,684
40.1	44.0	44.2	45.0	Consolidated	54.6
26	28	33	35	Showa Denko + Showa Denko Materials	73
3.44	3.72	4.60	4.90	Showa Denko + Showa Denko Materials	4.71
2.78	2.64	2.39	2.28	Showa Denko + Showa Denko Materials	2.27
3,868	3,815	3,567	3,532	Showa Denko Group companies in Japan + Showa Denko Materials	3,612
5,872	5,947	5,775	5,884	Showa Denko Group companies in Japan + Showa Denko Materials	6,797
0.32	0.38	0.32	0.35	Showa Denko Group companies in Japan + Showa Denko Materials	0.16
63.6	65.7	65.7	68.6	Showa Denko Group companies in Japan	74.7
406	577	558	643	Showa Denko Group companies in Japan + Showa Denko Materials	542
8	8	9	19	Showa Denko Group companies in Japan + Showa Denko Materials Group companies in Japan*7	29
1,962	1,560	2,708	3,392	Showa Denko + Showa Denko Materials	3,391
172	117	80	51	Showa Denko Group companies in Japan	25

to 50% is added to each of interest-bearing debt and shareholders' equity, in consideration of characteristics of the capital. For interest-bearing debt, net value is indicated after excluding cash and deposits and adding debt on lease. Determination of the 50/50 allocation for preferred shares in light of the characteristics of the capital is based on the rating of Japan Credit Rating Agency, dated April 21, 2020.

*3 Showa Denko consolidated every ten shares of common stock into one share on July 1, 2016. "Per share" indicators for 2015 and 2016 (except for cash dividends) are calculated on the basis of the number of outstanding shares after this consolidation.

*4 Net income (loss) per share has been computed based on the average number of shares of common stock outstanding during the respective fiscal year.

*5 Showa Denko resolved payment of dividends of ¥30.00 per share based on the record date of May 11, 2017 at the extraordinary general meeting of shareholders held in June 2017.

Cash dividends applicable to 2017 include this amount.

*6 The annual data are shown for the period from April 1 of the year to March 31 of the next year.

*7 Includes the partner companies.

Management's Discussion and Analysis

Note: The U.S. dollar amounts appearing on the following pages represent the arithmetical results of translating yen into U.S. dollars at the rate of ¥103.50 to US\$1.00, the approximate rate of exchange as at December 31, 2020.

Results of operations

The Group recorded consolidated net sales of ¥973,700 million (US\$9,408 million) in 2020, up 7.4% from the previous year. Sales in the Inorganics segment fell significantly due to a decrease in shipment volumes and lower prices for graphite electrodes resulting from lower worldwide production of steel. Sales in the Petrochemicals, Chemicals, Aluminum, and Others segments also fell. However, sales in the Showa Denko Materials segment increased due to consolidation that started at the beginning of the third quarter of 2020. Sales in the Electronics segment rose slightly.

The cost of sales increased ¥143,221 million, or 21.3%, to ¥814,378 million (US\$7,868 million), reflecting an increase in sales. Selling, general and administrative expenses increased ¥64,272 million, or 56.1%, to ¥178,771 million (US\$1,727 million), due mainly to the new consolidation.

R&D expenditures increased ¥13,774 million, or 66.8%, to ¥34,379 million (US\$332 million), due mainly to the new consolidation.

Operating income of the Group in 2020 fell significantly, and the Group recorded an operating loss of ¥19,449 million (US\$188 million), a deterioration of ¥140,247 million from the previous year. In the Electronics segment, operating income went up due to an increase in shipment volumes of hard disk (HD) media and lithium-ion battery (LIB) materials.

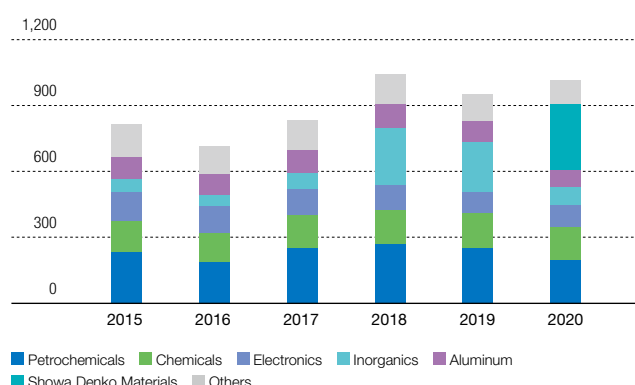
However, the Inorganics segment recorded a sharp decrease in operating income due to lower shipment volumes for graphite electrodes and a drop in book value of the inventory of graphite electrodes resulting from a decline in market prices of products and application of the lower of cost or market valuation accounting method. Operating income in the Petrochemicals segment also decreased due to the impact of the negative spread between purchase and shipment prices of raw naphtha inventory.

Operating income in the Showa Denko Materials segment, which was recently consolidated, also decreased due to lower demand for cars resulting from the spread of COVID-19 and recording of other losses that amounted to about ¥28,000 million, including amortization of goodwill.

The Chemicals, Aluminum and Others segments also recorded falls in profit due to a reduction in shipment volumes of products.

Net sales by segment

(Billions of yen)



Changing the segmentation: LIB materials was transferred from "Others" to "Electronics" from the year ended December 31, 2017. The segment information for the year ended December 2016 is based on the new segmentation. SiC epitaxial wafers for power devices were also transferred from "Others" to "Electronics" from the year ended December 31, 2019. The segment information for the year ended December 2018 is based on the new segmentation. Showa Denko made Showa Denko Materials a consolidated subsidiary, and started on July 1, 2020 to incorporate Showa Denko Materials' sales figures and incomes/losses into its consolidated financial statements.

Information by business segment

A breakdown of net sales and operating income by business segment follows.

Petrochemicals segment

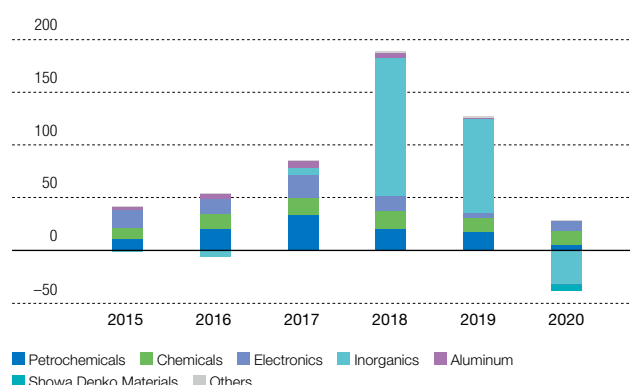
In the Petrochemicals segment, sales dropped by 22.9% from the previous year, to ¥193,385 million (US\$1,868 million). In our olefin business, sales decreased due to lower market prices for products including ethylene and propylene resulting from a fall in prices of crude oil and raw naphtha and a softening supply-demand balance in East Asia in the first quarter caused by a slowdown in the Chinese economy. Sales of organic chemicals decreased due to lower shipment volumes for ethyl acetate and vinyl acetate resulting from the periodic shut-down for maintenance of the plants that produce these products, in addition to the effect of a drop in market prices of organic chemicals. The demand for olefin products in East Asia has been recovering since the second quarter. The Petrochemicals segment recorded operating income of ¥4,927 million (US\$48 million), down 71.4% from the previous year, due mainly to the remaining impact of the negative spread between purchase and shipment prices of raw naphtha inventory caused by a fall in raw naphtha prices.

Chemicals segment

In the Chemicals segment, sales decreased 1.1% from the previous year, to ¥155,769 million (US\$1,505 million). Sales of electronic chemicals rose due to higher shipment volumes resulting from a recovery of production in the semiconductor industry. Sales of coating materials, which were consolidated in the second half of 2019, also increased. However, sales of basic chemicals decreased. Sales of liquefied ammonia and acrylonitrile fell due to lower shipment volumes caused by a decline in domestic demand resulting from the spread of COVID-19. Sales of chloroprene rubber decreased due to a decline in exports. Sales of functional chemicals declined due mainly to a fall in sales volumes in Japan and China. Sales of industrial gases decreased due to a decline in shipment volumes of carbonic acid gas for use in the production of beverages. Operating income for the segment fell 1.3% from the previous year, to ¥13,481 million (US\$130 million).

Operating income (loss) by segment

(Billions of yen)



Electronics segment

In the Electronics segment, sales rose 1.0% over the previous year, to ¥97,415 million (US\$941 million). Sales of lithium-ion battery (LIB) materials increased due to higher shipment volumes of Showa Denko Packaging's aluminum laminate film (*SPALF™*) used as packaging material for LIBs. Sales of compound semiconductors increased due to higher exports. Sales of HD media fell due to lower shipment volumes of media for PCs, despite an increase in shipment volumes of media for use in data centers. For SiC epitaxial wafers, sales increased due mainly to steady shipment volumes of wafers for use in railcars. Operating income for the segment increased 87.2% over the previous year, to ¥9,133 million (US\$88 million).

Inorganics segment

In the Inorganics segment, sales decreased 64.0% from the previous year, to ¥82,899 million (US\$801 million). Sales of graphite electrodes dropped significantly due to a further reduction in the Company's production and sales volumes of graphite electrodes aiming to respond to the weakening supply-demand situation for graphite electrodes in the market resulting from a global slowdown in steel production and the partial clearance of our customers' graphite electrode inventory. Sales of ceramics decreased due to a fall in sales volumes of abrasives and other products resulting from lower production of automobiles and steel. Operating income for the segment recorded a decrease due to a drop in book value for the inventory of graphite electrodes resulting from a decline in market prices of products and application of the lower of cost or market valuation accounting method.

As a result, the segment recorded an operating loss of ¥32,300 million (US\$312 million), a deterioration of ¥121,556 million from the previous year.

Aluminum segment

In the Aluminum segment, sales decreased 17.8% from the previous year, to ¥80,185 million (US\$775 million). Sales of rolled products decreased due to a decline in shipment volumes of high-purity aluminum foil for capacitors resulting from adjustments in production in customer industries for capacitors, including the industrial equipment industry and the onboard equipment industry. Sales of aluminum specialty components fell due mainly to a decline in sales volumes of those for use in the car industry resulting from lower production of cars worldwide and those for use in office automation equipment and machine tools. Sales of aluminum cans dropped due to a reduction in the Group's domestic production capacity and, in the Vietnamese market, a significant fall in production of beer resulting from restrictions on going outside as a countermeasure against COVID-19. The segment recorded operating income of ¥421 million (US\$4 million), down 75.9% from the previous year.

Showa Denko Materials segment

We started to consolidate Showa Denko Materials Co., Ltd. and its subsidiaries in the second quarter of 2020, and therefore we created a new segment for reporting. We started to incorporate sales figures and operating income of the new segment into Showa Denko's consolidated financial statements at the beginning of the third quarter. The Showa Denko Materials segment recorded sales of ¥302,742 million (US\$2,925 million) in 2020. Sales of electronic

materials remained strong, including abrasives for chemical mechanical planarization of the surface of semiconductor chips (CMP slurry) and materials for circuit boards including copper-clad laminates. However, sales of mobility components, including molded resins, remained sluggish.

As a result, the segment recorded an operating loss of ¥6,303 million (US\$61 million). The operating loss for this segment included amortization of the goodwill of the former Hitachi Chemical, which was calculated as a result of the acquisition of shares in the former Hitachi Chemical and other losses amounting to about ¥28,000 million (US\$271 million).

Others segment

In the Others segment, sales fell 15.0% from the previous year, to ¥107,301 million (US\$1,037 million). SHOKO CO., LTD.'s sales decreased due to a fall in market prices of products and reduced demand. Operating income for the segment decreased 34.1%, to ¥1,199 million (US\$12 million).

Information by geographic area

Sales in Japan

Sales in the Petrochemicals segment decreased due to a decline in market prices of petrochemical products resulting from lower raw naphtha prices. Sales in the Chemicals segment fell mainly due to the spread of COVID-19. In the basic chemicals area, sales decreased due partly to lower sales of acrylonitrile and liquefied ammonia resulting from a decline in domestic demand. Sales of industrial gases also decreased due partly to a fall in shipment volumes of carbonic acid gas for beverages and other gases. In the Electronics segment, sales increased due mainly to steady shipment volumes of SiC epitaxial wafers for use in electric trains. In the Inorganics segment, sales of graphite electrodes decreased due to a fall in market prices and a decrease in shipment volumes. Sales of ceramics also dropped due partly to lower shipment volumes of abrasives resulting from a decrease in the production of automobiles and steel. In the Aluminum segment, sales of high-purity aluminum foil for capacitors decreased due partly to a reduction in shipment volumes resulting from production adjustments by industrial equipment manufacturers. Sales of aluminum specialty components also decreased due to lower shipment volumes of products for use as automotive parts. Sales of aluminum cans fell due mainly to lower production capacity. In the Showa Denko Materials segment, sales increased due to the new consolidation. In the Others segment, sales fell due to a decline in sales figures for SHOKO CO., LTD. resulting from a decline in market prices of products and a decrease in demand.

As a result, consolidated sales from operations in Japan increased ¥22,132 million, or 4.4%, to ¥530,804 million (US\$5,129 million).

Management's Discussion and Analysis

Sales in China

Sales in China rose substantially due to the new consolidation of Showa Denko Materials Co., Ltd., despite a significant decrease in shipment volumes of graphite electrodes.

As a result, consolidated sales from operations in China increased ¥41,679 million, or 53.7% over the previous year, to ¥119,360 million (US\$1,153 million).

Sales in Asia (excluding Japan and China)

Sales in the Petrochemicals segment in Asia decreased due to a fall in market prices of olefin products, despite higher export volumes for olefin products. In the Chemicals segment, sales of electronic chemicals rose due to an increase in shipment volumes of high-purity gases for electronics resulting from a recovery of production in the semiconductor and display industries in East Asia. Sales of coating materials also increased due to higher shipment volumes. In the Electronics segment, sales of HD media fell due to lower shipment volumes of media for PCs. In the Inorganics segment, sales of graphite electrodes decreased due to lower demand. In the Showa Denko Materials segment, sales increased due to the new consolidation.

As a result, consolidated sales from operations in Asia (excluding Japan and China) increased ¥63,685 million, or 43.0% over the previous year, to ¥211,674 million (US\$2,045 million).

Sales in the rest of the world

Sales in the rest of the world fell. This was mainly due to a decrease in sales in the Inorganics segment. Sales of graphite electrodes dropped significantly due to a weakening supply-demand situation in Europe and the United States resulting from a decrease in production of steel and the partial clearance of our customers' graphite electrode inventory. However, new consolidation of the Showa Denko Materials segment significantly increased sales in the rest of the world.

As a result, consolidated sales from operations in the rest of the world decreased ¥60,249 million, or 35.0%, to ¥111,862 million (US\$1,081 million).

Other income (expenses) and net income

We recorded a non-operating loss of ¥24,522 million, a deterioration of ¥23,017 million from the previous year. The gap between interest expenses and interest and dividend income deteriorated ¥4,893 million owing to the expenditure of ¥4,580 million (US\$44 million), due mainly to an increase in interest expenses.

We recorded a gain on the equity in earnings of unconsolidated subsidiaries and affiliates to which the equity method is applied of ¥1,245 million (US\$12 million), an increase of ¥497 million due mainly to the addition of Showa Denko Materials' unconsolidated

subsidiaries and affiliates to which the equity method is applied, despite a lower dividend from a synthetic resin production company resulting from a sluggish market.

For foreign exchange gain (losses), the Group recorded foreign exchange losses of ¥2,979 million (US\$29 million), an increase in losses of ¥2,251 million from the previous year, due to the recording of foreign exchange losses at an HD media manufacturing subsidiary in Taiwan, as a result of the depreciation of U.S. dollar against the New Taiwan dollar.

In addition, we expended ¥16,100 million as integration-related expenses, including temporary expenses related to fund raising.

As a result, we recorded an ordinary loss of ¥43,971 million, a deterioration of ¥163,264 million from the previous year. We recorded an extraordinary loss of ¥24,289 million (net), a deterioration of ¥2,879 million from the previous year.

We recorded a gain of ¥18 million (US\$0.2 million), net, on retirement and sales of noncurrent assets, an improvement of ¥4,473 million from the previous year, due mainly to the recording of a gain of ¥2,645 million, net, resulting from sales of land by SHOKO CO., LTD. and Showa Denko Materials Co., Ltd. This gain was despite the recording of retirement losses of ¥2,627 million resulting from removal of old plants that belonged to the Inorganics and Chemicals segments, which are significantly smaller than those in the previous year.

Gain on sales of investment securities (net) increased ¥3,216 million over the previous year, to ¥4,959 million.

We recorded impairment losses of ¥16,602 million (US\$160 million) mainly for ceramics and aluminum, up ¥940 million from the previous year.

We also posted business restructuring expenses of ¥5,908 million (US\$57 million), up ¥4,222 million from the previous year, due mainly to the decision to close a graphite electrode plant in Meitingen, Germany.

As a result, the Company recorded a net loss before income taxes and non-controlling interests of ¥68,260 million (US\$660 million), a deterioration of ¥166,143 million from the previous year.

Consequently, the Company recorded a net loss attributable to owners of the parent of ¥76,304 million (US\$737 million), down ¥149,392 million from the previous year.

Expenses for integration with Showa Denko Materials Co., Ltd. for full year 2020 amounted to ¥38.9 billion, including advisory fees, expenses related to fund raising, interest on borrowing related to share acquisition, and preferred stock dividends.

Expenses for amortization and stepping up of assets belonging to the Showa Denko Materials segment (which was considered to be consolidated on June 30, 2020) totaled ¥29.1 billion for the second half of 2020: amortization of goodwill, etc. ¥17.2 billion; adjustment in cost of sales relating to stepping up of inventories ¥10.9 billion; and adjustment in non-operating expenses relating to investment in and stepping up of other assets ¥1.1 billion.

Financial position

Total assets

Total assets at the end of the year amounted to ¥2,203,606 million (US\$21,291 million), an increase of ¥1,127,224 million from the level at December 31, 2019, due mainly to the increase in cash, deposits, accounts receivable-trade, inventories, tangible fixed assets, and intangible fixed assets resulting from the consolidation of Showa Denko Materials Co., Ltd. and its subsidiaries.

Cash and deposits increased ¥76,896 million from the end of the previous year, to ¥198,982 million (US\$1,923 million).

Net property, plant and equipment rose ¥253,951 million, to ¥727,119 million (US\$7,025 million).

Total investments and other assets increased ¥71,893 million to ¥155,399 million.

Liabilities

Total liabilities increased ¥928,577 million to ¥1,485,526 million (US\$14,353 million), due mainly to the increase in accounts payable-trade, and the increase in interest-bearing debt resulting from acquisition of shares in the former Hitachi Chemical Company, Ltd. Interest-bearing debt increased by ¥756,954 million to ¥1,060,146 million (US\$10,243 million).

Note: We started to include lease liabilities in interest-bearing debts in the third quarter of 2020, and retrospectively adjusted the balance of interest-bearing debts as of the end of 2019 in the same way. Showa Denko made the former Hitachi Chemical Company, Ltd. a consolidated subsidiary through a tender offer, considered June 30, 2020 as the acquisition date, and consolidated the former Hitachi Chemical's financial results into Showa Denko's consolidated financial statements. For the impact of this consolidation on Showa Denko's consolidated balance sheet, please refer to Showa Denko's consolidated financial statements for the first half of 2020.

Net assets

Net assets at the end of the year amounted to ¥718,080 million (US\$6,938 million), up ¥198,647 million from the end of the previous year, due mainly to an increase in non-controlling interests resulting from the issuance of preferred shares accompanying the acquisition of shares in the former Hitachi Chemical Company, Ltd., despite a decrease in retained earnings resulting from posting of net loss attributable to owners of the parent and the payment of dividends for 2019.

Capital expenditures

Capital expenditures increased ¥18,836 million to ¥69,052 million (US\$667 million) because we conducted a careful selection of investment projects and significantly reduced capital expenditures. These actions were taken to cope with a sharp decrease in demand for graphite electrodes and other products resulting from the spread of COVID-19 and despite an increase in capital expenditure amounting to ¥23,128 million resulting from the new consolidation of the Showa Denko Materials segment.

Cash flows

Net cash provided by operating activities increased ¥30,733 million from the previous year, to ¥109,286 million (US\$1,056 million), due partly to a decrease in inventories.

Net cash used in investing activities increased ¥881,891 million, to an expenditure of ¥930,047 million (US\$8,986 million), due partly to the expenditure resulting from the acquisition of shares in a subsidiary accompanying an expansion of the scope of consolidation.

As a result, free cash flow ended in an expenditure of ¥820,761 million (US\$7,930), a decrease in proceeds of ¥851,159 million.

Net cash provided by financing activities rose ¥915,067 million over the previous year, to an inflow of ¥896,521 million (US\$8,662 million), due partly to an upsurge in proceeds resulting from an increase in long-term debt.

As a result, cash and cash equivalents at December 31, 2020 increased ¥76,194 million from the end of the previous year, to ¥197,928 million (US\$1,912 million), including the effect of exchange rate fluctuations.

Consolidated Balance Sheets

Note: The U.S. dollar amounts appearing on the following pages represent the arithmetical results of translating yen into U.S. dollars at the rate of ¥103.50 to US\$1.00, the approximate rate of exchange as at December 31, 2020.

	Millions of yen		Thousands of U.S. dollars
	2020	2019	2020
ASSETS			
Current assets			
Cash and deposits	¥ 198,982	¥ 122,086	\$ 1,922,535
Notes and accounts receivable	287,900	184,425	2,781,647
Allowance for doubtful accounts	(1,092)	(754)	(10,546)
Inventories	190,208	173,667	1,837,757
Other current assets	46,645	17,632	450,675
Total current assets	722,644	497,057	6,982,068
Property, plant and equipment			
Land	264,589	223,997	2,556,419
Buildings and structures	351,987	284,225	3,400,845
Machinery, equipment and vehicles	1,016,307	893,001	9,819,396
Leased assets	34,026	7,759	328,753
Construction in progress	38,980	18,794	376,619
	1,705,890	1,427,777	16,482,032
Less: Accumulated depreciation	(978,771)	(954,608)	(9,456,728)
Net property, plant and equipment	727,119	473,168	7,025,305
Investments and other assets			
Customer related assets	152,564	1,631	1,474,053
Investment securities	106,408	71,786	1,028,101
Long-term loans	741	334	7,158
Net defined benefit asset	21,184	244	204,676
Deferred tax assets	15,883	3,381	153,458
Other	105,609	33,560	1,020,381
Allowance for doubtful accounts	(7,747)	(8,125)	(74,851)
Total investments and other assets	394,643	102,810	3,812,976
Goodwill	359,200	3,346	3,470,529
Total assets	¥2,203,606	¥1,076,381	\$21,290,877

LIABILITIES AND NET ASSETS	Millions of yen		Thousands of U.S. dollars
	2020	2019	2020
Current liabilities			
Short-term debt	¥ 72,645	¥ 52,720	\$ 701,885
Current portion of long-term debt	56,387	31,943	544,803
Notes and accounts payable	191,067	133,730	1,846,058
Income taxes payable	6,041	6,864	58,363
Provision for repairs	28	644	271
Provision for bonuses	8,815	3,050	85,171
Provision for stock payments	13	—	129
Provision for business structure improvement	1,748	1,686	16,887
Other current liabilities	75,327	32,238	727,795
Total current liabilities	412,071	262,875	3,981,361
Noncurrent liabilities			
Long-term debt less current portion	906,365	213,861	8,757,150
Deferred tax liabilities	63,372	7,950	612,287
Provision for repairs	3,168	2,021	30,612
Provision for stock payments	204	200	1,967
Provision for business structure improvement	654	824	6,318
Net defined benefit liability	24,750	9,969	239,129
Deferred tax liabilities for land revaluation	30,241	32,150	292,185
Other noncurrent liabilities	44,701	27,099	431,895
Total noncurrent liabilities	1,073,455	294,074	10,371,543
Contingent liabilities			
Net assets			
Shareholders' equity			
Capital stock			
Authorized, 330,000,000 shares			
Issued (2020): 149,711,292 shares	140,564	—	1,358,102
Issued (2019): 149,711,292 shares	—	140,564	—
Capital surplus	78,190	78,912	755,455
Retained earnings	165,572	249,246	1,599,733
Less: Treasury stock at cost (2020): 3,828,732 shares	(11,657)	—	(112,626)
Less: Treasury stock at cost (2019): 3,836,329 shares	—	(11,664)	—
Total shareholders' equity	372,669	457,057	3,600,664
Accumulated other comprehensive income			
Valuation difference on available-for-sale securities	3,728	9,789	36,024
Deferred gains or losses on hedges	908	433	8,773
Revaluation reserve for land	29,034	33,060	280,524
Foreign currency translation adjustments	(506)	4,140	(4,892)
Remeasurements of defined benefit plans	128	(5,114)	1,236
Total accumulated other comprehensive income	33,292	42,309	321,665
Non-controlling interests	312,119	20,067	3,015,644
Total net assets	718,080	519,433	6,937,973
Total liabilities and net assets	¥2,203,606	¥1,076,381	\$21,290,877

Consolidated Statements of Operations

Showa Denko K.K. and Consolidated Subsidiaries
For the years ended December 31, 2020 and 2019

	Millions of yen		Thousands of U.S. dollars
	2020	2019	2020
Net sales	¥973,700	¥906,454	\$9,407,728
Cost of sales	814,378	671,157	7,868,386
Gross profit	159,322	235,297	1,539,342
Selling, general and administrative expenses	178,771	114,499	1,727,256
Operating income (loss)	(19,449)	120,798	(187,914)
Other income (expenses)			
Interest and dividends income	2,405	2,568	23,237
Equity in earnings of unconsolidated subsidiaries and affiliates	1,245	748	12,029
Gain on sales of investment securities, net	2,934	1,743	28,350
Loss on valuation of investment securities	(315)	(9)	(3,045)
Foreign exchange losses	(2,979)	(728)	(28,778)
Rent income on noncurrent assets	1,522	1,351	14,702
Gain on sales of noncurrent assets, net	2,645	615	25,554
Interest expenses	(6,986)	(2,255)	(67,493)
Loss on retirement of noncurrent assets	(2,627)	(5,070)	(25,380)
Impairment loss	(16,602)	(15,662)	(160,410)
Subsidy income	1,388	65	13,413
Business structuring expenses	(5,908)	(1,686)	(57,081)
Financing expenses	(16,075)	—	(155,314)
Other, net	(9,459)	(4,594)	(91,390)
Total	(48,811)	(22,915)	(471,607)
Income (loss) before income taxes	(68,260)	97,883	(659,521)
Income taxes			
Current	6,891	22,196	66,581
Deferred	(10,051)	386	(97,108)
Net income (loss)	(65,101)	75,300	(628,994)
Net income attributable to non-controlling interests	11,203	2,212	108,243
Net income (loss) attributable to owners of the parent	¥ (76,304)	¥ 73,088	\$ (737,237)
	Yen		U.S. dollars
	2020	2019	2020
Per share amounts			
Net income (loss) attributable to owners of the parent: Basic	¥(523.06)	¥501.03	\$(5.05)
Cash dividends (applicable to the period)	65.00	130.00	0.63

Note: Net income per share has been computed based on the average number of shares of common stock outstanding during the respective fiscal year.

Consolidated Statements of Comprehensive Income

Showa Denko K.K. and Consolidated Subsidiaries
For the years ended December 31, 2020 and 2019

	Millions of yen		Thousands of U.S. dollars
	2020	2019	2020
Net income (loss)	¥(65,101)	¥75,300	\$(628,994)
Other comprehensive income:			
Valuation difference on available-for-sale securities	(6,101)	2,333	(58,950)
Deferred gains or losses on hedges	474	(406)	4,581
Foreign currency translation adjustments	(4,770)	(2,992)	(46,090)
Remeasurements of defined benefit plans, net of tax	5,257	3,131	50,792
Share of other comprehensive income of unconsolidated subsidiaries and affiliates accounted for using equity method	54	(59)	518
Total other comprehensive income (loss)	¥ (5,087)	¥ 2,007	\$ (49,150)
Comprehensive income	¥(70,188)	¥77,308	\$(678,143)
Comprehensive income attributable to:			
Owners of the parent	(81,294)	75,187	(785,454)
Non-controlling interests	11,107	2,121	107,311

Consolidated Statements of Changes in Net Assets

Showa Denko K.K. and Consolidated Subsidiaries
For the years ended December 31, 2020 and 2019

	Thousands	Millions of yen										
	Number of shares of capital stock	Capital stock	Capital surplus	Retained earnings	Treasury stock	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Revaluation reserve for land	Foreign currency translation adjustments	Remeasurements of defined benefit plans	Noncontrolling interests	Total net assets
Balance as at December 31, 2018	149,711	¥140,564	¥78,911	¥197,717	¥(11,659)	¥ 7,489	¥ 836	¥33,281	¥ 7,069	¥(8,244)	¥ 19,377	¥465,340
Dividends from surplus	—	—	—	(21,924)	—	—	—	—	—	—	—	(21,924)
Net income (loss) attributable to owners of the parent	—	—	—	73,088	—	—	—	—	—	—	—	73,088
Purchase of treasury stock	—	—	—	—	(8)	—	—	—	—	—	—	(8)
Disposal of treasury stock	—	—	0	—	3	—	—	—	—	—	—	3
Increase by increase of consolidated subsidiaries	—	—	—	448	—	—	—	—	—	—	—	448
Decrease by increase of consolidated subsidiaries	—	—	—	(367)	—	—	—	—	—	—	—	(367)
Change in treasury shares of the parent arising from transactions with non-controlling shareholders	—	—	1	—	—	—	—	—	—	—	—	1
Changes in liabilities for written put options over non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—
Change due to merger	—	—	—	—	—	—	—	—	—	—	—	—
Reversal of revaluation reserve for land	—	—	—	285	—	—	—	—	—	—	—	285
Net changes of items other than shareholders' equity	—	—	—	—	—	2,301	(404)	(221)	(2,929)	3,130	690	2,568
Balance as at December 31, 2019	149,711	¥140,564	¥78,912	¥249,246	¥(11,664)	¥ 9,789	¥ 433	¥33,060	¥ 4,140	¥(5,114)	¥ 20,067	¥519,433
Dividends from surplus	—	—	—	(11,693)	—	—	—	—	—	—	—	(11,693)
Net income (loss) attributable to owners of the parent	—	—	—	(76,304)	—	—	—	—	—	—	—	(76,304)
Purchase of treasury stock	—	—	—	—	(3)	—	—	—	—	—	—	(3)
Disposal of treasury stock	—	—	(0)	—	11	—	—	—	—	—	—	11
Increase by increase of consolidated subsidiaries	—	—	—	—	—	—	—	—	—	—	—	—
Decrease by increase of consolidated subsidiaries	—	—	—	—	—	—	—	—	—	—	—	—
Change in treasury shares of the parent arising from transactions with non-controlling shareholders	—	—	(1,392)	—	—	—	—	—	—	—	—	(1,392)
Changes in liabilities for written put options over non-controlling interests	—	—	660	—	—	—	—	—	—	—	—	660
Change due to merger	—	—	10	—	—	—	—	—	—	—	—	10
Reversal of revaluation reserve for land	—	—	—	4,323	—	—	—	—	—	—	—	4,323
Net changes of items other than shareholders' equity	—	—	—	—	—	(6,061)	475	(4,026)	(4,646)	5,241	292,052	283,036
Balance as at December 31, 2020	149,711	¥140,564	¥78,190	¥165,572	¥(11,657)	¥ 3,728	¥ 908	¥29,034	¥ (506)	¥ 128	¥312,119	¥718,080

	Thousands	Thousands of U.S. dollars										
	Number of shares of capital stock	Capital stock	Capital surplus	Retained earnings	Treasury stock	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Revaluation reserve for land	Foreign currency translation adjustments	Remeasurements of defined benefit plans	Noncontrolling interests	Total net assets
Balance as at December 31, 2019	149,711	\$1,358,102	\$762,435	\$2,408,175	¥(112,699)	\$ 94,584	\$4,182	\$319,424	\$ 39,998	\$(49,406)	\$ 193,881	\$5,018,675
Dividends from surplus	—	—	—	(112,975)	—	—	—	—	—	—	—	(112,975)
Net income (loss) attributable to owners of the parent	—	—	—	(737,237)	—	—	—	—	—	—	—	(737,237)
Purchase of treasury stock	—	—	—	—	(32)	—	—	—	—	—	—	(32)
Disposal of treasury stock	—	—	(4)	—	106	—	—	—	—	—	—	102
Increase by increase of consolidated subsidiaries	—	—	—	—	—	—	—	—	—	—	—	—
Decrease by increase of consolidated subsidiaries	—	—	—	—	—	—	—	—	—	—	—	—
Change in treasury shares of the parent arising from transactions with non-controlling shareholders	—	—	(13,449)	—	—	—	—	—	—	—	—	(13,449)
Changes in liabilities for written put options over non-controlling interests	—	—	6,377	—	—	—	—	—	—	—	—	6,377
Change due to merger	—	—	97	—	—	—	—	—	—	—	—	97
Reversal of revaluation reserve for land	—	—	—	41,770	—	—	—	—	—	—	—	41,770
Net changes of items other than shareholders' equity	—	—	—	—	—	(58,560)	4,592	(38,901)	(44,890)	50,642	2,821,763	2,734,646
Balance as at December 31, 2020	149,711	\$1,358,102	\$755,455	\$1,599,733	¥(112,626)	\$ 36,024	\$8,773	\$280,524	¥ (4,892)	\$ 1,236	\$3,015,644	\$6,937,973

Consolidated Statements of Cash Flows

Showa Denko K.K. and Consolidated Subsidiaries
For the years ended December 31, 2020 and 2019

	Millions of yen		Thousands of U.S. dollars
	2020	2019	2020
Cash flows from operating activities			
Income (loss) before income taxes	¥ (68,260)	¥ 97,883	\$ (659,521)
Adjustments for:			
Depreciation and amortization	68,643	37,704	663,218
Impairment loss	16,602	15,662	160,410
Amortization of goodwill	9,322	98	90,064
Increase (decrease) in allowance for doubtful accounts	(791)	(700)	(7,646)
Increase (decrease) in provision for business structure improvement	(179)	(494)	(1,730)
Increase (decrease) in net defined benefit liability	2,431	(11,757)	23,488
Interest and dividends income	(2,405)	(2,568)	(23,237)
Interest expenses	6,986	2,255	67,493
Financing expenses	16,075	—	155,314
Equity in (earnings) losses of unconsolidated subsidiaries and affiliates	(1,245)	(748)	(12,029)
Loss (gain) on sales and valuation of investment securities	(2,619)	(1,735)	(25,305)
Loss on retirement of noncurrent assets	2,627	5,070	25,380
Loss (gain) on sales of noncurrent assets	(2,645)	(615)	(25,554)
Decrease (increase) in notes and accounts receivable-trade	14,879	33,489	143,754
Decrease (increase) in inventories	70,713	(21,585)	683,218
Increase (decrease) in notes and accounts payable-trade	(22,744)	(21,898)	(219,748)
Other, net	20,150	(25,591)	194,700
Subtotal	127,540	104,472	1,232,270
Interest and dividends income received	6,546	3,431	63,248
Interest expenses paid	(5,371)	(2,326)	(51,893)
Income taxes (paid) refund	(19,429)	(27,022)	(187,719)
Net cash provided by (used in) operating activities	109,286	78,554	1,055,905
Cash flows from investing activities			
Payments into time deposits	(885)	(53)	(8,553)
Proceeds from withdrawal of time deposits	1,144	53	11,058
Purchase of property, plant and equipment	(64,500)	(40,708)	(623,184)
Proceeds from sales of property, plant and equipment	7,723	1,251	74,623
Purchase of investment securities	(286)	(864)	(2,761)
Proceeds from sales of investment securities	22,697	5,677	219,298
Purchase of investments in subsidiaries resulting in change in the scope of consolidation	(890,230)	(4,851)	(8,601,256)
Proceeds from sales of investments in subsidiaries resulting in change in scope of consolidation	—	529	—
Net decrease (increase) in short-term loans receivable	67	450	650
Payments of long-term loans receivable	(630)	(558)	(6,084)
Collection of long-term loans receivable	275	289	2,658
Other, net	(5,425)	(9,369)	(52,414)
Net cash provided by (used in) investing activities	(930,047)	(48,156)	(8,985,966)
Cash flows from financing activities			
Net increase (decrease) in short-term debt	(9,226)	(29,545)	(89,140)
Proceeds from long-term loans payable	702,163	64,396	6,784,181
Repayments of long-term loans payable	(44,134)	(47,206)	(426,418)
Proceeds from share issuance of bonds	—	20,000	—
Proceeds from issuance of preferred stock	268,503	—	2,594,227
Purchase of treasury stock	(3)	(9)	(32)
Proceeds from sales of treasury stock	18	0	172
Cash dividends paid	(11,674)	(21,861)	(112,794)
Cash dividends paid to non-controlling shareholders	(1,397)	(1,329)	(13,501)
Purchase of investments in subsidiaries without change in scope of consolidation	(1,987)	—	(19,200)
Other, net	(5,740)	(2,992)	(55,459)
Net cash provided by (used in) financing activities	896,521	(18,546)	8,662,036
Effect of exchange rate changes on cash and cash equivalents	434	(2,388)	4,194
Net increase (decrease) in cash and cash equivalents	76,194	9,464	736,169
Cash and cash equivalents at the beginning of the year	121,734	112,835	1,176,175
Increase in cash and cash equivalents resulting from newly consolidated subsidiaries	—	310	—
Decrease in cash and cash equivalents resulting from change in scope of consolidation	—	(875)	—
Cash and cash equivalents at the end of the year	¥197,928	¥121,734	\$ 1,912,344

Corporate Data

(As of December 31, 2020)

Company name Showa Denko K.K.**Formed** June 1, 1939**Capital** ¥140,564 million**Employees (consolidated)** 33,684**Parent** 3,515**Consolidated subsidiaries** 151**Equity method applied** 13**Head office**13-9, Shiba Daimon 1-chome,
Minato-ku, Tokyo 105-8518, Japan

Stock Information

(As of June 30, 2021)

Stock information

Authorized number of shares 330,000,000

Number of Shares Outstanding 149,711,292

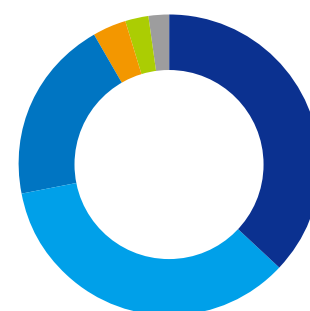
Number of Shareholders 75,013

Note: Showa Denko consolidated every 10 shares of its common stock into one share on July 1, 2016.

Shareholders (top 10)

Shareholder	Stake in Showa Denko	
	Number of shares held (in thousands)	Rate of shareholding (%)
The Master Trust Bank of Japan Ltd. (Trust Account)	11,569	7.92
Custody Bank of Japan, Ltd. (Trust Account)	7,344	5.02
KOREA SECURITIES DEPOSITORY – SAMSUNG	7,016	4.80
GOVERNMENT OF NORWAY	5,221	3.57
Fukoku Mutual Life Insurance Company	4,517	3.09
STATE STREET BANK CLIENT OMNIBUS OM04	2,861	1.96
The Dai-ichi Life Insurance Company, Limited	2,700	1.85
Meiji Yasuda Life Insurance Company	2,512	1.72
Custody Bank of Japan, Ltd. (Trust Account 7)	2,507	1.72
J. P. MORGAN SECURITIES PLC	2,471	1.69

Note: Each rate of shareholding was calculated after deducting the number of treasury shares (3,553 thousand) from the number of shares outstanding.

Shareholders by sector

Financial firms.....	55,349 thousand	36.97%
Foreign corporate entities, etc.	52,410 thousand	35.01%
Individuals.....	29,673 thousand	19.82%
Japanese corporate entities	5,589 thousand	3.73%
Securities firms	3,553 thousand	2.37%
Treasury shares.....	3,138 thousand	2.10%

ESG indexes adopting Showa Denko

FTSE4Good

2021 CONSTITUENT MSCI JAPAN
EMPOWERING WOMEN INDEX (WIN)FTSE Blossom
Japan2021 CONSTITUENT MSCI JAPAN
ESG SELECT LEADERS INDEX

- FTSE Russell (the trading name of FTSE International Limited and Frank Russell Company) confirms that Showa Denko has been independently assessed according to the FTSE4Good criteria, and has satisfied the requirements to become a constituent of the FTSE4Good Index Series. Created by the global index provider FTSE Russell, the FTSE4Good Index Series is designed to measure the performance of companies demonstrating strong Environmental, Social and Governance (ESG) practices. The FTSE4Good indices are used by a wide variety of market participants to create and assess responsible investment funds and other products.
- THE INCLUSION OF SHOWA DENKO K.K. IN ANY MSCI INDEX, AND THE USE OF MSCI LOGOS, TRADEMARKS, SERVICE MARKS OR INDEX NAMES HEREIN, DO NOT CONSTITUTE A SPONSORSHIP, ENDORSEMENT OR PROMOTION OF SHOWA DENKO K.K. BY MSCI OR ANY OF ITS AFFILIATES. THE MSCI INDEXES ARE THE EXCLUSIVE PROPERTY OF MSCI. MSCI AND THE MSCI INDEX NAMES AND LOGOS ARE TRADEMARKS OR SERVICE MARKS OF MSCI OR ITS AFFILIATES.

Business-related and financial information



This report

SHOWA DENKO Report (Showa Denko Group Integrated Report)

Describes various activities of the Showa Denko Group so that its many stakeholders will better understand its efforts for creating value, while providing information concerning both the financial and nonfinancial performance of the Group.



PDF format

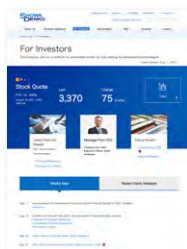
https://www.sdk.co.jp/english/csr/report/csr_report.html



Annual Report

Introduces the Showa Denko Group's business strategies and financial information (English only).

➔ <https://www.sdk.co.jp/english/ir/library/annual.html>



Website

IR information

IR page primarily for investors and shareholders that provides updates of the performance/financial summary, share prices and other data in a timely manner.

➔ <https://www.sdk.co.jp/english/ir.html>

Sustainability-related information

Showa Denko and Showa Denko Materials independently operate websites to post details about ESG (environment, society and governance) activities.

The websites will be integrated in the process of corporate integration.

Website

Sustainability information

Showa Denko



➔ <https://www.sdk.co.jp/english/csr.html>

Showa Denko Materials



➔ <https://www.mc.showadenko.com/english/sustainability/index.html>

Editorial note

Showa Denko and Showa Denko Materials, upholding the purpose of “Change society through the power of chemistry,” are moving forward with the integration project, considering and implementing various initiatives to achieve the milestone goal of completing the integration as a legal corporate entity in January 2023. Taking advantage of the highly complementary lineup of technologies to be held by the integrated company, the two companies intend to create a new business portfolio that can achieve the ideal state of a company with a strong presence in the global market that contributes to a sustainable global society.

In order to create a report to enable our many stakeholders to easily and appropriately understand our strategies and activities aimed at achieving the ideal state, the editorial team of the 2021 report was formed by assigning members from the two companies. We will work to enhance the content and transparency of the report for the future, addressing issues related to the transition phase toward integration.

We welcome the honest feedback of readers of this report.

August 31, 2021

SHOWA DENKO K.K.

Prepared by

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