SHOWA DENKO
Report 2019



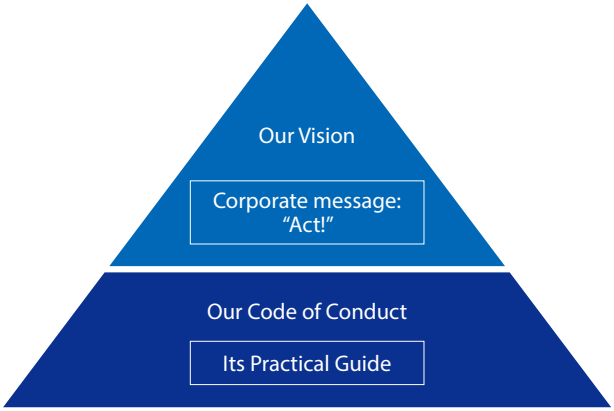
SHOWA DENKO GROUP

Our Vision

Showa Denko Group, under its Vision, has strived to realize "a company contributing to the sound growth of society" that contributes toward creating a society where affluence and sustainability are harmonized.
In order to be trusted and evaluated by society through the continuous improvement of the corporate value, it is important to maintain and develop appropriate relations with stakeholders such as shareholders, customers, business partners, local communities and employees.
Also, in order to realize our Vision and develop the Group sustainably, we have defined what we should do as the "Our Code of Conduct."
In 2019, we renewed our Corporate Message, which serves as our declaration to firmly "promise" our stakeholders this policy.

Our Vision

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.



Corporate message: "Act!"



We shall listen more to customers and further hone our technologies, and shall thereby Act to create products and services that touch "the heart" and Act to offer solutions that make "society" better

Company Profile (as of December 31, 2018)

Company Name	Showa Denko K.K.
Formed	June 1, 1939
Capital	140,564 million
Employee	Consolidated 10,476 Parent 3,347
Subsidiaries & Affiliates	Consolidated subsidiaries : 58 Equity method applied : 11

Head Office 13-9, Shiba Daimon 1-chome, Minato-ku, Tokyo 105-8518, Japan
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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 this integrated report, we disclose the Group's financial as well as nonfinancial information, including descriptions of our consideration for the environment and society, governance, and medium- to long-term management strategies.

As for disclosure items, we analyzed our stakeholders' opinions and requests and covered priority topics, focusing on action policies and performance in 2018 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 CSR activities, including updated information and environmental and social activity reports from each plant.

Prepared by

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Report scope

● Period covered by this Report

This report covers information for the period January 1 to December 31, 2018, with some information also provided for 2019.

● Organization covered

"Showa Denko" as used in the text of this Report refers to Showa Denko K.K., while "Showa Denko Group" refers mainly to Showa Denko and its consolidated subsidiaries in Japan.

● Publication date

July 2019 (The next publication is July 2020)

● Guidelines/guidance referenced

ISO 26000: 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)

About the media to report our CSR information

This REPORT

SHOWA DENKO REPORT 2019 (Integrated Report) (PDF)

The information comprehensively disclosed on the Web [Integrated Report] (PDF), is issued in PDF as an annual report. We take into consideration the readability, such as the layout at the time of printing, and each chapter can also be printed individually.



SHOWA DENKO REPORT 2019 on the Web Site (HTML)

The CSR measures of the Showa Denko Group are disclosed on our Web site. As well as focusing on the comprehensibility referring to various guidelines, we disseminate information with an improved quickness on the activities performed during the period.

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Showa Denko's Ties with Society

Showa Denko K.K. was formed by the merger of Showa Hiryo K.K. and Nihon Electric Industries K.K. in 1939 and marked the 80th anniversary of its founding in 2019. Used as materials and components in a variety of goods, the Showa Denko Group's products have long been supporting day-to-day activities, thereby enriching daily life and making it more convenient. The Showa Denko Group will continue to conduct its business with awareness of its visible and invisible ties to society.

History

History of Showa Denko

1908	Established Sobo Marine Products K.K. (predecessor of Nihon Iodine K.K.) as a manufacturer and seller of iodine
1921	Established Takada Aluminum Equipment Manufacturing K.K. (which later became Showa Aluminum Corporation)
1926	Established Nihon Iodine K.K. (which later became Nihon Electric Industries K.K.) (Start of Showa Denko)
1928	Established Showa Fertilizers K.K.
1931	The Kawasaki Plant of Showa Hiryos K.K. succeeded in manufacturing ammonium sulfate by using domestic technology.
1934	The Omachi Plant of Nihon Iodine K.K. succeeded in industrializing domestically produced aluminum.
1937	Established Riken Kohaku Kogyo K.K. (which later became Showa Highpolymer Co., Ltd.)
1939	Established Showa Denko K.K. (established by the merger of Nihon Denki Kogyo K.K. and Showa Hiryo K.K.)
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 Established Showa Aluminum Can Corporation, which became the first company to produce aluminum cans in Japan
1988	Acquired a graphite electrode business in the United States and established Showa Denko Carbon, Inc.
2001	Merged Showa Aluminum Corporation
2005	Started mass production of perpendicular magnetic recording hard disks ahead of others in the world
2008	Made Showa Tansan Co., Ltd. (presently Showa Denko Gas Products Co., Ltd.) a consolidated subsidiary
2009	Integrated the hard disk business of Fujitsu Limited and launched Showa Denko HD Yamagata K.K.
2010	Merged Showa Highpolymer Co., Ltd.
2016	Made SunAllomer Ltd. a consolidated subsidiary
2017	Acquired SGL GE, a company engaged in the graphite electrode business (presently SHOWA DENKO CARBON Holding GmbH)

Here, there and everywhere, SHOWA DENKO

The following shows some of the products in which the Group's materials and components are used.

01 Water supply
- Sodium Hypochlorite (Disinfection)

02 Containers for yogurt/jelly
- Aluminum cap seals
- Polypropylene containers

03 Aluminum cans
- Aluminum can bodies and ends

04 Beverages
- Carbon dioxide

05 Snack Packages
- Normal propyl acetate (photogravure ink)

06 Digital cameras
- Semiconductor abrasives
- Titanium oxide (for capacitors)
- High-purity aluminum foil (for capacitors)

07 Flat-panel TVs
- LEDs
- LCD glass polishing material
- Aluminum heat sinks
- Titanium oxide (for capacitors)
- High-purity aluminum foil (for capacitors)
- Acrylic monomers / polymers (resins for color filters)
- Solder resist to protect circuit boards

08 Adhesive
- Emulsion
- Ethyl acetate

09 Cosmetics
- Vitamin C derivatives
- Vitamin E derivatives

10 Personal computers
- LEDs
- High-purity gasses for semiconductor processing
- Solvent for semiconductor processing
- Semiconductor abrasives
- Solder resist Ink
- Alumina (heat radiation materials)
- Ethyl acetate (Adhesive)
- Hard disk media

11 Laser beam printers
- Aluminum cylinders

12 Mobile phones, Smart phones
- Lithium-ion rechargeable batteries
- Aluminum laminate film
- Titanium oxide (for capacitors)
- Solder resist to protect circuit boards

13 Tanks
- Corrosion-resistant coating

14 Semiconductor plants
- High-purity gasses for semiconductor processing
- Solvent for semiconductor processing
- Semiconductor abrasives
- Waste gas treatment equipment

15 Electric steel furnaces
- Graphite electrodes

16 Plant factories
- LEDs
- Carbon dioxide
- Extruded aluminum shelves

17 Thermal Power plants
- Ammonia (remove nitrogen oxides)

18 Hydrogen stations
- Hydrogen (as fuel for fuel-cell vehicles)

19 Wind power plants
- Components for lithium-ion storage batteries
- Vinyl ester resins (blades)

20 Automobiles
- SiC epitaxial wafers for power devices
- Forged aluminum rods
- Cooling devices for power control units
- Lithium-ion rechargeable batteries
- Ultra-bright LEDs
- Synthetic zeolite
- Unsaturated polyester resins ((for lamp reflectors)
- Emulsion (adhesive raw materials)
- Polypropylene
- Chloroprene rubber (for transmission belts)

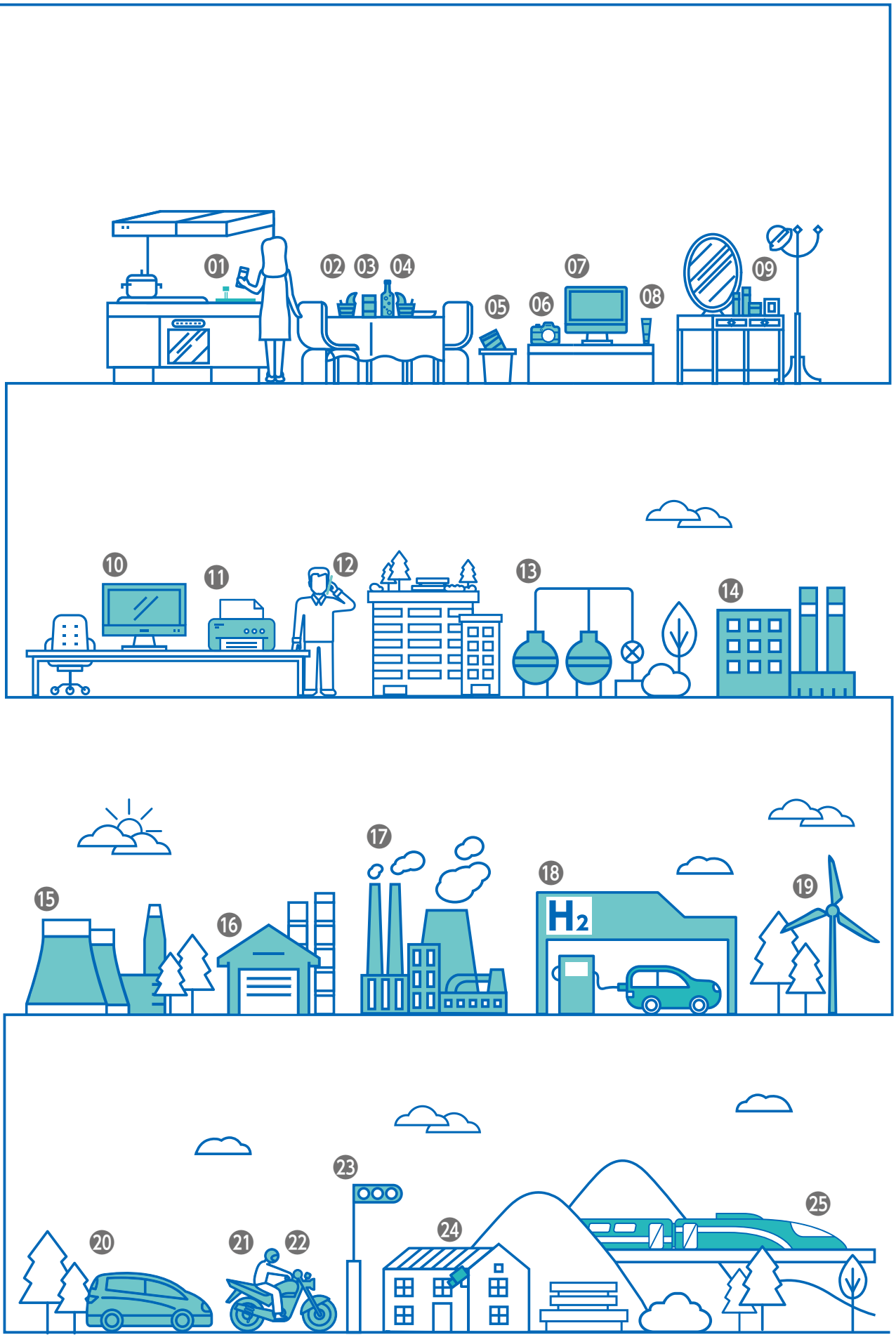
21 Motor bicycle
- Forged aluminum rods

22 Helmets
- Vinyl ester resins

23 Traffic signals
- Ultra-bright LEDs

24 Houses
- Red LEDs
- Hard disk media

25 Railways
- SiC epitaxial wafers for power devices
- Extruded materials of aluminum


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Message from CEO



Based on a "sound present," we will create a hopeful future for all our stakeholders

Kohei Morikawa
SHOWA DENKO K.K.
President and CEO
July 2019

Dramatic changes in the world economy and business environment

The world is undergoing big changes, including climate change, depletion of resources, demographic changes, urbanization, multipolarization of the world economy, and changes in the feedstock/energy-resources market. Moreover, dramatic technological progress, such as in artificial intelligence and IoT technologies, is transforming our economy, society, and daily life.

On the other hand, due to the lingering US-China trade frictions and Brexit issues, there are growing uncertainties about the future of the world economy, and these issues might exert some degree of influence over Japan. Despite these challenges, we need to keep managing our business from a medium- to long-term viewpoint, and avoid being easily swayed by short-term changes in the business environment.

The Showa Denko Group is a unique chemical manufacturer engaged in a wide spectrum of business segments including the Petrochemicals, Chemicals, Electronics, Inorganics, and Aluminum segments. By taking advantage of this uniqueness as well as deepening and fusing our inorganic, metal, and organic technologies, we will produce excellent KOSEIHA products to become a "social contribution company" that contributes to creating a society where affluence and sustainability are harmonized.

Results for 2018 and outlook for 2019

As for 2018, sales increased in five segments, but decreased in the Electronics segment. In particular, in the Inorganics segment, we achieved a substantial increase in sales as a result of having integrated the business of SGL GE of Germany (currently SHOWA DENKO CARBON Holding GmbH) into the graphite electrode business in the latter half of 2017, which boosted the segment's full-year performance. Moreover, the international market showed an upward trend. Consequently, we marked a record high for operating income, ordinary income, and net income for two years in a row.

For 2019, we cannot help being conservative in the seemingly very challenging business environment, but we do expect to achieve an increase in profit by continuing full-scale operation in the Petrochemicals segment and thanks to the upward trend of the international market for graphite electrodes, which we manufacture in the Inorganics segment. In order to return profit to our shareholders in proportion to the favorable business results, we have decided to increase the dividend per share by 10 yen this year to 130 yen.

Launch of "The TOP 2021"

The Showa Denko Group was able to step up its earning power for a "sound present" by implementing the medium-term business plan "Project 2020+" from 2016 to 2018. While attention tends to focus on the substantial increase in profit in two segments—the Petrochemicals segment as well as the Inorganics segment to which the graphite electrode business belongs—we also achieved the predefined medium-term targets and steadily improved profitability in the three segments of Chemicals, Electronics, and Aluminum.

We launched our new medium-term business plan, "The TOP 2021," in 2019 to achieve further growth and create a hopeful future based on a "sound present."

As the key to successfully implementing this plan, we have

adopted the backcasting method. Backcasting helps us clarify the gaps between our present businesses and KOSEIHA Businesses, which we should establish in the future, and foster measures to narrow the gaps.

In order to show the direction in which we should move forward to narrow the gaps, we have recategorized the existing businesses into new portfolios: "Enhance," "Grow," and "Change." By adding "Create" to these three, we now have four portfolios, with which we will conduct our business operations. We will also enhance our R&D, marketing functions, measures for AI/IoT, and production bases, regarding them as the basis to support the strategies as described above.

By implementing these Group management strategies, the Showa Denko Group will increase sales by 40% to 3.4 trillion yen during the three-year period of "The TOP 2021," relative to the figures described in "Project 2020+." We will also expand our operating income by 1.7 times to 480 billion yen and net income to 330 billion yen over the three years.

To achieve such growth, we will give due consideration to asset efficiency, including ROA and ROE, and make efficient and proactive growth investments, which will in turn help increase our profitability.

Targets (3 year total)

Net sales **3,400.0**billion	
Operating income **480.0**billion (Operating margin 14.1%)	Net income **330.0**billion
ROA*1 **12.6%**	ROE*2 **19.5%**

*1: 3-year simple average, O.I. base *2: 3-year simple average

Expansion of KOSEIHA Businesses

The term "KOSEIHA Company," which represents the Showa Denko Group's vision, refers to an aggregate of KOSEIHA Businesses, for each of which the Group takes the top spot in a market of a suitable size (several 10 billion to several 100 billion yen) for the Group.

To achieve this vision, we need to optimize the segments for each of Showa Denko's businesses. Under "Project 2020+," we have made progress with the optimal segmentation of our businesses. Under "The TOP 2021," we will sophisticate our existing business model and achieve business expansion in growth markets as well as across regions and business domains, thereby strengthening and expanding each of the business segments. We will work to increase the number of businesses, including new businesses, that can match the success of the HD, high-purity gas for electronics, and graphite electrode businesses, with an eye to transforming at least half of our existing businesses into KOSEIHA Businesses by 2025 as our medium- to long-term management target.

While making progress to achieve the KOSEIHA Company vision we will strive to maximize the "CUSTOMER Experience," deeming it as a value that leads us to the enhancement and expansion of the business segments.

It is becoming increasingly difficult to differentiate our products from those of our competitors by quality and pricing alone, and in response to this we will manage our business under the group-wide slogan of providing a "CUSTOMER Experience unique to Showa Denko" for both our products and services.

"KOSEIHA Company" is "an aggregate of KOSEIHA Businesses that can maintain high levels of profitability and stability."

"KOSEIHA Business" is a business in which SDK has a top market share in the market of appropriate scale (tens of billions of yen〜hundreds of billions of yen)

By 2025, make half or more "KOSEIHA Businesses"

Our global No.1 businesses Market size (SDK's share)	
HD media	¥400 billion (25%)
High-purity gases for electronics	¥150 billion (25%)
Graphite electrodes (UHP)	¥300 billion〜 (Over 30%)

(Reference) Features of KOSEIHA Businesses

- Operating margin **10% or more**
- Operating income **Billions of yen or more**
- **Stable profitability tolerant to environmental change**

Toward Sustainable Growth

The Showa Denko Group has been regarding the fulfillment of its corporate social responsibility (CSR) as the basis for its business management. We have been meeting the expectations of all our stakeholders by providing products, technologies, and services that meet the needs of customers and society in addition to conducting business activities in an environment-friendly manner. At the same time, we have been implementing measures to foster compliance, diversity management, and corporate governance.

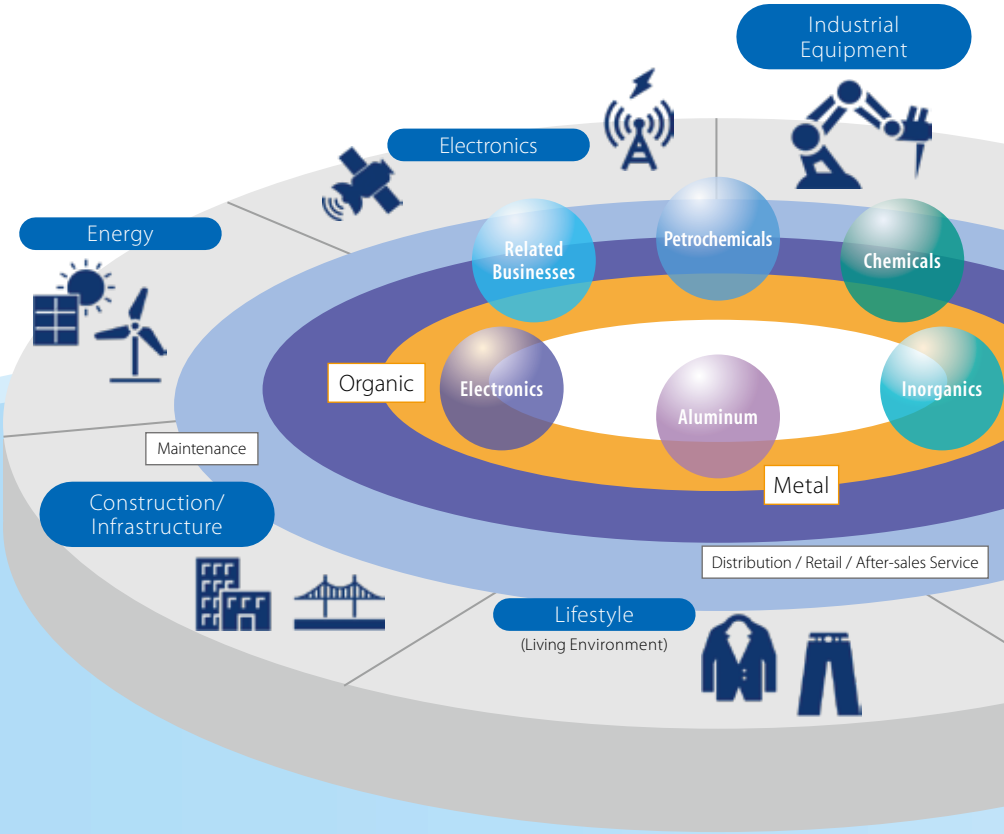
Recently, companies have been required to incorporate environmental, social, and government (ESG) viewpoints into their business management and give due consideration to the Sustainable Development Goals (SDGs). Accordingly, we will foster business that contributes to the creation of a sustainable society, thereby achieving further growth as a going concern that continues to make profit in a stable manner.

We will take actions without being afraid of confronting changes so that the Showa Denko Group can make tremendous achievements as a company contributing to creating a society in which affluence and sustainability are harmonized. We would like to ask you to pay attention to our Group's future activities.

Showa Denko's Value Creation Process

The Showa Denko Group is implementing measures to help solve social issues as described in the SDGs, in consideration of the future market environment and technological changes. We started the medium-term business plan "The TOP 2021" in 2019. In this plan we have set seven business domains, in which we aim to contribute to advances in society in five areas to create economic and social value, thereby becoming a company that satisfies all stakeholders.

- Multi-polarity of world economy
- Changes in the composition of population
- Progress of urbanization
- Dramatic development of technologies
- Changes in the environment surrounding raw materials and fuels
- Climate change and depletion of resources



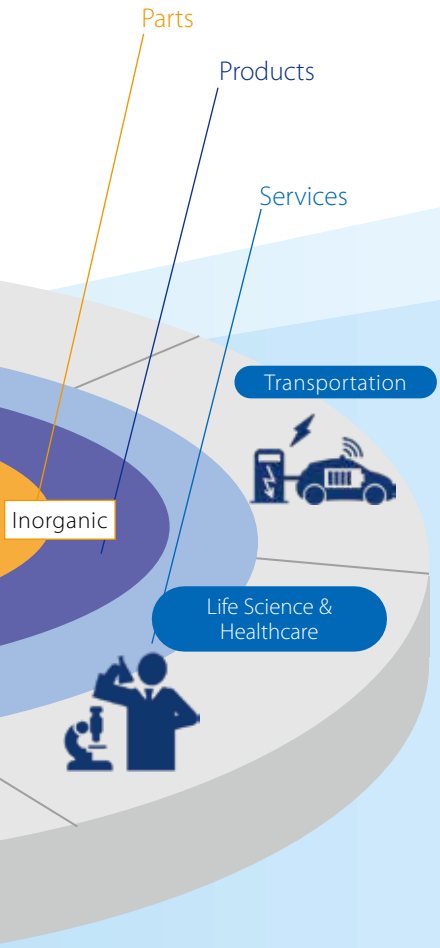
Financial capital
Consolidated total assets
¥1,075.7 billion
(As of December31,2018)

Instrumental capital
Worldwide production bases

Intellectual capital
R&D budget
¥71 billion
(2019-21 total)

Human capital
The number of Group employees
10,476
(As of December31,2018)

Safety & Compliance



Contributing to advances in five areas:

- Digitization
- Weight reduction of cars and application of composite materials
- Improvement in QOL
- Spread of specialty semiconductors
- Shift from goods to experiences / XaaS

Social & relationship capital

Cooperation with business partners

Natural capital

Energy (crude oil equivalent)

1.22 million kl

(2018, Group total)

Economic value

3-year accumulated operating income
(2019 – 2021 total)

¥480 billion

Investment
(2019 – 2021 total)

¥400 billion

Debt/equity ratio
(2021)

About **0.5** times

Total return ratio
(2019 – 2021 total)

About **30%**

Creation of social value

GHG emissions reduction target
(for 2030)

11%
(relative to 2013)

Serious incidents related to equipment/environment

Zero

Rate of lost-time injuries as the group

0.1 or less

Number of female managers

40 female managers
at the end of 2020 and its ratio (5% of all managers)

Ratio of handicapped employees

2.3% or more

Medium-term business plan: "The TOP 2021"

In the following, we will outline the medium-term business plan "The TOP 2021," which we started in 2019, and introduce the measures taken by the Showa Denko Group to achieve the targets set in the plan.

The plan was named "The TOP 2021" because under the plan we will strive to reach the "summit of the mountain" that we are now climbing by 2021, the final year of the plan, as a preparatory step to climb an even higher mountain.

Basic concept

Under "The TOP 2021," we will implement the following strategies for the realization of our Mission, Vision and Value.

"KOSEIHA Company," which is our Vision, is an aggregate of KOSEIHA Businesses that can maintain high levels of profitability and stability. The Group aims to make half or more if its businesses KOSEIHA Businesses by 2025. Therefore, in The TOP 2021, the Group will change its course toward long-term business growth, thereby establishing a stable foundation which will continuously support the Group's growth far into the future.

In addition, we must maximize shareholders' value, customers' value and social value in order to accomplish our Mission, "We will satisfy all stakeholders." To accomplish this, the Group must mobilize each employee's power. The Group will provide stages full of pride and dreams for the employees to support their value creation activities, aiming to make itself a promising corporate group.

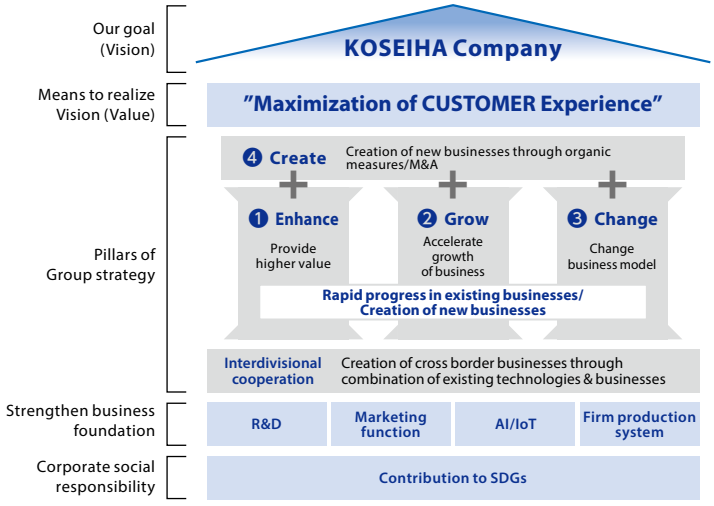
Medium-term business plan: **"The TOP 2021"**

Showa Denko Group's Mission, Vision and Value

Mission (Showa Denko Group's business philosophy)
Satisfy all stakeholders

Vision (Our goal)
KOSEIHA Company
An aggregate of KOSEIHA Businesses that can maintain high levels of profitability and stability.)

Value (Means to realize Vision)
Maximization of CUSTOMER Experience
Change our business model and offer solutions beyond manufacturer's limits



Dramatic improvement in existing businesses

The Showa Denko Group has classified its businesses into three business portfolios: "Enhance," "Grow" and "Change" in consideration of the markets in which the Group should compete for each of the businesses and the achievements expected of the businesses. Based on this classification, we will strive to develop our businesses into KOSEIHA Businesses.



Enhance

For the businesses included in the "Enhance" portfolio, we aim to increase profitability and stability in somewhat mature markets. Specifically, the petrochemicals, industrial gases, basic chemicals, carbon, and device solution (HD) businesses belong to this group.



Grow

For the businesses categorized into the "Grow" portfolio, we will work to differentiate our products and services in growth markets based on our technologies as well as on our sales and logistics capabilities. We will also proactively make equipment investment to establish a supply system that can respond to the future growth of the market. The electronic chemicals, device solution (SiC-based power semiconductor), electronics materials, and advanced battery materials businesses belong to this group.



Change

For businesses in the "Change" portfolio, we will work to expand each business segment. We will turn businesses in this portfolio into KOSEIHA Businesses by promoting the use of existing technologies across the segments, expanding the application of the technologies, and also fostering

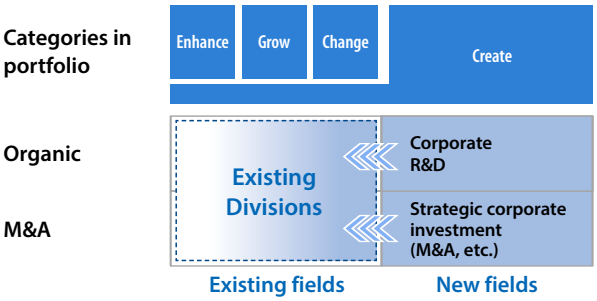
the regional expansion of the businesses, including regions outside Japan. The functional chemicals, ceramics, aluminum rolled products, aluminum specialty components, and aluminum can businesses belong to this group.

Creation of new businesses (Create)

Under "The TOP 2021," we will be more proactive in making R&D investments in promising technological seeds for our future growth while also fostering M&A projects, for which we have appropriated 150 billion yen targeting the period of three years. We will thereby enhance our existing businesses and create new businesses to build a growth foundation.

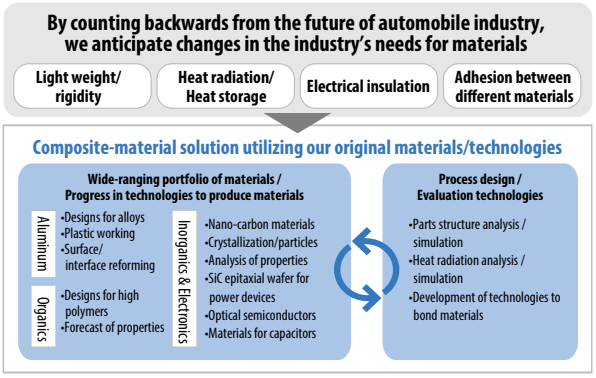
Means to realize "Create"

In addition to R&D, prepare discontinuous measures including M&A



Inter-business cooperation

The Showa Denko Group has a range of materials technologies for aluminum, organics, and inorganics, a value chain extending from the manufacture of materials to molding, and various other technologies accumulated over the years. By combining all of these across our business segments, we will propose the optimal solutions needed by customers. We call this activity "inter-business cooperation" and we will start the first inter-business cooperation project in the automobile field. We will subsequently expand the target of the activity to include other business fields.



Strengthening base of strategy

In addition to strengthening our R&D, we will also implement measures in consideration of the next medium-term business plan to be started in 2022, such as strengthening marketing functions and promoting the introduction of AI/IoT.

Contribution to SDGs

We are implementing all these measures based on our commitment to contributing to the achievement of the Sustainable Development Goals (SDGs).

The Showa Denko Group is strongly committed to contributing to the SDGs through its business activities.

Environmental protection and effective use of resources are becoming more important in society. Based on this recognition, the Showa Denko Group will create both social and economic value to be a company that can satisfy all its stakeholders, including shareholders, customers and society at large.

Financial strategy

The Showa Denko Group aims to achieve annual net sales of about 1.1 trillion yen as well as net sales of 3.4 trillion yen as the total amount for the three-year period of the new medium-term business plan. We thereby take on the challenge of achieving a growth rate of 40% relative to the targets set in "Project 2020+."

We will also substantially increase our operating income by 1.7 times to achieve 330 billion yen in total net income for the three years and annual average net income of 110 billion yen.

In pursuing such growth, we will give due consideration to asset efficiency as indicated by ROA and ROE and will make efficient and proactive investments for the simultaneous achievement of a high growth rate and high profitability.

Targets (3 year total)

Net sales 3,400.0 billion	
Operating income 480.0 billion (Operating margin 14.1%)	Net income 330.0 billion
ROA*1 12.6%	ROE*2 19.5%

*1 3-year simple average, O.I. base *2 3-year simple average

Message from CFO

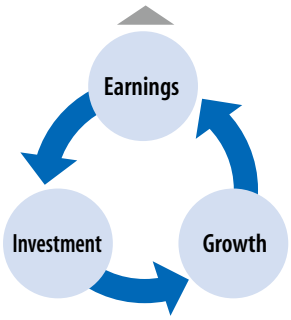


We are working to further increase our corporate value

Motohiro Takeuchi
Director
Corporate Officer
Chief Financial Officer (CFO)

Under the medium-term business plan "The TOP 2021," we will redirect our business strategies toward long-term growth, with a view to creating a "promising future" based on the "sound present" that we have built under the previous three-year business plan. We will establish a growth foundation during the "The TOP 2021" three-year period so that we can boost both shareholder returns and strategic investments based on increasing cash flow. As indicated by the profit enhancement model in the figure below, we will make investments by using earnings and achieve growth through the investments, thereby making more profit. By executing this cycle, we will make more and more profit to secure funds to satisfy all stakeholders.

Funds to satisfy all stakeholders

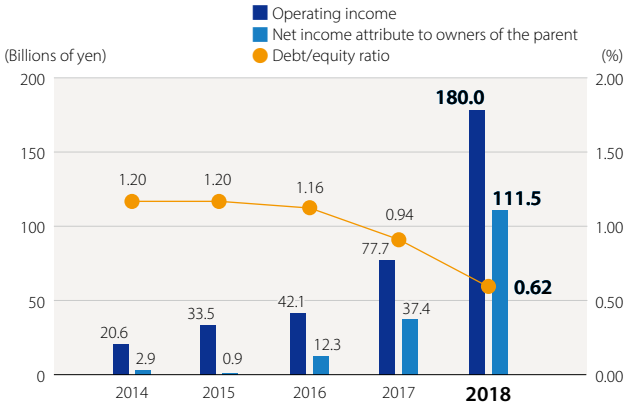


In the new medium-term business plan, we uphold the following numerical targets (for the three-year total): net sales of 3,400 billion yen, operating income of 480 billion yen, and net income attributable to owners of the parent of 330 billion yen. We are taking on the challenge of achieving a growth rate of 40% for net sales relative to the target set in the previous medium-term business plan.

We will strive to achieve substantial growth while giving due consideration to our asset efficiency by setting the ROA and ROE targets. We will maintain our debt-to-equity ratio at the level of around 0.5 by making use of financial leverage, and will invest a total of 400 billion yen in equipment and M&As during the three-year period by using the funds generated by enhancing our earning power. We will make efficient and proactive investments for the simultaneous achievement of a high growth rate and high profitability.

For shareholder returns, we will achieve the total payout ratio of 30% in 2021, thereby returning even more profit to shareholders.

As for stock rating, we were given a "Single A" rating in March. We will work to win a higher rating and become a corporate group that can satisfy all stakeholders by constantly making improvements to increase our corporate value.



(million yen)

For the year	2013	2014	2015	2016	2017	2018
Net sales	847,803	872,785	775,732	671,159	780,387	992,136
Operating income (loss)	25,953	20,551	33,508	42,053	77,708	180,003
Ratio of Operating income to sales (%)	3.1	2.4	4.3	6.3	10.0	18.1
Net income (loss)	23,488	21,731	32,050	38,690	63,851	178,804
Net income attribute to owners of the parent	9,065	2,929	921	12,305	37,404	111,503
Net cash provided by operating activities	63,565	66,996	61,170	68,949	67,235	149,785
Net cash provided by (used in) investing activitie	(55,203)	(46,876)	(42,497)	(53,754)	(29,866)	(49,338)
Free cash flow	8,362	20,120	18,674	15,195	37,369	100,447
Net cash provided by (used in) financing activities	(6,805)	(24,856)	(21,336)	(13,220)	(18,370)	(61,061)
R&D expenditures	20,435	20,362	20,289	17,313	18,539	19,735
Capital expenditures	44,370	47,318	44,059	39,276	41,279	41,727
Depreciation and amortization	39,779	40,673	42,137	38,761	38,454	39,459
At year-end	2013	2014	2015	2016	2017	2018
Total assets	985,771	1,009,843	940,494	932,698	1,026,999	1,074,983
Total net assets	345,811	319,087	308,142	311,231	368,994	465,340
Shareholders' equity ratio (%)	30.6	29.7	31.5	31.8	34.3	41.5
Return on equity (ROE) (%)	3.2	1.0	0.3	4.1	11.5	27.9
Interest-bearing debt	353,686	383,124	368,835	359,929	346,726	287,968
Debt/equity ratio (Times)	1.02	1.20	1.20	1.16	0.94	0.62
Per share (yen)	2013	2014	2015	2016	2017	2018
Net income—primary	6.06	1.99	6.45	86.27	262.44	758.15
Cash dividends (applicable to the period*)	3	3	3	—	50	120

(Note) SDK consolidated every ten shares of its common stock into one share on July 1, 2016. The above-mentioned numbers in the section of "Per share (yen)" are calculated on the assumption that the share consolidation had been carried out at the beginning of 2016.

*SDK resolved and paid a dividend of ¥30 per share based on the record date of May 11, 2017 at the extraordinary general meeting of shareholders which was held in June 2017.

Contribution to the Solution of Social Issues

Toward solving the issue of ocean plastic waste

As a material that is convenient, highly durable, and able to be produced at a low cost, plastic is used in a wide range of applications.

However, many plastic products are disposable and waste plastics are often discharged into the environment without being treated appropriately.

The issue of ocean plastic waste, which is becoming a social concern, is caused by waste plastics that have not been treated appropriately being discharged into rivers, and then carried out to sea.

There is a vast amount of plastic waste in the sea, which seriously affects tourism, fishing, and aquaculture as well as marine ecosystems.

The Showa Denko Group is making effective use of waste plastics and preventing them from becoming ocean waste. In the following we detail this initiative.

Making ammonia by using waste plastics

The Kawasaki Plant of Showa Denko K.K. is located in Kawasaki City, Kanagawa Prefecture. Kawasaki City is certified by the Ministry of Economy, Trade and Industry as an "Eco-Town."

The "Eco-Town" project is designed to foster the creation of advanced environment-friendly communities. It deems "zero emissions" as the basis for the creation of an environment-friendly regional economy and as a major driving force for regional revitalization.

In support of the Eco-Town project, the Kawasaki Plant established a chemical recycling facility for waste plastics that we call the Kawasaki Plastic Recycle (KPR) plant. We began manufacturing hydrogen from waste plastics in 2003 with an eye to ensuring a stable supply of the gas, which is used in the production of ammonia.

At the KPR plant, waste plastic containers, packaging materials, and others collected from each municipality are broken down at high temperatures into (low-carbon) hydrogen and carbon dioxide. The low-carbon hydrogen is used mainly as a source of ammonia while the carbon dioxide is sent to Showa Denko Gas Products Co., Ltd., a Showa Denko Group company, for use in the production of dry ice and carbonated drinks.

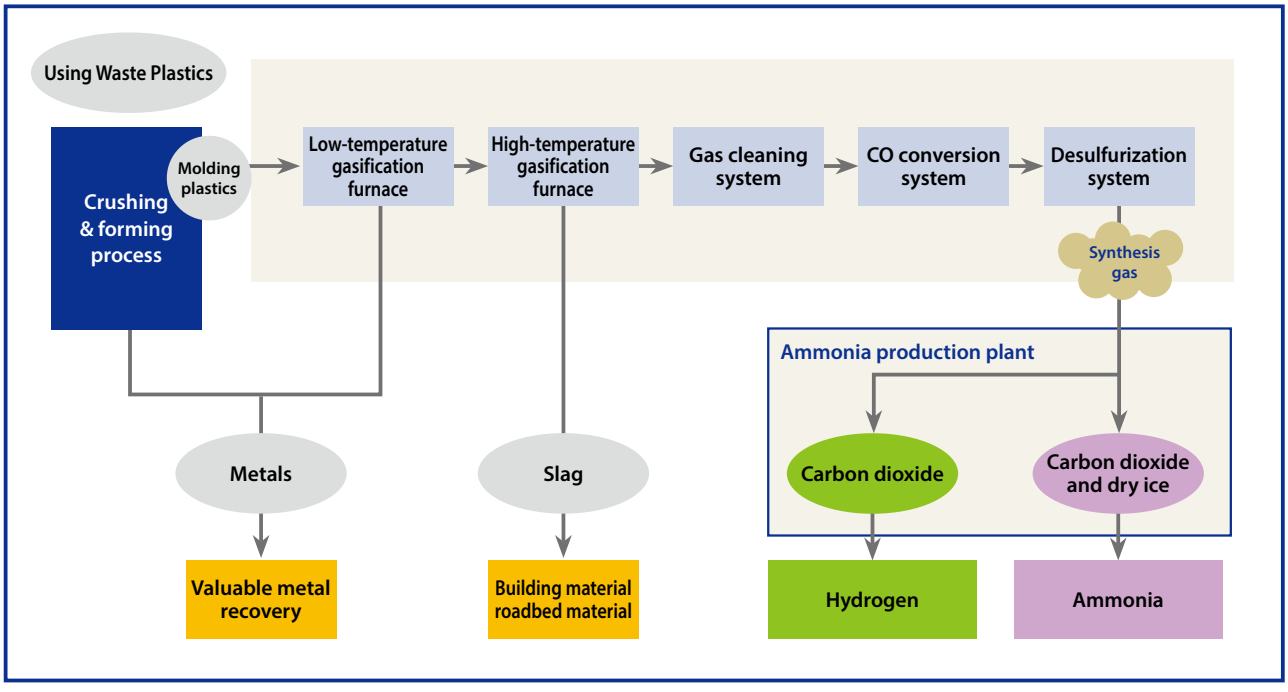


Kawasaki Plastic Recycle plant



Ammonia ECOANN™

■ Mechanism of recycling



ECOANN™ is ammonia produced from recycled plastic

Contribution to the creation of a low-carbon society

The term "low-carbon society" refers to a society with low CO_2 emissions, which are a major component of the greenhouse gases that cause global warming.

In July 2015, Showa Denko concluded an agreement with Kawasaki City to foster mutual cooperation toward the creation of a low-carbon society based on hydrogen energy. Since then, the two parties have been conducting examinations and carrying out demonstration tests to expand the application of the low-carbon hydrogen derived from waste plastics toward the creation of a low-carbon hydrogen-based society with low environmental impact.

This project has been implemented as part of the Regional Coordination and Low-carbon Hydrogen Technology Demonstration Project (for fiscal 2015) fostered by the Ministry of the Environment.

Hydrogen station for fuel cell vehicles

In June 2017, we began supplying low-carbon hydrogen to the Shinsuna hydrogen station of Tomoe Shokai Co., Ltd. (in Koto City, Tokyo) for use by fuel cell vehicles (FCVs).



Shinsuna Hydrogen Station

Hotel operated using low-carbon hydrogen

In June 2018, we started to supply low-carbon hydrogen to Kawasaki KING SKYFRONT Tokyu REI Hotel located in Tonomachi in the coastal area of Kawasaki. The low-carbon hydrogen is delivered from our Kawasaki Plant to the hotel via a roughly 5 km pipeline and used as an energy source to drive the pure hydrogen fuel cell system. Of the energy used by the hotel, about 30% is electricity and heat derived from the low-carbon hydrogen.



Kawasaki KING SKYFRONT Tokyu REI Hotel



Fuel cell power generation system

Demonstration tests to be carried out on fuel cell-powered train cars

In June 2019, East Japan Railway Company announced that it was planning to test run prototype train cars equipped with a hybrid system composed of hydrogen fuel cells and storage batteries in and after 2021. By implementing this initiative the railway company aims to diversify its energy use and reduce CO_2 emissions. Showa Denko will supply low-carbon hydrogen for fuel cells used in the initiative.

Attracting attention also from outside Japan

The issue of ocean plastic waste has become a global concern, and we are accepting more requests from people wanting to tour our KPR plant, including those from outside Japan.

Even since the start of 2019, we have welcomed numerous visitors to the plant from all over the world, including staff of foreign embassies in Tokyo (of 14 countries including Canada, South Africa, and Poland), foreign journalists invited to Japan by the Ministry of Foreign Affairs (economics magazine writers from seven countries, such as India, France, and Thailand), senators from France, members of the Italian parliament, and staff from a South Korean TV station.



Visit to the plant by high officials of the Coordinating Ministry for Maritime Affairs of Indonesia (April 20, 2019)



Photo taken with visitors from the Italian government (June 14, 2019)

R&D of the Showa Denko Group

Message from CTO



We will create a culture of technology-based corporate development represented by the key words "deepening," "fusion," and "introduction."

Jun Tanaka
Director
Managing Corporate Officer
Chief Technology Officer (CTO)

Our R&D strategy in the new medium-term business plan The TOP 2021 is to continue taking measures to make existing businesses Koseiha Businesses (individualized businesses), and give priority to establishment of pipelines to create new businesses.

In order to promote individualization of existing businesses, we have reorganized Institute for Integrated Product Development, which had been established in 2016, and will accelerate and expand "deepening" and "fusion" of technologies, and share them in the whole company. Besides, by making Institute for Integrated Product Development function as an organization to pool technical engineers of the whole company, we will promote creation of innovative technologies and human resource development through fusion of diverse engineers and technologies. In this way, we will strengthen our system to make the best use of human resources in terms of quality and quantity. We will also promote open innovation and M&As in order to introduce necessary technologies from outside entities.

To accelerate creation of new businesses through our value-adding pipelines, we will strengthen our marketing function in order to grasp market and technology trends and identify targets for R&D, and invest our R&D resources intensively in 10 notable technical fields, which includes "Multi-material / Adhesion of different materials" and "Process to produce next-generation semiconductors." The 10 notable technical fields correspond to 7 business domains, namely, transportation, energy, lifestyle, electronics, construction/ infrastructure, industrial equipment, and life science & healthcare.

To execute these measures, we will increase R&D personnel by about 10% and R&D investment by about 30% during the period of "The TOP 2021." In addition, we have established "Advanced Technology Laboratory" whose mission is to search for and plan next-generation R&D themes in a liberal way of thinking, free from trends in existing business fields and facing industries. The Advanced Technology Laboratory, which was newly organized in January 2019 under a mission to research next-generation R&D themes and state-of-the-art technologies, will research R&D themes from the perspective of SDGs and ELSI (ethics, legal and social issues).

Through these measures, we will create a culture of technology-based corporate development represented by the key words "deepening (strengthening and handling down)," "fusion," and "introduction."

To realize the concept of "The TOP 2021," we will establish a complex "Stage for Fusion" which will accelerate deepening, fusion and introduction of technologies inside and outside the company. "Stage for Fusion" will be built at an adjacent area of Yokohama Plant, and will come into service in 2022.

By strengthening our R&D activities, we will act to create products and services that touch the heart, and will act to offer solutions that make society better.

Plan for R&D

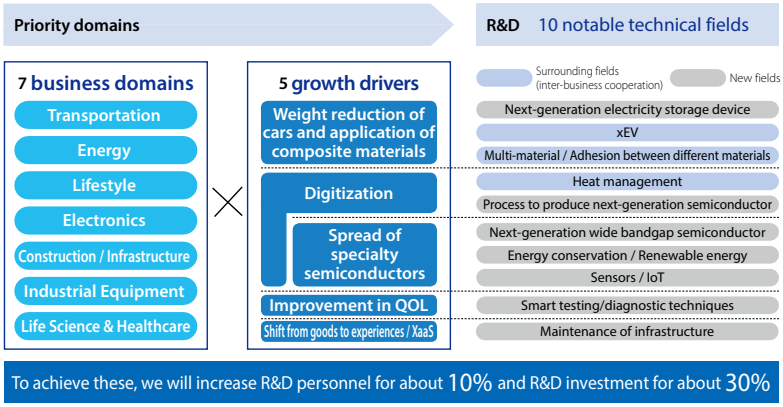
Under the medium-term business plan "The TOP 2021," we plan to invest 71.0 billion in R&D in the 3 years from 2019 through 2021. We will continue to strengthen existing businesses and give priority to establishment of pipelines to create new businesses.

1 Establishment of pipelines to create new businesses

To set up pipelines to create new businesses, we will invest our R&D resources intensively in ten notable technical fields corresponding to seven business domains.

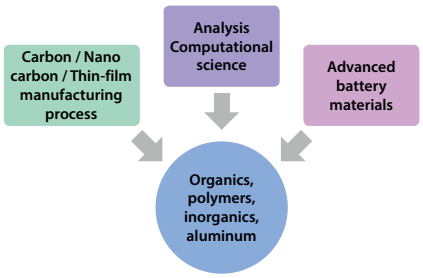
To support this R&D investment program, we will make the best use of 1) technical research activities including technical marketing, which is to investigate trends in advanced technologies and help researchers to set new R&D themes, 2) inter-business cooperation in which several divisions cooperate to collect knowledge and suggest solutions to produce target products, and 3) an in-house campaign to collect ideas from employees.

In addition, we will positively make effective use of open innovation and M&As, aiming to search for R&D themes by introducing technologies from outside entities.



2 Expanding the role of the Institute for Integrated Product Development

The institute for Integrated Product Development (IIPD) has been developing new products through the fusion of technologies in the fields of organics, polymers, aluminum, and inorganics, and has successfully developed many products. On the other hand, we have made so much progress in R&D themes pursued by the Institute for Advanced and Core Technology (IACT), and now we can expect to obtain results. Therefore, we have decided to have IIPD take over those R&D themes pursued by IACT, and continue to strengthen existing businesses. As a result of this change, IIPD can now additionally fuse technologies for batteries, carbon and thin film, and will aim to strengthen their R&D capability further. Moreover, we have integrated operation of the Analysis & Physical Properties Center and Computational Science and Technology Information Center into that of IIPD, aiming to accelerate our R&D processes and obtain results more swiftly.



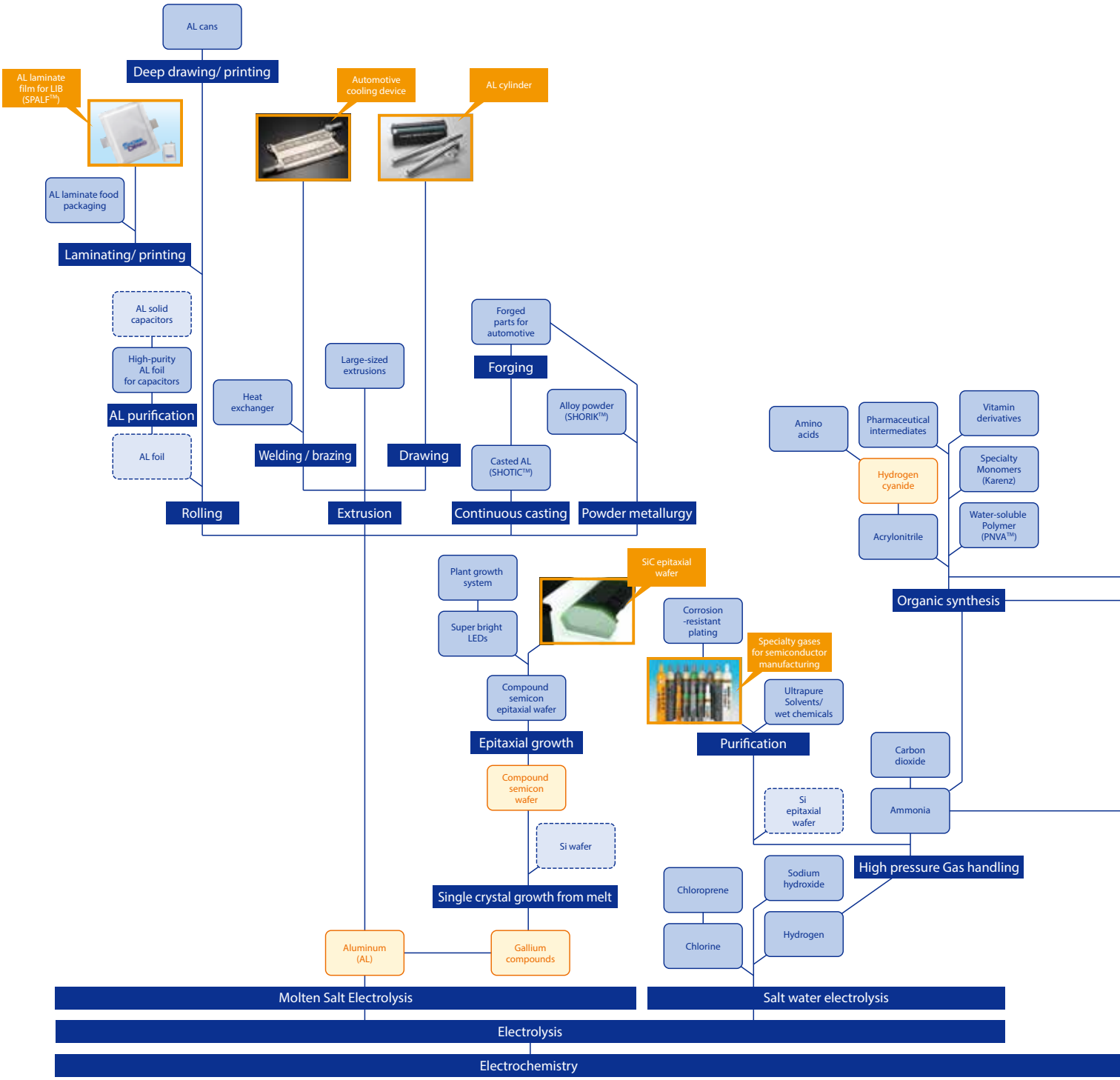
3 New complex Stage for Fusion

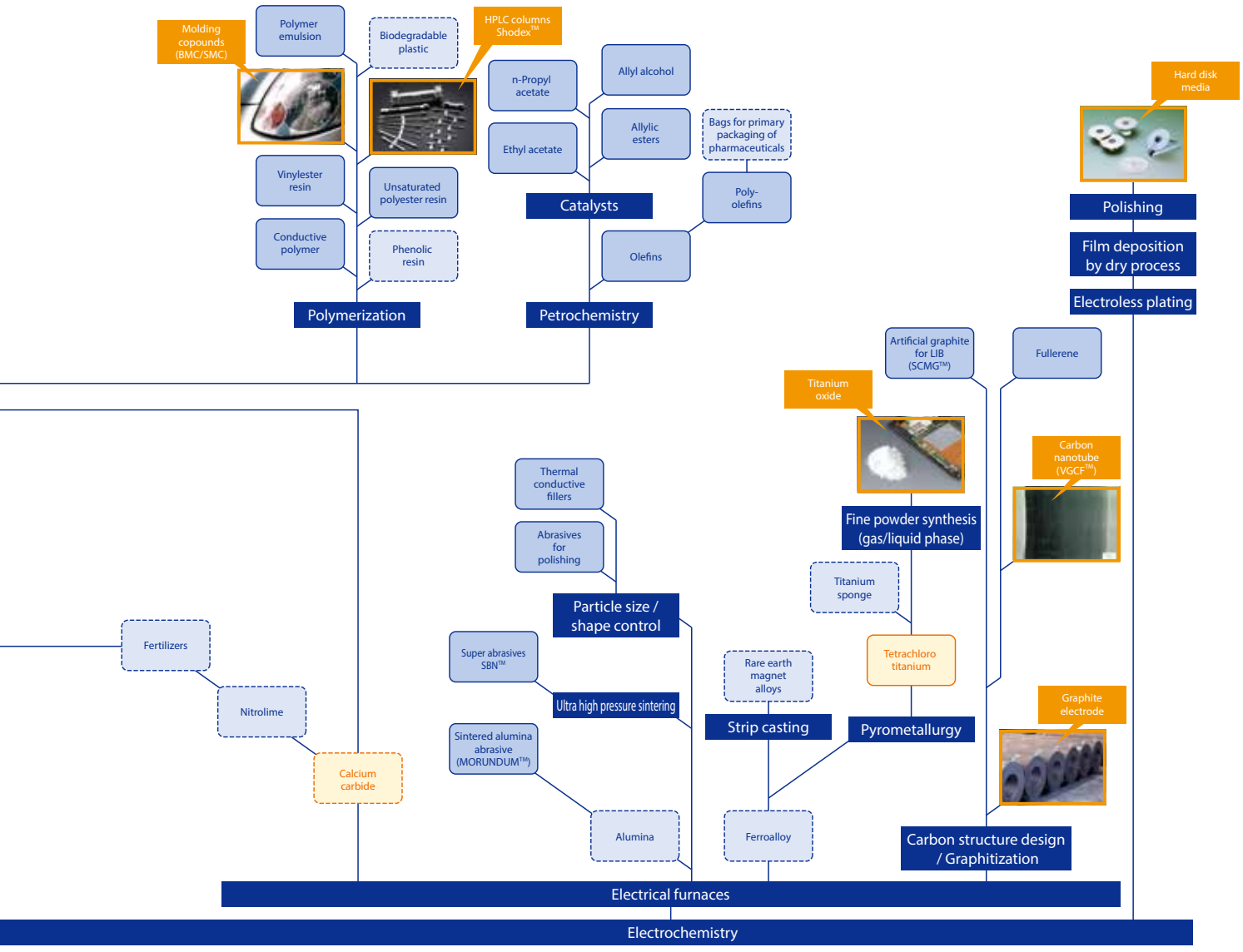
To realize the concept of The TOP 2021, we establish a complex Stage for Fusion, which will accelerate deepening, fusion, and introduction of technologies inside and outside the Company.
At Stage for Fusion, we will 1) search for products and technologies that will become important for society in the future and pursue ways to put them into practical use, 2) improve technologies related to electronics materials and contribute to the realization of Society 5.0*, and 3) create methods to accelerate development of materials by making effective use of AI (artificial intelligence). In this way, we will conduct R&D programs to develop integrated products with the assistance of analytical technologies and computational science, thereby creating new value. We plan to start using the facilities in spring 2022.



Technological Lineage

The Showa Denko Group started its business operations by focusing on the bright future of the electrochemical industry, which utilized one of Japan's important resources: abundant water energy.
Originating from electrochemistry, our Group's technology further evolved to cover the fields of inorganic chemistry, organic chemistry and metal materials. Today, the gene of our original technology is inherited to a wide variety of products that are essential in everyday life, including materials and components used in the information/ telecommunication industry and the automotive industry.




Molding copounds (BMC/SMC)
Polymer emulsion
Biodegradable plastic
HPLC columns Shodex™
n-Propyl acetate
Allyl alcohol
Ethyl acetate
Allylic esters
Bags for primary packaging of pharmaceuticals
Vinylester resin
Unsaturated polyester resin
Poly-olefins
Conductive polymer
Phenolic resin
Olefins
Catalysts
Polymerization
Petrochemistry
Hard disk media
Polishing
Film deposition by dry process
Electroless plating
Artificial graphite for LIB (SCMG™)
Fullerene
Titanium oxide
Carbon nanotube (VGCF™)
Fine powder synthesis (gas/liquid phase)
Thermal conductive fillers
Abrasives for polishing
Titanium sponge
Particle size / shape control
Fertilizers
Super abrasives SBN™
Tetrachloro titanium
Rare earth magnet alloys
Graphite electrode
Nitrolime
Ultra high pressure sintering
Strip casting
Pyrometallurgy
Sintered alumina abrasive (MORUNDUM™)
Calcium carbide
Alumina
Ferroalloy
Carbon structure design / Graphitization
Electrical furnaces
Electrochemistry

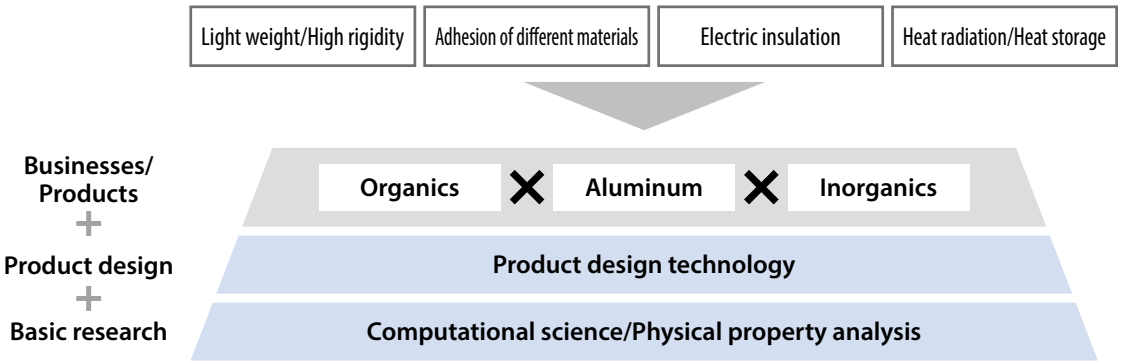
R&D activities for the creation of corporate value

The Showa Denko Group conducts R&D and develops businesses by taking advantage of a range of technologies and products that it has developed for organics, inorganics, and aluminum.

As part of the "inter-business cooperation" activity, which is one of the strategies set in our medium-term business plan started this year, we launched a project to create new automotive composite materials by adopting the backcasting method, in anticipation of the future changes and needs of the market.

In the following we introduce the details of the project and the basic research conducted to support the project.

■ Inter-business cooperation



Project to develop aluminum-resin composite materials Fusing the respective strengths of aluminum and resin

For the development of next-generation vehicles, it is essential to use multiple kinds of materials, such as resin (including CFRP*) and aluminum.

Accordingly, we launched a project to develop aluminum-resin composite materials in 2019. In this project we are developing a bonding technology based on a totally new concept and have already succeeded in bonding multiple thermoplastic and thermosetting resins with aluminum.

Metals such as aluminum have structures that are quite different from those of resins and so it is naturally difficult to firmly bond the former with the latter. However, we invented a method to adjust and bond the two differently structured substances together by making combined use of the aluminum and resin technologies owned by the Showa Denko Group. This newly invented method also makes it possible to bond polycarbonate, polyetherimide, and other amorphous engineering plastics with aluminum.

We will mass-produce and put on sale some aluminum-resin composite materials within the "The TOP 2021" period for adoption by the automobile industry by 2025.

(Comments made by the project team)

*Carbon fiber reinforced plastic

Computational science: Contributing to creating KOSEIHA Businesses by making effective use of AI

The Computational Science and Technology Information Center contributes to increasing the efficiency of development activities by creating theory-based simulations to reduce the frequency of actual testing and by making computational analysis of the reactions and changes that occur in experiments and manufacturing processes but are invisible to the human eye.

The Center engages in almost all of the business fields and development projects to help foster the activities of the development teams.

The Center has also been proactively making use of AI and has already made achievements in the project of NEDO*, in which it has been participating since 2016.

AI has the potential to help dramatically accelerate R&D, for which, however, we need to collect enough data for machine learning.

To meet this requirement, we are examining efficient data collection methods, including building an easy data entry system and using an electronic lab notebook (ELC).

Since the beginning of 2019, we have been working to contribute to the creation of KOSEIHA Businesses by enhancing our computational and information science technologies as members of the Institute for Integrated Product Development.



Photo of the meeting

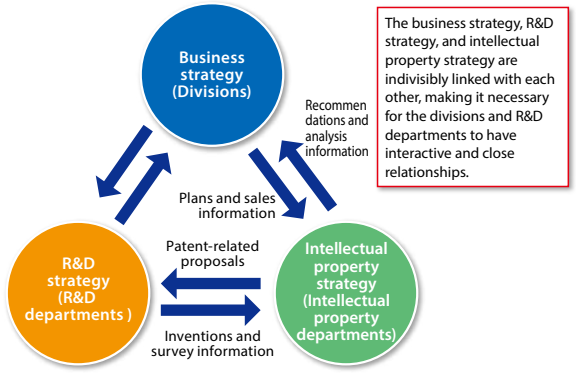
(Comments made by staff of the Computational Science and Technology Information Center)

*New Energy and Industrial Technology Development Organization

Intellectual Propety Strategy

Protection of intellectual property rights

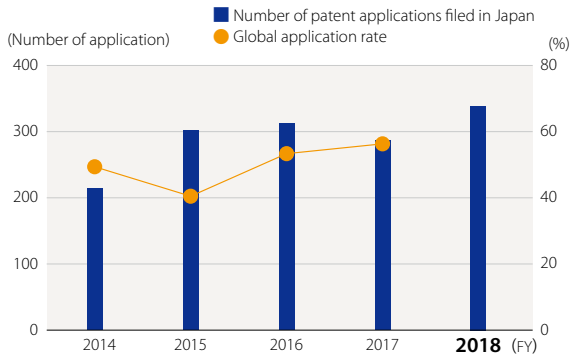
Showa Denko regards the intellectual property strategy as one of its crucial management strategies and is building and implementing it along with the business strategy and R&D strategy as a trinity. We are eternally committed to establishing a strong and wide-ranging patent network for our major businesses and the development of important products to ensure our competitiveness.



Acquisition of intellectual property rights and establishment of patent networks

As the majority of Showa Denko's businesses are operated globally, we aggressively apply for patents in foreign countries with the aim of supporting those businesses from the intellectual property side. Showa Denko's global patent application rate (rate of patent applications filed outside Japan against the number of applications made in Japan) has been as high as around 50% or higher on average.

■ Number of patent applications filed in Japan and the global application rate



Showa Denko is also committed to respecting the intellectual property rights of other companies. We have therefore built a patent monitoring system to keep track of trends in the intellectual rights of others, including patents held outside Japan. Moreover, we are proactively working to protect our trade secrets and copyrights.

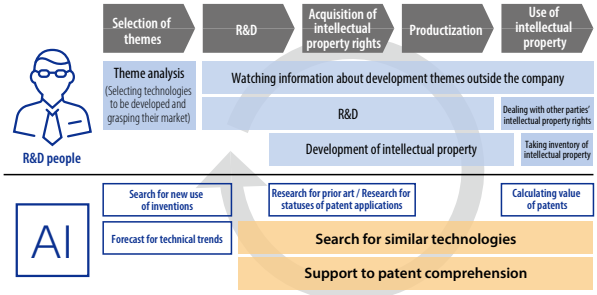
Use of AI

Showa Denko has been proactively making use of AI in the intellectual property field as part of its efforts to spread the use of AI across the company. In 2019, we started to implement the following two measures: (1) application of AI for the sorting of data in order of similarity for SDI* in Japan; and (2) operation of the patent interpretation support system in which the AI developed in partnership with IBM Japan, Ltd. is used.

We will promote the use of AI in the intellectual property field to increase research efficiency and reduce the risk of infringing upon the intellectual property rights of others, as well as to strategically conduct intellectual property-related operations to enhance the competitiveness of our company.

*SDI stands for selective dissemination of information and here refers to the regular sharing of information about patent applications related to the company.

■ Life cycles of products and intellectual properties



System to reward internal inventors

Showa Denko has an incentive system for internal inventors. Under the system, inventors are given rewards for their inventions when a patent application is filed for the invention, the patent is registered, the patent is implemented, and profit is made, and also when license fees are paid by other companies for the patent. In 2019 we revised the rules for this incentive system to further expand it.

In order to promote the filing of more valuable patent applications, we commend our top three employees in terms of number of patent applications filed in the previous year and also the top three employees in terms of the number of patents registered in the previous year.



Ceremony held to commend the internal inventors ranked in the top three (April 2019)

Petrochemicals Segment

Petrochemicals Division



(Billions of yen)

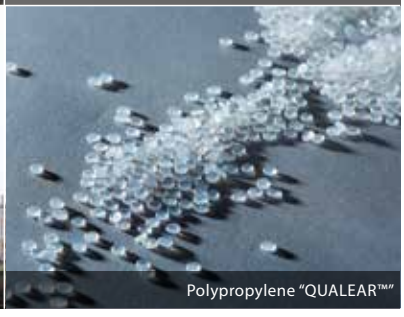
	2018	2017	Increase/ decrease	Increase/ decrease ratio
Sales	268.9	251.1	17.8	7.1%
Operating income	20.3	33.4	(13)	(39.0)%




Ethylene (Naphtha crackers)


n-Propyl acetate (NPAC)


Allyl alcohol


Polypropylene "QUALEAR™"

The Petrochemicals Division consists of the Olefins Department and the Organic Chemicals Department.

The Oita Complex is the main manufacturing bases of the Division and is equipped with a naphtha cracker. As its feature, the Complex has a well-balanced demand structure. The basic materials manufactured by Showa Denko within the Complex are supplied to the plastics, synthetic rubber, and styrene monomer plants that are operated by other companies within the premises as well as to the plant of acetyl derivatives operated by Showa Denko itself. The Division is efficiently integrating new and old cracker equipment and diversifying materials ahead of competitors to enhance its competitiveness.

The Olefins Department provides basic petrochemical products, while the Organic Chemicals Department is expanding its business by using Showa Denko's advanced catalyst technologies for acetyl derivatives.

Ethylene (Naphtha crackers)

We contribute to effective use of resources and high cost competitiveness by not relying solely on naphtha (raw material diversification) to produce ethylene, which is widely used to produce various petrochemicals.

n-Propyl acetate (NPAC)

N-propyl acetate (NPAC) is used in solvents for special gravure printing ink. Because NPAC is friendly to the environment, it is increasingly used in the food packaging industry.

Allyl alcohol

Allyl alcohol is used as a material for surfactants used for diverse applications as well as for the manufacture of eyeglass lenses and aroma essences.

Polypropylene "QUALEAR™"

QUALEAR™ is a new kind of polypropylene manufactured and sold by SunAllomer Ltd. This product, which is well balanced in terms of transparency, resistance to shocks, and rigidity, meets the needs of customers in the food packaging and automobile fields in particular

Chemicals Segment

Industrial Gases Division / Basic Chemicals Division / Electronic Chemicals Division / Functional Chemicals Division / Coating Materials Division

Consolidated sales ratio by segment

14.9%

(Billions of yen)

	2018	2017	Increase/ decrease	Increase/ decrease ratio
Sales	156.5	148.8	7.8	5.2%
Operating income	17.4	16.5	0.9	5.6%

The Industrial Gases Division supplies oxygen, nitrogen, argon and other gases separated from air and also supplies compressed hydrogen, carbonic acid, dry ice and other industrial gases.

The Basic Chemicals Division consists of the Industrial Chemicals Department and the Organic Industrial Department. The Industrial Chemicals Department supplies ammonia, caustic soda, hydrochloric acid and other industrial chemicals and the Organic Industrial Department supplies products such as acrylonitrile, amino acid and chloroprene rubber.

The Electronic Chemicals Division provides semiconductor manufacturers in Japan and overseas with high-purity gas and chemicals as well as noxious-GHG removal equipment for use in semiconductor, LCD panel and other product manufacturing processes.

The Functional Chemicals Division consists of the Functional Polymers Department and the Specialty Chemicals Department. The Functional Polymers Department provides various types of plastics and molding compounds made by using the plastics.

The Specialty Chemicals Department offers innovative and unique products, such as raw materials for cosmetics, resins for use as electronic materials, and columns for high performance liquid chromatography (HPLC).

The Coating Materials Division, founded in July 2019, provides non-stick coating chemicals, which are used on cookware, home electric appliances, automobiles, industrial equipment and others to protect against scorching and prevent unwanted substances from sticking to the surface.



Electronic specialty gases

We produce 20 kinds of high-purity gases for use in the semiconductor, LCD panel, LED, solar cell and other product manufacturing processes, including hydrogen bromide gas, chlorine gas and fluorinated gases.


Electronic specialty gases

Unsaturated polyester resin "Rigolac™"

Rigolac™, unsaturated polyester resin that meets requirements for a lightweight material with high durability and high corrosion resistance, is used for a wide range of applications including automotive components, home appliances, and ocean development.


Unsaturated polyester resin "Rigolac™"

Ammonia "ECOANN™"

ECOANN™ is ammonia produced from recycled plastics. While the quality is on par with that of conventional ammonia, the environmental impact caused by the manufacture of this product is much smaller.



Ammonia "ECOANN™"

Carbon dioxide and dry ice

Showa Denko Gas Products Co., Ltd. contributes to securing safety and stable supply of food resources by supplying carbon dioxide mainly for carbonated beverages and dry ice for cooling.


Carbon dioxide and dry ice

Electronics Segment

Device Solutions Division / Functional Electronic Materials Division / Advanced Battery Materials Division

Consolidated sales ratio by segment

10.1%

*SiC epitaxial wafers business was transferred from the Others segment to the Electronics segment at the beginning of 2019. However, these segment-wise numbers for 2018 are based on the segmentation before this change.

(Billions of yen)

	2018	2017	Increase/ decrease	Increase/ decrease ratio
Sales	105.8	123.1	(17.2)	(14.0)%
Operating income	12.4	21.9	(9.5)	(43.5)%





Hard disks



LEDs



SiC epitaxial wafers



Lithium-ion battery materials

The Device Solutions Division provides hard disks (HD), which are highly functional storage media, and SiC epitaxial wafers for power devices.

In particular, for the HD business, the Division has seven bases around the world, including three in Japan, and provides world-class high-quality products for use by data centers and enterprise users, for which the market is expected to grow due to the spread of cloud computing and the progress of AI-based big data analysis.

The Functional Electronic Materials Division supplies compound semiconductors, such as ultra-bright and high-output LED chips, and rare earth magnetic alloys for high-performance motors.

The Advanced Battery Materials Division provides lithium-ion battery materials and fuel cell battery components such as VGCF™ and SCMG™ (anode material).

Hard disks

As the world's largest hard disk manufacturer and seller, the Showa Denko Group is utilizing the leading-edge technologies to expand the storage capacity of its hard disks, while building the optimal production and supply system to help the Group meet the requests of customers in a smooth manner.

LEDs

We provide a wide range of high-output LED chips ranging from ultraviolet to infrared, for use at indoor farms and in displays as well as for industrial uses such as in sensors

SiC epitaxial wafers

SiC epitaxial wafers are used in next-generation power semiconductors, which are expected to contribute to energy saving. These wafers have been increasingly adopted for use in power supplies for data center servers, devices for railroad vehicles, and for onboard chargers for EVs

Lithium-ion battery materials

For the lithium-ion battery market, we offer a variety of items, including SCMG™ high-input/ output long-life anode material, VGCF™ unique anode and cathode additive featuring high stability and quality, and SPALF™ aluminum laminated film produced and marketed.

Inorganics Segment

Ceramics Division / Carbon Divisio

Consolidated sales ratio by segment

25.4%

(Billions of yen)

	2018	2017	Increase/ decrease	Increase/ decrease ratio
Sales	266.1	73.4	192.7	262.4%
Operating income	132.4	7	125.5	1,797.8%

Capitalizing on its long-accumulated high-temperature fusion technology, high-temperature sintering technology, and the pulverization/classification technology, the Ceramics Division manufactures and sells polishing materials, abrasives, and refractories in which fused alumina, silicon carbide, and boron nitride are used. As for ultrafine titanium oxide, which is used to manufacture multilayer ceramic capacitors (MLCCs) to be mounted on a range of electronic devices, the Division is expanding sales for use in high-end products.

The Carbon Division supplies graphite electrodes for electric steelmaking furnaces. These electrodes are indispensable for the recycling of iron and steel. Showa Denko's graphite electrodes are highly acclaimed by customers around the world. The Division integrated the graphite electrode business of German company SGL GE in 2017 to become the world's No.1 manufacturer in the field. The Division will enhance the development and marketing of volume zone products for the remarkably growing markets of emerging countries while providing advanced markets with high-end products



Graphite electrodes

Graphite electrodes contribute to iron and steel recycling as a component to melt iron and steel scraps in electric steel furnaces. Our graphite electrodes are rated very highly by customers throughout the world due to their excellent quality.

Abrasives and Refractories

Talking advantage of our long experience in fusing, firing, sintering and grinding / classification technologies, we are supplying our customers with high-quality abrasives and refractories.

cBN (cubic boron nitride)

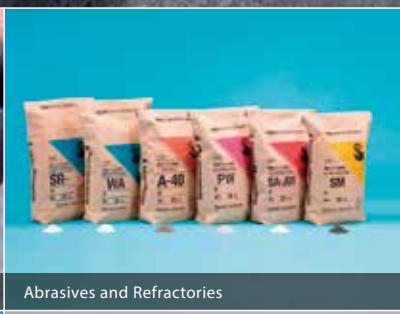
With a hardness coming second only to diamond, cBN is used for tools to cut automotive and other components.

Ceramics for capacitors "SUPER-TITANIA™"

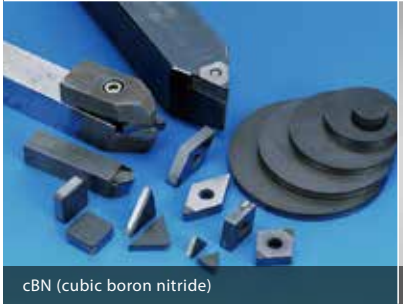
SUPER-TITANIA™ high-purity titanium oxide is used as one of the main materials in ceramic capacitors installed in familiar electronic and electrical devices.



Graphite electrodes



Abrasives and Refractories



cBN (cubic boron nitride)



Ceramics for capacitors "SUPER-TITANIA™"

Aluminum Segment

Aluminum Rolled Products Division / Aluminum Specialty Components Division / Aluminum Can Division

Consolidated sales ratio by segment
10.3%

(Billions of yen)

	2018	2017	Increase/ decrease	Increase/ decrease ratio
Sales	108.3	105.4	2.8	2.7%
Operating income	4.9	6.7	(1.8)	(26.2)%





High-purity aluminum foils



Cooling devices



Aluminum alloy forging "SHOTIC™"



Aluminum Cans

The Aluminum Rolled Products Division provides high-purity aluminum foils, which are carefully purified and manufactured for use in electrolytic capacitors. These capacitors are widely used in a range of products, including home electric appliances and automobile-related devices.

The Aluminum Specialty Components Division provides aluminum materials and processed products. The Division supplies the following products not only in Japan but also in Europe, the United States, and Southeast Asia: aluminum cylinders (core component of laser beam printers), large/complexly shaped extruded products, continuously cast rods of aluminum alloys (SHOTIC™) made using Showa Denko's proprietary technologies, and forged products for automobile parts including compressors for in-vehicle air conditioners.

The Division also supplies a range of heat exchangers for home electric appliances and industrial equipment worldwide and is engaged in the development and manufacture of power semiconductor cooling devices used in hybrid cars, electric vehicles, and solar power generation equipment.

The Showa Denko Group became the first enterprise to manufacture aluminum beverage cans in Japan in 1971. Since then the Aluminum Can Division has been supplying high-quality aluminum cans for beverages through integrated production, including the pressing of can bodies and can ends and the printing of their labels.

High-purity aluminum foils

High-purity aluminum foils are used in electrolytic capacitors, for which meticulous control is needed concerning the purity of materials and the manufacturing processes. The foil is a major material for the electronic component, which is indispensable for the production of industrial machines, home electric appliances and automobiles.

Cooling devices

We provide oil coolers, heat sinks and other heat exchangers for industrial equipment, as well as cooling devices for hybrid car power control units.

Aluminum alloy forging "SHOTIC™"

We are producing SHOTIC™ continuously cast rods of aluminum alloy and their forgings. The fine alloy structure contributes to reducing the weight of automobiles and the products are used as parts for compressors of in-vehicle air conditioners, etc.

Aluminum Cans

Showa Aluminum Can Corporation was the first to manufacture aluminum cans in Japan. Its lightweight and recyclable aluminum cans are sold both in Japan and abroad

Development Themes and Related Businesses

Consolidated sales ratio by segment

13.7%

(Billions of yen)

	2018	2017	Increase/ decrease	Increase/ decrease ratio
Sales	143.4	133.6	9.8	7.3%
Operating income	2.9	0.6	2.3	357.0%





Sound-insulating reproof dual-layer pipe

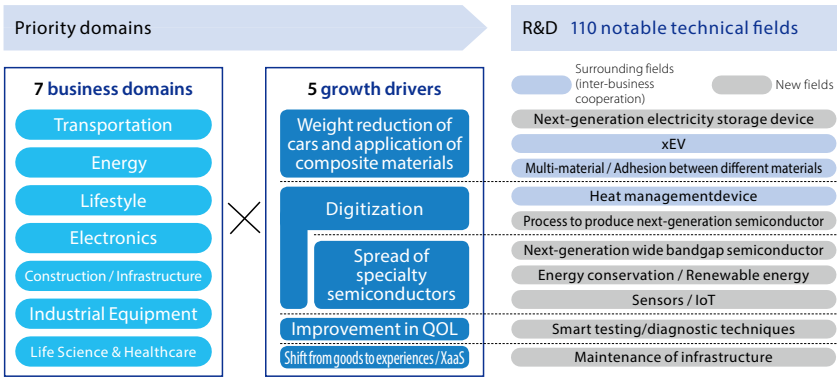


E-POLE

Development Themes

The Showa Denko Group is developing products that meet the increasingly sophisticated needs of the market by combining a range of technologies it has accumulated in the fields of materials design, synthetic reaction and machining processes with base technologies used commonly across the fields, such as those for computational science, analysis and safety tests.

In the medium-term business plan "The TOP 2021," which we launched in 2019, we set the priority domains as shown in the figure on the right. We will implement measures for these domains with speed.



Related Businesses

Included in this section are themes for future businesses as well as the manufacture and sale of various chemical products, light metals, and building and civil engineering materials.

Sound-insulating reproof dual-layer pipe

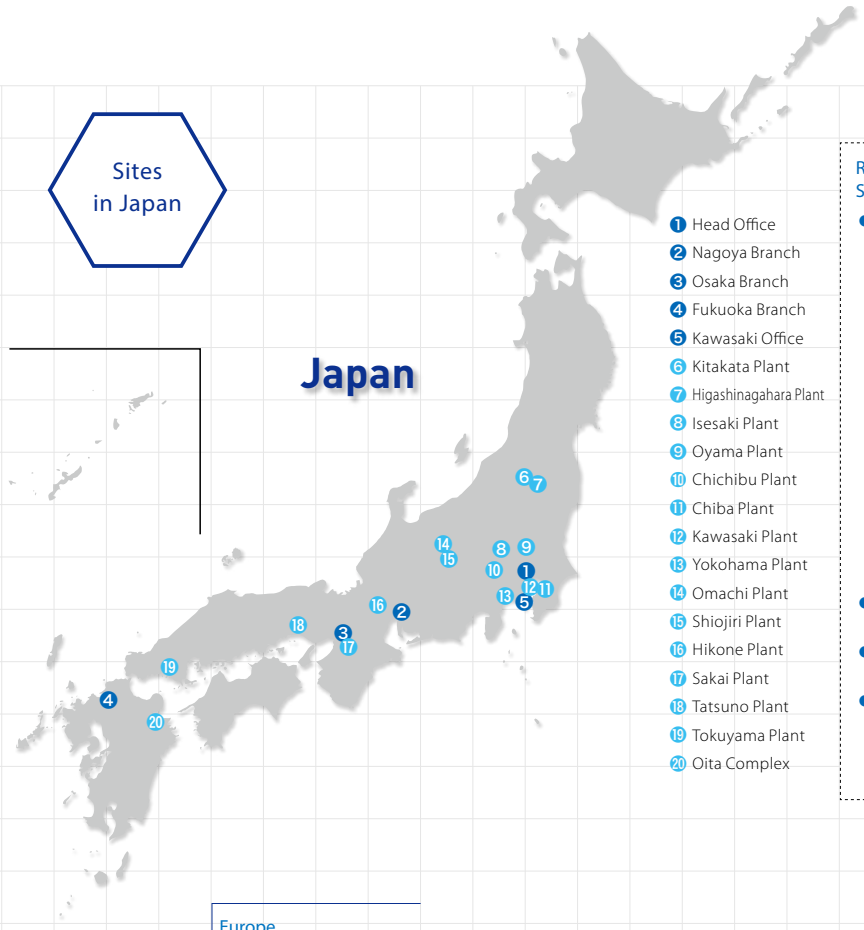
"Showa Sound Insulating FDP," produced and sold by Showa Denko Kenzai K.K., is a high-value-added drain riser adopted by numerous condominiums, hotels and hospitals, featuring superior sound insulation, compact size, fire resistance and ease of construction.

E-POLE lighting system

E-POLE, produced and marketed by Showa Denko Aluminum Trading K.K., stores electricity generated by its photovoltaic cells during the day and uses it to power its LED lamps at night. The system is capable of providing illumination for three to four days continuously even under low light and cloudy conditions.

Locations (as of Marcsh 31,2019)

Sites in Japan



1. Head Office
2. Nagoya Branch
3. Osaka Branch
4. Fukuoka Branch
5. Kawasaki Office
6. Kitakata Plant
7. Higashinagahara Plant
8. Isesaki Plant
9. Oyama Plant
10. Chichibu Plant
11. Chiba Plant
12. Kawasaki Plant
13. Yokohama Plant
14. Omachi Plant
15. Shiojiri Plant
16. Hikone Plant
17. Sakai Plant
18. Tatsuno Plant
19. Tokuyama Plant
20. Oita Complex

Research & Development Sites

- Institute for Integrated Product Development
  - Oita
  - Kawasaki
  - Isesaki
  - Tatsuno
  - Yokohama
  - Shiojiri
  - Chichibu
  - Oyama
  - Kitakata
  - Sakai
  - Chiba
  - Toke
  - Toyama
  - Isehara
- Safety Evaluation Center
- Process Solutions Center
- Advanced Technology Laboratory

Major Subsidiaries in Japan

Petrochemicals segment
Sun Allomer Ltd.
Tsurusaki Kyodo Doryoku K.K.

Chemicals segment
Showa Denko Gas Products Co., Ltd.
Nippon Polytech Corp.

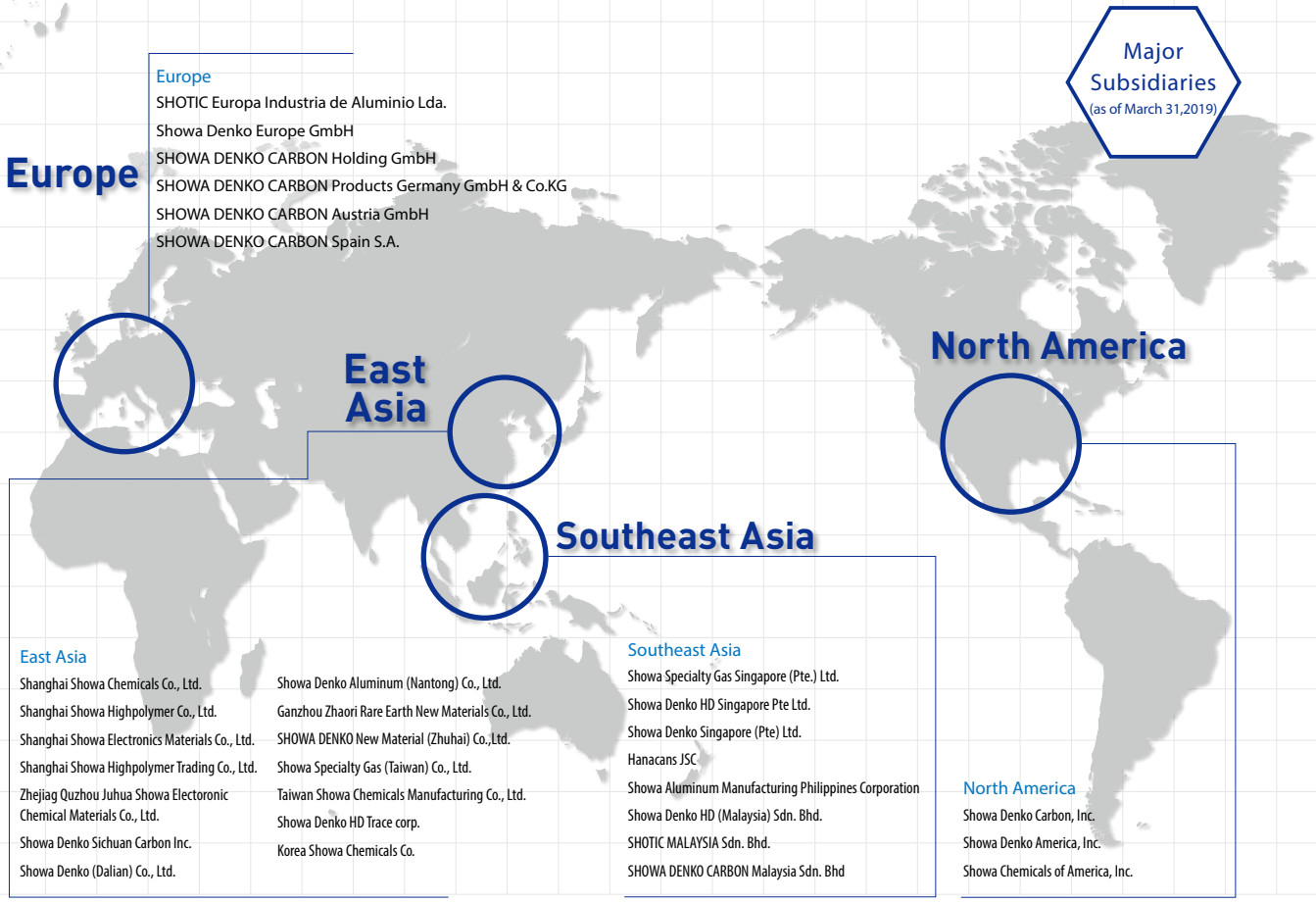
Electronics segment
Showa Denko HD Yamagata K.K.
Showa Denko Packaging Co., Ltd.

Inorganics segment
Showa Denko Ceramics Co., Ltd.
Showa Fine Ceramics Co., Ltd.
Showa Denko Kenso Co., Ltd.

Aluminum segment
Showa Aluminum Can Corp.

Others segment
Shoko Co., Ltd.
Showa Denko Kenzai K.K.

Major Subsidiaries (as of March 31,2019)



Europe

SHOTIC Europa Industria de Aluminio Lda.
Showa Denko Europe GmbH
SHOWA DENKO CARBON Holding GmbH
SHOWA DENKO CARBON Products Germany GmbH & Co.KG
SHOWA DENKO CARBON Austria GmbH
SHOWA DENKO CARBON Spain S.A.

East Asia

Shanghai Showa Chemicals Co., Ltd.
Shanghai Showa Highpolymer Co., Ltd.
Shanghai Showa Electronics Materials Co., Ltd.
Shanghai Showa Highpolymer Trading Co., Ltd.
Zhejiag Quzhou Juhua Showa Electoronic Chemical Materials Co., Ltd.
Showa Denko Sichuan Carbon Inc.
Showa Denko (Dalian) Co., Ltd.
Showa Denko Aluminum (Nantong) Co., Ltd.
Ganzhou Zhaori Rare Earth New Materials Co., Ltd.
SHOWA DENKO New Material (Zhuhai) Co.,Ltd.
Showa Specialty Gas (Taiwan) Co., Ltd.
Taiwan Showa Chemicals Manufacturing Co., Ltd.
Showa Denko HD Trace corp.
Korea Showa Chemicals Co.

Southeast Asia

Showa Specialty Gas Singapore (Pte.) Ltd.
Showa Denko HD Singapore Pte Ltd.
Showa Denko Singapore (Pte) Ltd.
Hanacans JSC
Showa Aluminum Manufacturing Philippines Corporation
Showa Denko HD (Malaysia) Sdn. Bhd.
SHOTIC MALAYSIA Sdn. Bhd.
SHOWA DENKO CARBON Malaysia Sdn. Bhd

North America

Showa Denko Carbon, Inc.
Showa Denko America, Inc.
Showa Chemicals of America, Inc.

(as of March 31,2019)

Governance

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Board of Directors/Audit & Supervisory Board

Board of Directors



Outside Member	Outside Member	Corporate Officers	Director; Managing Corporate Officer	Representative Director, Chairman of the Board	Representative Director, President Chief Executive Officer	Director; Managing Corporate Officer	Corporate Officers	Outside Member
Kozo Isshiki	Masaharu Oshima	Keiichi Kamiguchi	Jun Tanaka	Hideo Ichikawa	Kohei Morikawa	Hidehito Takahashi	Motohiro Takeuchi	Kiyoshi Nishioka

Board of Directors

Representative Director, Chairman of the Board

Hideo Ichikawa

Representative Director, President Chief Executive Officer

Kohei Morikawa

Director; Managing Corporate Officer

Jun Tanaka

Chief Technology Officer (CTO);
Officer in charge of Advanced Battery Materials Division, Institute for Integrated Product Development, Advanced Technology Laboratory, and Corporate R&D ,and Intellectual departments

Hidehito Takahashi

General Manager, Carbon Division;
Officer in charge of Ceramics Division and Coating Materials Department, Yokohama and Shiojiri plants, and Corporate Strategy Department;

Corporate Officers

Keiichi Kamiguchi

Chief Risk Management Officer(CRO);
Officer in charge of Internal Audit, Legal, General Affairs & Human Resources, and Purchasing & SCM departments; Chairman of Security Export Control Committee

Motohiro Takeuchi

Chief Financial Officer(CFO);
Officer in charge of Finance & Accounting and Information Systems departments

Outside Member

Masaharu Oshima

Kiyoshi Nishioka

Kozo Isshiki

Audit & Supervisory Board Members



Setsu Onishi | Hiroyuki Tezuka | Tetsu Moriki | Toshiharu Kato | Kiyomi Saito

Audit & Supervisory Board Members

Outside Member

Tetsu Moriki **Toshiharu Kato** **Hiroyuki Tezuka** **Kiyomi Saito** **Setsu Onishi**

Corporate Officers

Senior Managing Corporate Officer

Jiro Ishikawa

General Manager, HD Division;
Officer in charge of Electronics Materials and Advanced Battery Materials divisions, and Power Semiconductor Project

Managing Execative Officer

Masamichi Yagishita

General Manager, Electronic Chemicals Division;
Officer in charge of Functional Chemicals Division, and Higashinagahara, Tokuyama, Isesaki and Tatsuno plants

Corporate Officer

Kanji Takasaki

Officer in charge of Aluminum Rolled Products, Aluminum Specialty Components, and Aluminum Can divisions, and Oyama and Kitakata plants

Youichi Takeuchi

General Manageer, Kawasaki Plant

Takayuki Sato

General Manager, Electronics Materials Division;
General Manager, Marketing Department, Electronics Materials Division;
Manager, Power Semiconductor Project;
Officer in charge of Chichibu Plant

Taichi Nagai

Oita Complex Representative

Koichi Nishimura

General Manager, Industrial Gas Division;
Officer in charge of Basic Chemicals Division and Kawasaki Plant;
President, Showa Denko Gas Products Co., Ltd.

Masunori Kaiho

General Manager, Production Technology Department;
Officer in charge of Energy & Electricity, SPS Innovation and CSR departments;
Chairman of Safety Measures Committee

Masao Shibuya

General Representative in China;
General Manager, China Office, Corporate Strategy Department;
CEO, Showa Denko (Shanghai) Co., Ltd.

Akihiro Jimbo

General Manager, Basic Chemicals Division

Tetsuo Wada

General Manager, Business Development Center and Institute for Integrated Product Development

Hirotsugu Fukuda

General Manager, Petrochemicals Division;
General Manager, Olefins Department, Petrochemicals Division;
Officer in charge of Oita Complex

Eishi Wakutsu

General Manager, Corporate Strategy Department

(as of July 31, 2019)

Roundtable Meeting of Outside Directors

Business Management and Philosophy to "Touch the Heart and Make Society Better"

Showa Denko has three outside directors: Masaharu Oshima, Kiyoshi Nishioka, and Kozo Isshiki, who newly assumed the position in March 2019. We held a roundtable meeting of these three outside directors, where they expressed opinions informed by their different viewpoints.



Outside Director

Kiyoshi Nishioka

Joined Nippon Steel Corporation (currently Nippon Steel Corporation) in 1977. After serving as Director and General Manager of the Technology Development Planning Department of the company, became special professor at the Research Center for Advanced Science and Technology, The University of Tokyo in 2012. Appointed an adviser for the Center in 2017. Has been in the position of outside director since March 2018, while also teaching at Ehime University as a visiting professor.

Outside Director

Masaharu Oshima

Joined Nippon Telegraph and Telephone Public Corporation (currently Nippon Telegraph and Telephone Corporation) in 1974. Became professor at the Applied Chemistry Department, Graduate School of Engineering, The University of Tokyo in 1995. Assumed the position of outside director in 2015 after serving as chairman of the Japanese Society for Synchrotron Radiation Research, chairman of the Surface Science Society of Japan, and in other important positions. Presently works also as project researcher, Institute for Solid State Physics, The University of Tokyo.

Outside Director

Kozo Isshiki

Joined the Japan Development Bank (currently Development Bank of Japan Inc.) in 1969. After engaging in investment and financing for over 30 years at the government-affiliated financial institution, became Chairman of the Board, Technology Alliance Investment, Ltd. in 2005. Served as outside auditor at Isuzu Motors Limited and in other important positions before becoming outside director of Showa Denko in March 2019.

Corporate Culture and Impression of Showa Denko

Nishioka: I think Showa Denko is a company that is very flat and open. Within the company, colleagues call each other by their names, not by their job titles.
In particular, at Showa Denko I have found Board of Directors meetings to be not overly formal, unlike at many other companies. Showa Denko has established a culture that allows its people to call things as they see them.

Oshima: Yes, indeed. I also feel comfortable discussing issues at the meetings. Chairman Ichikawa worked to create such an open atmosphere when he was president of the company and, as Mr. Nishioka has said, the culture of calling each other by their names seems to have contributed to creating that atmosphere. At Board meetings, I myself can also freely express my opinions based on my experience as a researcher and engineer.

Isshiki: I was in charge of the Showa Denko relationship at the development bank, at which time the company impressed me with its sober atmosphere as a prestigious enterprise. However, upon assuming the position of outside director of Showa Denko in March 2019, I found that the atmosphere had changed substantially. I agree with what you both have said. I have indeed found that the level of the Q&A session held by the Board at its meetings is truly high and I think that Showa Denko could be a model for listed companies in this regard.



> **Being free from excessive formality, it has an established culture of allowing people to call it as they see it.**
>
> **Nishioka**

Oshima: However, it would be even better if we were provided with information about what was discussed as well as what was decided at Management Committee meetings in a balanced manner with regard to the items to be deliberated at Board of Directors meetings. But I might be hated if I start nosing into the Management Committee (laughs).

Isshiki: I agree with you. We need to know both pros and cons in order to have discussions and make well-grounded decisions. I was also impressed to hear top executives utter the word "compliance" repeatedly at Board meetings.

Nishioka: Yes, indeed. They are highly aware of the importance of compliance. However, compliance issues could arise in regard to various aspects. I experienced a series of operations including R&D, manufacturing, and sales at a steel company, and found it necessary to pay attention to everything, including safety, quality, and the environment to ensure compliance in business. Also, all employees need to have compliance awareness as compliance issues could occur anywhere in the company. I expect that the company will devise and implement even more measures to make all employees aware of the top management's commitment to compliance.

Isshiki: Personally, I cannot help thinking that compliance provides the basis for human resource development.
To put it simply, compliance means integrity. Both employees and organizations are expected to take actions based on this value. By acquiring the ability to do this, individual employees could help their company ensure its sustainability, even if the company changes its core business in the future, being influenced by the rapidly changing society.

Relationships with and Contributions to Society

Oshima: As its business philosophy, the Showa Denko Group is committed to "providing products and services that are useful and safe and exceed its customers' expectations" and to "contributing to the sound growth of international society as a responsible corporate citizen." In fact, the graphite electrodes produced by Showa Denko are used in electric steelmaking furnaces, in which iron scraps are recycled into steel. Showa Denko also engages in the recycling of waste plastics into chemical materials and is further adding value to such business. The company is thus implementing an ESG initiative but is not very good at publicizing this fact. I also expect that R&D conducted by the company through open innovation will contribute to the attainment of the SDGs.

Isshiki: Showa Denko now focuses on communicating with society as closely as possible to remain in harmony with it toward the future. The company is striving to meet the social needs identified in this effort by using the power of chemistry, sometimes by fusing it with technologies in other industries. The top management team explains this through various media, and I have the impression that the number of employees supporting that idea is increasing. If it is entrenched across the board as a corporate philosophy, the company will be able to enhance its corporate strength and make even more contributions to society. I hope that this movement will progress toward the future.

Nishioka: The company makes it clear that it values relationships with society in the new medium-term business plan, "The TOP 2021," which was announced in December 2018. Moreover, for the successful implementation of the Group's business philosophy, the company newly set the Group's Mission (meaning of its existence), Vision (its goal), and Value (means to realize the Vision). Specifically, the company defines "Maximization of CUSTOMER Experience" as the Group's shared concept to be called "Value." This means to understand customers in a true sense. Although everyone thinks that they



> **The company can make even more contributions to society if all employees are well aware of the corporate philosophy of maintaining harmony with society and using the power of chemistry to solve issues.**
>
> **Isshiki**

understand their customers, more than a few of them do not truly understand their customers. The value of the "CUSTOMER Experience" shows the company's commitment to deepening relationships with society and providing customers with products that are truly needed by them.

Oshima: I think the Mission, Vision, and Value show the key concepts of the company very clearly. Moreover, all employees seem to be making a concerted effort for the achievement. I also think that "organized chaos," which President Morikawa talks about, shows how Showa Denko should conduct business in this age of great changes.

Isshiki: Compared with when I was dealing with Showa Denko 30 to 40 years ago, it has grown into a different company, which I get a strong sense of when I see its Vision, "KOSEIHA Company," and its corporate message, "Act!" For me, it seems that by using these simple but clear words, the company is giving repeated instructions to make all employees aware of the company's commitments so they that can share them across the board. The company has nurtured among employees a mindset that encourages them to share the commitments. The powerful wording links the company with local communities and brings it to the dimension of social contribution. This is indeed Showa Denko's unique strength, which competitors do not have.

Nishioka: Companies can make contributions to society in any business domain and I hope that Showa Denko will proactively make contributions, giving priority to providing products that are unique and useful to society.

Oshima: In line with the R&D strategies, in which the company upholds the concept of "Fusion," Showa Denko is conducting R&D on a higher level by fostering open innovation in cooperation with universities and other research institutes. I have the impression that the company is implementing this initiative quite skillfully. The R&D department has lots of excellent human resources, who are doing very well. However, the number of R&D staff and the budget are still not sufficient for the company to foster R&D in response to rapid changes in society. I expect that it will focus more on R&D to become an R&D-oriented company.

Showa Denko Group's Mission, Vision and Value

Mission (Showa Denko Group's business philosophy)
Satisfy all stakeholders

Vision (Our goal)
KOSEIHA Company
An aggregate of KOSEIHA Businesses that can maintain high levels of profitability and stability.)

Value (Means to realize Vision)
Maximization of CUSTOMER Experience
Change our business model and offer solutions beyond manufacturer's limits

Corporate message: "Act!"

We shall listen more to customers and further hone our technologies, and shall thereby Act to create products and services that touch "the heart" and Act to offer solutions that make "society" better

Roles of Outside Directors

Isshiki: The major responsibility to be fulfilled by outside directors is to speak on behalf of individual shareholders. Unlike institutional investors, financial institutions, and large shareholders, who have sufficient contact with the company and can express their opinions easily, individual shareholders have only limited opportunities to speak to the company. Outside directors therefore need to speak to the company on behalf of individual shareholders. This is important, and we must keep doing it. As I have already said, we cannot deny the possibility that the company will change its main business in the future. For the sustainable development of the company, I would like to help it employ and retain excellent human resources who can pioneer new fields and become a company with a treasury of human resources.

Nishioka: There are so many things that you cannot see if you are an insider, while outside directors can give advice from external viewpoints, which I regard as my duty. When you are working inside the company, you tend to think and take actions in a routine way. I want to help those inside make new findings and think outside the box. Moreover, we are given opportunities to visit the company's bases across the regions to have dialogue with on-site workers. At a base, I will listen to the workers' opinions, feel out what they think and the level of their interest in various issues, check whether the top management's commitments and corporate philosophy are well understood by them, and give feedback to the management team.

Oshima: As both of you have said, we outside directors monitor, oversee, and give advice on behalf of shareholders from an independent and objective standpoint. This is our mission. I also deem it one of our important roles to develop successors and find future leaders. We support, from an objective viewpoint, the generational change of executive managers, who are tasked with promoting sustainable management. This is an important role expected of us. I would also like to focus on finding candidates for leaders, not limited to top executives, as part of my role as outside director.



One of our missions is to develop the next generation of leaders and support the generational change of leaders.

—— **Oshima**



Corporate Governance

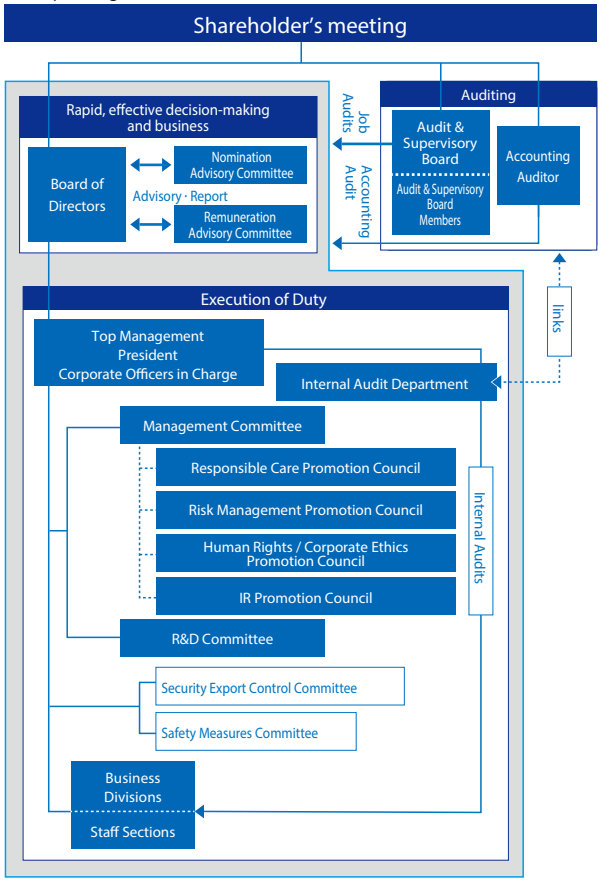
Basic policies

Showa Denko continuously promotes corporate governance to ensure the soundness, effectiveness, and transparency of management, and to contribute enhancing its corporate value, thereby contributing to the sound growth of society and earning its full trust and confidence.

To that end, it is essential for the Company to strengthen relations with its stakeholders, including shareholders, customers, suppliers, community residents, and employees.Based on the above, the Company has clarified its mission in the form of Our Vision and Showa Denko is working hard to realize this Vision.

Showa Denko formulated the Corporate Governance Basic Policies in line with Japan's Corporate Governance Code and discloses the policies at its website.

■ Corporate governance structure



Implementation status of corporate governance measures

Policies and procedures of the Board of Directors in the selection of senior management personnel and the nomination of candidates for Directors and Audit & Supervisory Board Members

Candidates for Directors must possess sufficient knowledge, experience and capabilities to fulfill their obligations as Directors. Senior management personnel are selected by additionally taking into account, among others, their corporate and individual performance. Candidates for the Audit & Supervisory Board Members must possess, in addition to an appropriate level of expertise in the areas of finance and accounting, sufficient knowledge, experience and capabilities to fulfill their obligations as Audit & Supervisory Board Members.

The Nomination Advisory Committee deliberates the nomination of candidates for the afore-mentioned positions and submits recommendations to the Board of Directors. The Committee is an advisory body to the Board of Directors and more than half of its members are independent outside directors.

Explanation regarding the selection of senior management personnel and the nomination of candidates for Directors and Audit & Supervisory Board Members

Reasons why each candidate has been nominated are stated in the Reference Materials for the General Meeting of Shareholders.

Criteria on the independence of outside directors

The Board of Directors has established independence standards for Outside Directors based on independence criteria stipulated by law and the Tokyo Stock Exchange and selects candidates who meet the standards. See the Attachment of Corporate Governance Basic Policies for the independence standards.

Policies and procedures for determining the remuneration of directors, Audit & Supervisory Board members, and corporate officers

Policies

The remuneration of directors (excluding outside directors) and corporate officers shall be composed of base remuneration, short-term performance-linked remuneration, and mid- 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 mid- to long-term performance-linked remuneration shall be paid in line with the stock ownership rules set for directors. Only the base remuneration shall be paid to outside directors and Audit & Supervisory Board members.

Procedures

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 the policies described above, 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.

Remuneration of directors (excluding outside directors) and corporate officers

Breakdown	Outline
Base remuneration	Fixed remuneration decided according to job title and others
Short-term performance-linked remuneration	Performance indicators: Sales, ordinary income and ROA
Mid- to long-term performance-linked remuneration	Stock-based rewards based on the trust system. Total points given before resignation are multiplied by the adjustment index for changes in stock prices to calculate the amount of reward

The amount of remuneration paid to Directors and Audit & Supervisory Board Members in 2018 is as given below.

Governing Body	Total amount of remuneration	Number of persons
Directors (except outside Directors)	¥305 million	6
Audit & Supervisory Board Members (except outside Auditors)	¥56 million	3
Outside Directors and Outside Auditors	¥68 million	8

Overview of Governing Bodies/ Committees/Councils

Governing	Body Members	Meeting frequency
Board of Directors	9 members (Three of them are outside directors.) (As of March 2018) Chairperson: Chairman of the Board	Once or twice a month (The board had 14 meetings in 2018. The average rate of attendance was 100%.)
Management Committee	President, Corporate Officers in Charge, and other Corporate Officers and General Managers of Staff Departmenst as deemed necessaryby the President Chairperson: President	Once a week in principle
Audit & Supervisory Board	Board of Auditors 5 Auditors (Three of them are outside Auditors. (One is female.))	Once or twice a month (The board had 13 meetings in 2018. The average rate of attendance was 100%.)
Nomination Advisory Committee	2 inside directors and 3 outside directors	3 or 4 times a year (The board had 3 meetings in 2018. The average rate of attendance was 100%.)
Remuneration Advisory Committee	2 inside directors, 2 outside directors and 1 outside Auditor	3 or 4 times a year (The board had 4 meetings in 2018. The average rate of attendance was 100%.)

Board of Directors

Showa Denko introduced the corporate officers system to clearly separate the business execution function from the management supervision function. Under the system, a top management team composed of the president and corporate officers makes prompt and dynamic decisions on management. At the same time, the number of Board of Directors members has been substantially reduced while the number of independent outside directors has been kept at two or more for the enhancement of the supervision function.

The Board of Directors decides basic policies of the Company. It also thoroughly discusses and makes decisions regarding matters specified in the Companies Act or the Company's Articles of Incorporation as well as important issues in executing business operations, while promoting prompt and dynamic decision making on management.

We appoint directors with emphasis on the viewpoint of corporate governance, aiming to strengthen the Board of Directors' monitoring and supervisory functions and ensure the propriety of decision making process. We have adopted a management system in which corporate officers dedicate themselves to business execution, which is their primary duty, but do not concurrently serve as directors, in principle. Furthermore, we have abolished the system of officer directors except the Chairman and the President, while strengthening monitoring by Audit & Supervisory Board Members including outside Memberss and mutual supervision among directors.

The term of office of directors is set to one year to ensure a quick and flexible formation of management team corresponding to changes in the business environment.

Board of Auditors

Showa Denko employs an auditor system. The Auditors attend the Board of Directors meetings and other important internal meetings, offering opinions as necessary. They conduct audits on execution of business operations through on-site investigations, interviews with responsible persons, and reference to important documents so as to provide suggestions, advice, and recommendations for securing soundness in management. They also audit group companies in cooperation with auditors of major affiliated companies

Accounting audits

Showa Denko concluded an auditing contract with KPMG AZSA, and this audit corporation performs accounting audits for the Company.

The Accounting Auditor confirms the annual audit plan with the Auditors and reports the audit results to them. The Accounting Auditor and the Auditors also exchange information and views as required, to promote their cooperation.

Management Committee and R&D Committee

The Management Committee, which is chaired by the President, deliberates and decides on matters to be referred to the Board of

Corporate Governance

Directors' meetings and important matters pertaining to overall management of the Company. The decisions are made after deliberations on two occasions. As for the investment issues to be submitted to the Management Committee, risk analysis as well as achievement/progress management are conducted in advance, through preliminary risk reviews and examinations by a relevant task team. The basic business policies including Company's medium-term business plans are decided not only through the deliberation of the Management Committee but also through sufficient examination by all corporate officers.

The R&D Committee deliberates and makes decisions on important issues related to research and development.

Internal Audit Department

We have the Internal Audit Department reporting directly to the President. The Internal Audit Department investigates the overall execution of business including group companies and verifies its accuracy, validity and efficiency. It also investigates and verifies the functional state of management policies, business plans and internal control systems.

The results of internal auditing are also reported to the Auditors for mutual cooperation with Auditors' auditing.

Committees and Promotion Councils

For specific issues to be addressed to ensure appropriate business execution, Showa Denko operates the Security Export Control Committee and Safety Measures Committee, which report directly to the president. Moreover, under the Management Committee chaired by the president, we have the Responsible Care Promotion Council, Risk Management Promotion Council, Human Rights/Corporate Ethics Promotion Council, and IR Promotion Council. Each of these councils conducts surveys and research and holds deliberations regarding the issues entrusted to them.

Responsible Care Promotion Council

The Showa Denko Group conducts activities based on the Responsible Care Action Guidelines, which set forth the Group's management policies related to the environment, safety and health. The Responsible Care Promotion Council conducts preliminary discussions concerning important issues around Responsible Care.

These issues are reported to and approved by the Management Committee (Menbers: President, Corporate Officers in Charge, and other Corporate Officers and General Managers of Staff Departments as deemed necessary by the President. Chairperson: President).

Risk Management Promotion Council

We have established a risk management system around the CRO (Chief Risk Officer). The Risk Management Promotion Council conducts preliminary deliberations on important risk-related matters.

Human Rights/Corporate Ethics Promotion Council

The Showa Denko Group considers "compliance with social justice and corporate ethical norms" to be one of its most important management priorities. It regards human rights as the core theme of corporate ethics. The Human Rights/Corporate Ethics Promotion Council chaired by the CRO determines the medium- to long-term principles and makes annual plans for the activities related to human rights and corporate ethics, with an eye to raising awareness among all Group employees.

IR Promotion Council

The IR Promotion Council is chaired by the CFO. The Council examines the comprehensive measures and basic plans for IR, centrally manages the important factual data, such as the financial results, in line with the Tokyo Stock Exchange's timely disclosure rules, and ensures the appropriate disclosure of important facts.

Showa Denko conducts information disclosure and IR activities to help shareholders and investors deepen their understanding of its corporate management, business activities, and strategies so that they can evaluate its corporate value in an appropriate manner. To this end, we work to communicate proactively with shareholders and investors, improve management transparency, and strive to disclose information concerning Showa Denko in an easy-to-understand, fair, timely, and accurate manner. In April 2018, the Revised Financial Instruments and Exchange Act was enforced in Japan, and to ensure compliance with the fair disclosure rules of this law, we revised our disclosure policy and made it public on our website.

Security export control Committee

For all export products, the Security Export Control Committee determines whether or not government permission is required, investigates customers, and makes a decision on whether to enter into each transaction through systematized procedures.

Safety Measures Committee

The Safety Measures Committee examines comprehensive measures and basic plans for the environment, safety and health, and offers relevant opinions to the related agencies.

Our Code of Conduct and Its Practical Guide

The Showa Denko Group formulated Our Code of Conduct and Its Practical Guide in January 2012 to show individual employees what to keep in mind and how to behave for the sustainable development of the Group and the international community.

We have published this document also in English, Chinese, Korean, Vietnamese, Indonesian, Malay, and Portuguese to encourage all Group employees across the globe to fulfill their responsibilities based on shared values and criteria as members of the corporate group.

Risk Management

Basic policies

The Showa Denko Group is working to improve its risk management system and implementing risk reduction measures, deeming it essential to ensure risk management as a precondition to earn trust from customers on a continual basis.

Risk management system

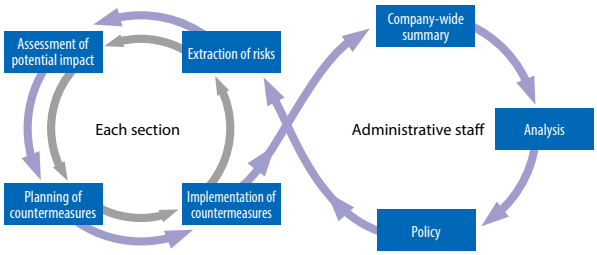
The Showa Denko Group has a risk management system led by the Chief Risk Officer (CRO), and the Group's Risk Management Promotion Council deliberates important risk management-related issues. Moreover, through the "risk inventory" activity, we raise employees' awareness of the importance of risk management and execute a risk management-related PDCA cycle for the appropriate management of risks related to the Group's activities. In the event that we face a crisis that could threaten the very existence of the company, we will establish crisis headquarters led by the president. The Management Committee discusses the Group's risk management situation and checks the details as necessary, while the Board of Directors checks whether the risk management process functions effectively at its meetings.

"Risk inventory" activity

We conduct the "risk inventory" activity as a cyclical risk management activity to identify and assess the risks related to the Showa Denko Group's activities, visualize the assessed risks to prevent their materialization, and manage the materialized risks appropriately.

All 96 of the Group's sites are included in the risk management target and the risks related to their activities are identified by department and according to the classification criteria as shown below. For each of the identified risks, we assess the influence that might be exerted if the risk is materialized, register the assessment results with the company-wide risk management system, then plan measures to reduce the identified risks, and implement them in a planned manner. Progress with these activities is reported by risk managers to top managers, including the heads of the business divisions and each site. We also execute a PDCA cycle to improve the measures and risk assessments. Risk assessors are selected by risk type from among administrative staff members of the head office, and for the risks assessed as having the possibility of causing serious loss to the company ("top risks"), the risk assessors in charge evaluate the appropriateness of the measures taken for the risks and give necessary advice. In addition, for the "top risks," we provide education and training, carry out on-site inspections, and give instructions on countermeasures.

■ Cycle of the risk inventory activity



Risk classification

①Accidents 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

②Risks 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
Violation of laws concerning environment, chemical substances, security and safety
Defamation, violation of privacy
Crimes committed by employees
Bribery

③Risks related to human resources and labor
Human rights
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

④Information management
Information leaks
System failures
Problems involving media, rumors, whistle blowing
Commercial software
Management of login ID

⑤Risks related to management and business
Stocks and corporate bonds
Investments
Finance and accounting

⑥Risks related to supply chains
Inventory, assets
Procurement
Business

⑦Risks related to external environment
Nation, region community
Industry

Loss classification

Loss of social credibility
Damage to corporate reputation
Loss of brand values
Damage to relationship of trust with concerned governmental agencies
Damage to relationship of trust with local communities

Loss of human resources
Business-related Death, Permanent disorders
Non-permanent disorders, injuries and illnesses
Damage to mental health
Outflow of human resources
Failure in human resource security
Additional workloads
Lower productivity

Loss of financial assets
Damage to facilities
Suspension of operations
Loss of business opportunities
Damage compensation
Lawsuit costs
Costs of environmental measures
Increase in production costs
Surcharges

Activities in 2018

The Showa Denko Group launched the "risk inventory" activity 12 years ago. Over the years we have steadily implemented measures to reduce risks, including measures to prepare against natural disasters and prevent information security breaches. Each year we identify the risks for which measures should be enhanced and conduct the risk inventory activity, thereby increasing our risk sensitivity to ensure appropriate information management and compliance in consideration of recent social situations. We also analyzed the 9,045 cases registered with the Group's risk management system by risk type, by site, and by job function. We then made a report about the analysis results as well as about the measures taken against the top risks and shared the report across the Group.

Through the "risk inventory" activity, we foster comprehensive risk management for a range of issues, including quality management, management of chemical substances, climate change, intellectual property, prevention of corruption, occupational safety, and supply chain. At the same time, we ensure that the effectiveness of risk management is evaluated by top management. In particular, for our supply chain, our business divisions and sites are cooperating with each other to ensure early recovery from possible emergencies, such as disasters, and to ensure business continuity.

Compliance

Basic policies

The Showa Denko Group believes that compliance both provides the basis of its business continuity and is essential for the achievement of its vision. Accordingly, we are conducting a range of activities to ensure compliance with social norms and corporate ethics as well as laws and regulations.

Activities in 2018

1. Compliance with anti-bribery laws and regulations, and prevention of corruption

The Showa Denko Group is implementing drastic measures to comply with anti-bribery laws and regulations enforced in each country, thereby avoiding any activities that could lead to the formation of corrupt relationships between the Group and government officials and others, including bribery and the compulsion, offer, and inducement to bribe, which are acts that prevent the sustainable growth of the international community. Specifically, we held an e-learning seminar to provide basic knowledge about bribery in May 2018 and a total of 444 people attended.

Moreover, in order to clearly state the Group's basic anti-bribery policy both internally and externally and make a strong commitment to adhering to the policy, we formulated the Showa Denko Group's Global Anti-Bribery Policy in January 2019.

Also, for the provision of benefits, exchange/entertainment opportunities, and gifts that do not constitute bribery, we conduct sufficient examinations as to the reason why we need to provide them, recognizing that providing them for the purpose of making profit unfairly may lead to corruption.

Specifically, we prohibit in our in-house rules the provision and receipt of benefits, exchange/entertainment opportunities, and gifts that could be perceived as being intended to produce unfair profit. We also set an upper limit on the amount of money that can be spent for the purpose of socializing, thereby preventing the provision of excessive benefits. We have also set an approval process for the provision of such benefits. In addition to implementing the rules and the process internally, we have obtained support and cooperation from our suppliers by informing them of the rules through the CSR Procurement Guidelines.

2. Compliance with competition laws

Fair and open competition is indispensable for the sustainable development of the international community. Accordingly, the Showa Denko Group is implementing drastic measures to comply with competition laws, which are designed to ensure fair and open competition, in each country.

Specifically, we formulated our own anti-cartel rules in May 2010 and have been implementing the rules to control cartel risks appropriately in our daily business operations.

Since 1999 we have also been carrying out internal audits to check for illegal sales activities to ensure compliance with competition laws and reported the results to top management. We also published a range of guidelines, including the handbook on antimonopoly laws for sales personnel, the Antitrust Compliance Guideline, and the Compliance Program of EU Competition Laws, with an eye to raising employees' compliance awareness regarding competition laws across the Group. Furthermore, since 2014 we have been holding an annual seminar on competition laws for the Group's sales personnel (including national staff of Group companies outside Japan), inviting external experts in competition law to serve as lecturers. A total of 631 employees have participated in the event, held at five of our bases in Japan and overseas.

3. Activities for Corporate Ethics Month

The Showa Denko Group sets every January as Corporate Ethics Month.

In January 2018, all directors and managers of the Group, including those of Group companies outside Japan, each signed a written pledge to comply with the Code of Conduct and submitted it to the Group CEO. Subsequently, in May of the same year, all Group employees examined their daily behaviors in reference to Our Code of Conduct and Its Practical Guide and discussed the related issues at their workplaces.

Information Disclosure and Communication

4. Corporate Ethics Hotline

We operate the Corporate Ethics Hotline so as to be able to detect from across the Showa Denko Group any incidents of noncompliance or unfair and other behaviors that contravene corporate ethical standards at an early stage in order to resolve them. Employees can make a report via Showa Denko's website and intranet as well as through the external law firm designated by the company. Not only Group employees but also all other stakeholders, including suppliers and local residents, can make reports to the Group through the hotline. For national staff of Group companies outside Japan, we have also been providing a multilingual hotline service (external service in 12 languages) since April 2018.

The hotline service can be used anonymously, and we clearly state that we respect the privacy of service users and prohibit the disadvantageous treatment of users by their companies.

The secretariat of the Corporate Ethics Hotline received information about all the reports made to the hotline in 2018 for prompt and careful investigation of the details, and corrective measures were swiftly taken as necessary.

■ Number of requests for consultation received by the Corporate Ethics Hotline

	FY2014	FY2015	FY2016	FY2017	FY2018
Sexual harassment/ Power harassment	–	34	15	26	24
Violation of compliance	–	2	1	0	2
Others	–	14	15	19	28
Total	44	50	31	45	54
Number of staff members dismissed due to noncompliance with the anti-bribery/ corruption policies	–	0	0	0	0

*Including anonymous reports and requests and those made to other contacts (data for Group companies in Japan and some outside the country)

*For human rights, please see page 67.

Basic policies

The Showa Denko Group aims to be a company that is trusted and rated highly by all stakeholders by fulfilling its social responsibilities. To this end, we will clarify our responsibilities to stakeholders, engage in dialogue with them to identify what they expect from the Group as well as the challenges to be met, and incorporate the findings in our business activities.



Activities in 2018

Communicated with shareholders and investors

We position the general meeting of shareholders as the golden opportunity for communication with shareholders. In order for more shareholders to exercise their voting rights, we enabled the shareholders who were not able to attend the meeting to exercise their votes by means of mail or the Internet.

At the general meeting of shareholders, we endeavored to offer easy-to-understand answers to the questions raised by shareholders. We also provided a display space to introduce some of the Group's products and technologies.

For institutional investors and securities analysts in Japan, we hold a briefing session on our financial results on a quarterly basis. In addition, in 2018, we held a meeting to brief them on the new medium-term business plan, "The TOP 2021," which we launched in 2019. After the end of this meeting we accepted questions from individual participants to provide them with more detailed information.

For the promotion of fair disclosure practices, we revised our disclosure policy in 2018 and worked to disclose information in Japanese and English concurrently for overseas institutional investors and shareholders. The president and CFO also visited Europe,

Information Disclosure and Communication

North America, and Asia to directly explain our business results and management plans to local investors and shareholders.

For individual investors in Japan, we held briefing sessions more frequently at our facilities and at the branches of securities companies in major cities throughout the country, from Sapporo to Fukuoka.

In response to the revision of the Japanese Financial Instruments and Exchange Act, we revised our disclosure policy and clarified how to promote fair disclosure.

Moreover, we expanded the online information dispatch functions, provided the financial results and other IR news email service, and posted a summary of major financial performance data and related explanations on the website.



Briefing session for individual investors

TOPIC

Recognition of our IR activities

Showa Denko was rated highly in the selection of Awards for Excellence in Corporate Disclosure by securities analysts of the Securities Analysts Association of Japan. Moreover, our IR site was named an excellent website by Nikko Investor Relations in its Website Quality Ranking and received the Internet IR Excellence Award from Daiwa Investor Relations and the silver prize in the Gomez IR Site Ranking from Morningstar.

■ ESG indexes adopting Showa Denko

Member of SNAM Sustainability Index 2019 | FTSE4Good | FTSE Blossom Japan | MSCI Japan ESG Select Leaders Index | MSCI 2019 Constituent MSCI ESG Leaders Indexes

Local communities and authorities

The Showa Denko Group strives to ensure that local communities and authorities have confidence in the safety and stability of its operations.

We also issue a newsletter on activities conducted by our bases, organize plant tours for local residents, and give support to local cultural and sports promotion as a means of fostering communication with local communities.

Customers

The Showa Denko Group strives to provide customers with safe and reliable products and services that meet their needs, thereby giving them satisfaction and securing their ongoing patronage.

Business partners

The Showa Denko Group strives to earn even more trust from its business partners to maintain win-win relationships with them.

Employees and their families

The Showa Denko Group dispatches a range of information to Group employees.

In addition, the Group fosters good communication with employees by conducting employee awareness surveys and operating the Corporate Ethics Hotline, with a view to providing them with workplaces where they can feel satisfaction and becoming a corporate group that they can be proud of.

We also organize tours of Group facilities for employees' families to help them deepen their understanding of the Group. Furthermore, in 2018, we published a special corporate brochure for the families of employees.

TOPIC

Aluminum can recycling activity

The Showa Denko Group's aluminum can collection activity started in 1972. In 2018, the participation rate of group employees was 97.2%. The Showa Denko Group is recycling aluminum cans. The cans collected by employees are purchased by their companies and then sold to Showa Aluminum Can Recycling Center, Ltd., a Group company, and others. Proceeds from the activity are donated to various facilities and organizations located in the regions where the companies are operating.



Making donation(Showa Denko Ceramics Co., Ltd. Toyama plant)

*Please also read our CSR news posted on our website.

Relationship with Business Partners

CSR procurement

Basic policies

Showa Denko fosters CSR procurement, deeming it important to give consideration to society and the environment based on the following policies throughout its supply chain from the procurement of materials to the manufacture and sale of its products.

1) We will take a comprehensive approach in selecting most suitable supplier partners based upon economic rationality by taking into consideration quality, price, delivery period, credibility of management, safety, services, technological competence and attention to environment and society.
2) In selecting our supplier partners, we have an open-door policy for business opportunities with sincerity, fairness and honesty, disregarding the nationality, past records of transaction and the corporate group relationship of the candidate companies.
3) Our purchasing activities shall be in compliance with laws and regulations, as well as our internal rules.

Activities in 2018

Our CSR procurement aims to mutually improve the corporate value of both our business partners and Showa Denko by sharing with them and requesting their compliance with the Showa Denko Group CSR Procurement Guidelines . The guidelines provide specific CSR activities that we request our business partners to conduct. In order to confirm their compliance with the guidelines, in 2016 we continued performing three activities: asking business partners to assess their own CSR activities ("self-assessments"), visiting them for inspection purposes ("CSR visits"), and doing follow-up checks on their improvement ("follow-up").

We also spread these CSR procurement activities to our Group companies in Japan and carried out self-assessment surveys of the business partners of five Group companies, with the agreement of those Group companies. Moreover, we created English and Chinese versions of our self-assessment questionnaires for business partners outside Japan and began asking them to fill them in.

WEB **Showa Denko Group CSR Procurement Guidelines**

http://www.sdk.co.jp/english/about/ purchase/csr.html

Self-assessments

We ask our business partners to fill out self-assessment questionnaires to check how well they meet the Showa Denko Group CSR Procurement Guidelines. The survey is conducted once every three years in the case of major business partners and at the time of starting transactions in the case of new business partners.

We changed the self-assessment questionnaire items in 2018, and now our business partners perform a self-assessment regarding the following nine items both within and outside Japan: promotion of corporate social responsibility (CSR) as a whole; quality & product safety; corporate ethics, compliance and fair trade; environmental preservation; safety & health of worksites; human rights & labor; information security; social contributions; and sustainable procurement.

We carefully check every response and the analyzed results are fed back to the respondents for continuous improvement

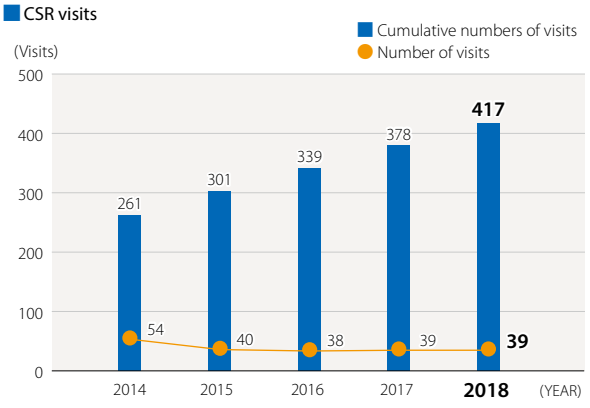
■ Self-assessments average



CSR visits

The objective of CSR visits is to check that CSR activities are conducted properly by our business partners at their actual sites. Purchasing personnel from each plant visit about 40 business partners every year to confirm that their responses to the self-assessment questionnaire are true and correct and to interview them to communicate our policies to and gather necessary information from them.

■ CSR visits



Follow up

If any area needing improvement is found at any business partner as a result of a self-assessment and/or CSR visit, we work closely together with the partner for improvement to ensure that they will meet the guidelines.

Relationship with Business Partners

Addressing Conflict Minerals

Purchasing minerals (tin, tantalum, tungsten, and gold) from Congo and its neighboring countries is considered as a large international problem because you fund local armed groups, consequently have a part in local conflicts, and cause violation of human rights and environmental destruction by purchasing them. The Showa Denko Group incorporates measures to deal with the issue of conflict minerals in the CSR Procurement Guidelines and checks for the procurement of conflict minerals by suppliers to avoid purchasing and using any such minerals.

"White Logistics" movement

"White Logistics" is a movement promoted by the Japanese government in response to the shortage of truck drivers and is intended to increase the productivity of truck transportation, enhance the efficiency of logistics operations, and improve the working environment for truck drivers and other workers.

"White Logistics" can be said to be 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 this movement, Showa Denko made a declaration to voluntarily take actions for sustainable logistics in May 2019 and has since been acting in accordance with the declaration.

CSR

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CSR Management

Message from CSR



Contributing to the creation of a sustainable society by capitalizing on the Group's strengths

Keiich Kamiguchi
Corporete Officer
Officer in charge of CSR & General Affairs

Revision of the CSR Policy

The Showa Denko Group has been working to become a company contributing to the creation of a society where affluence and sustainability are harmonized, deeming the fulfillment of its CSR as a fundamental requirement for the management of the Group. Based on this recognition, we have been delivering products and services to meet the needs of society. This May, we revised the Showa Denko Group's CSR Policy to show, to our stakeholders, the approach that we are taking to make contributions to the creation of a sustainable society on a long-term basis and the priority issues that we should tackle to this end. In the new CSR Policy, we clearly state that we will contribute to the achievement of the Sustainable Development Goals (SDGs) through our business operations. We will sincerely face the issues to be overcome for our sustainable future and proactively work to meet the challenges by capitalizing on the Group's strengths.

Safety and compliance provide the basis for our business activities

The Showa Denko Group regards safety and compliance as the basis for its business activities and deems it essential to ensure both for the Group to become a social contribution company as upheld in the CSR Policy.

The Active Safety activities*, which we launched in 2007, have already taken root in the Group. We will further enhance the activities to prevent occupational accidents, equipment accidents and environmental problems. Also, for the Group to ensure compliance and steadily develop its business activities in a sincere manner, we will further enhance our awareness-raising and educational activities for corporate ethics, while updating the related in-house rules.

*Active Safety activities: The Showa Denko Group's unique activities in which we analyze past accidents and problems, and take measures to prevent their recurrence.

Promoting dialogue with stakeholders

The Showa Denko Group conducts CSR activities to continue to be a sustainable company and make contributions to the sustainability of the international community. Specifically, we will work on what needs to be done now from medium- to long-term viewpoints and share information about the activities both inside and outside the company. We need to foster dialogues with stakeholders to identify social needs appropriately and ensure that we do not take a dogmatic approach in our thinking. We will continue to attribute importance to communicating with stakeholders and increase opportunities to open dialogues with them. We will proactively conduct CSR activities, receiving inputs for improvements from our stakeholders, thereby boosting our corporate value.

CSR Policy

Showa Denko Group's CSR Policy (May 2019)

We at the Showa Denko Group will aim to make ourselves a social contribution company that satisfies all stakeholders by contributing to solving issues concerning SDGs through its business activities, and ensuring all employees' conduct conforming to "Our Code of Conduct."

Main theme

"Creation of economic and social value through deepening of risk management on the basis of safety and compliance, and through creation of business opportunities on the basis of CSR communication"

Contribution to creation of society where affluence and sustainability are harmonized through effective use of technologies, products and services	Tackling environmental issues in order to realize sustainable society and as a mission of manufacturer	Development of human resources that contribute to sustainable growth of international society and the Showa Denko Group

We revised the CSR Policy in 2019.

The Showa Denko Group has long been upholding contribution to the sound development of the international community as its management philosophy and its basic corporate attitude. We believe that contributing to the achievement of the SDGs through our business operations is what we should do across the Group. CSR activities are activities to be conducted with the participation of all members, and employees are expected to play the leading role for these activities. Our Code of Conduct and Its Practical Guide shows the guidelines for our CSR activities, and each member is required to recognize the importance of CSR and take actions accordingly.

As the main theme for the Policy, we have upheld, "Creation of economic and social value through deepening of risk management on the basis of safety and compliance, and through creation of business opportunities on the basis of CSR communication." We will work to make use of the precious information gained through the exchange of opinions with our stakeholders to promote the theme-related measures across the company.

CSR Promotion Framework

CSR activity-related policies, targets, and plans are deliberated by the Management Committee composed of the president, corporate officers, and Audit & Supervisory Board members and are then finalized by the Board of Directors, which also supervises risk management and compliance issues, the progress of contribution to the SDGs and of measures for environmental problems including climate change.

The Responsible Care Promotion Council, Risk Management Promotion Council, Human Rights/Corporate Ethics Promotion Council, and the IR Promotion Council make plans and proposals about individual issues related to CSR. Among these issues, priority issues are incorporated into the comprehensive CSR plan to be deliberated by the Management Committee. The results are reported to the Board of Directors for supervision of the related activities by the Board.

Moreover, our divisions and plants conduct Responsible Care, risk management, human rights and corporate ethics, and compliance activities by receiving support from staff of the Responsible Care, CSR and General Affairs, Human Resources, and other departments.

For contribution to SDGs, the disclosure of climate change-related information in response to the activities of the TCFD, and other issues to be tackled across the organization, we are conducting cross-functional (CF) activities.

■ CSR promotion Framework



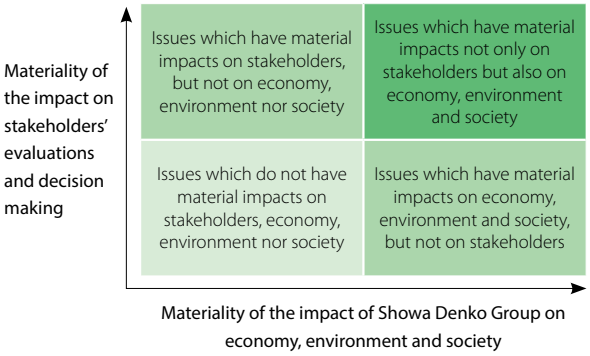
CSR Management

Materiality of issues of the Showa Denko Group

Aiming to contribute to realization of sustainable society, the Showa Denko Group analyzes materiality of impacts of its business activities on stakeholders, economy, society and environment, and selects 14 material issues.

Moreover, in order to clarify, both internally and externally, the social tasks to be prioritized by the Group, we have classified the 14 material issues into three core task groups, and then set the medium- to long-term policy for each of the tasks. We will also set specific KPIs for each of the material issues and disclose the indicators when they are decided. By implementing initiatives based on the policies and KPIs, we aim to make achievements in a steady manner.

Determining Materiality



Core tasks and materiality

Core tasks	Medium- to long-term policy	Materiality
Contribution to achievement of SDGs through business activities	By making effective use of the Group's products, technologies, and services, we will contribute to the creation of a society where affluence and sustainability are harmonized. · Promote R&D in consideration of the SDGs · Monitor contribution to the SDGs made through business activities and announce the results	· Provision of products, technologies and services · Access to Essential Services · Consumer Safety and Health Protection · Participation in Community Activities
Tackling environmental issues	We will conduct Responsible Care activities with a strong focus on "responsibilities as a manufacturer and as a user," thereby contributing to the solution of global environmental problems. · Reduce GHG emissions · Foster 3Rs to reduce waste generation · Reduce the discharge of chemical substances	· Prevention of Pollution · Use of sustainable resources · Measures to climate change
Establishment of sustainable methods for human resource development and improvement in working environment	We will develop diverse human resources made up of people who can achieve growth with their company and contribute to a sustainable society, while also providing individual employees with workplaces where they can work with peace of mind and in good health. · Develop employees and support their growth · Promote diversity	· Development of Human Resources · Creating a comfortable workplace · Equipment safety · Occupational Health and Safety · Thorough corporate ethics · Protection of intellectual property · Decision-making process, structure

* We will disclose the KPIs for the material issues on our official website when they are decided.

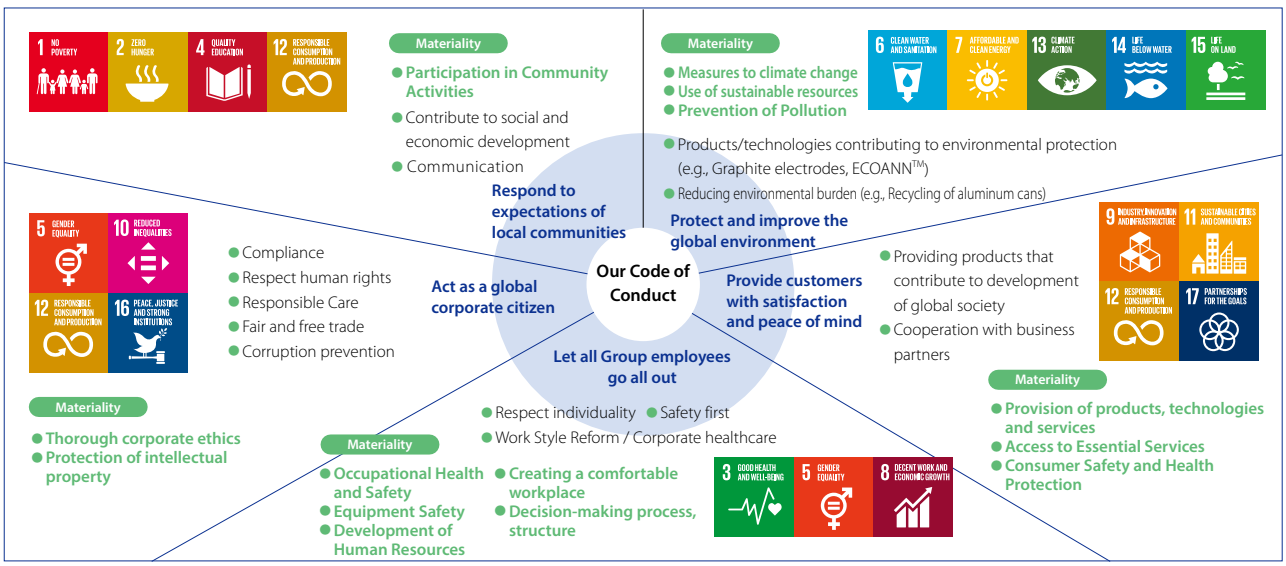
Showa Denko Group's activities to achieve SDGs

The Showa Denko Group promises in "Our Code of Conduct" as follows: "We will act with integrity as a responsible citizen of the international society," "will provide our customers with satisfaction and safety," "will develop corporate culture that helps every member of the Group to fully display his/her ability," "will meet the expectations of local communities," and "will make vigorous efforts to maintain and improve the global environment."

These promises are in accord with the ideas proposed in the Sustainable Development Goals (SDGs), which are universal goals to be attained by 2030 for all people and include eradicating all forms of poverty, fighting against unfairness, and combating climate change to "leave no one behind."

The Group will conduct business operations by linking the Code of Conduct and its material issues with the SDGs.

Connect SDGs and Our Code of Conduct, and promote integrated Group management



Contribution to achievement of SDGs through business activities

The Showa Denko Group states in the Group's CSR Policy that it will aim to make itself a social contribution company that satisfies all stakeholders by contributing to solving issues concerning SDGs through its business activities, and ensuring all employees' conduct conforming to "Our Code of Conduct." We have thereby made a clear commitment to contributing to the SDGs through our business as a social responsibility of the Group.

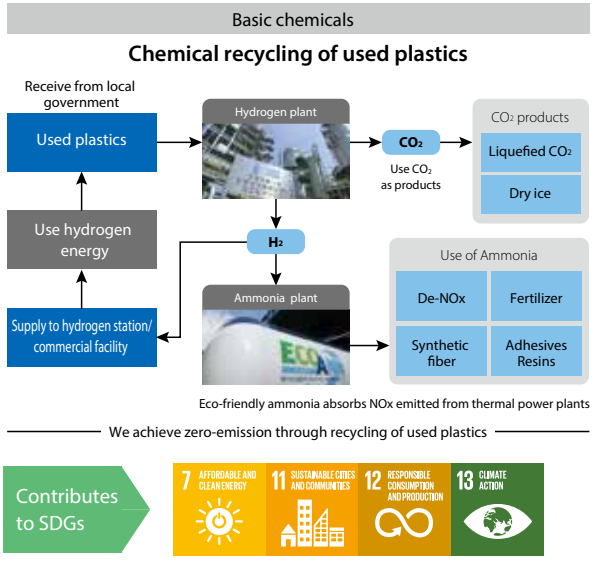
As part of the activities to fulfill this commitment, we began selecting, from among our products and services, those with which we expect to contribute to solving issues for the SDGs. In 2019, we selected chemical recycling of used plastics and graphite electrodes. We will foster R&D in consideration of the SDGs in our effort to contribute to the creation of a society where affluence and sustainability are harmonized through our business activities.

Products and services contributing to the SDGs

Chemical recycling of used plastics

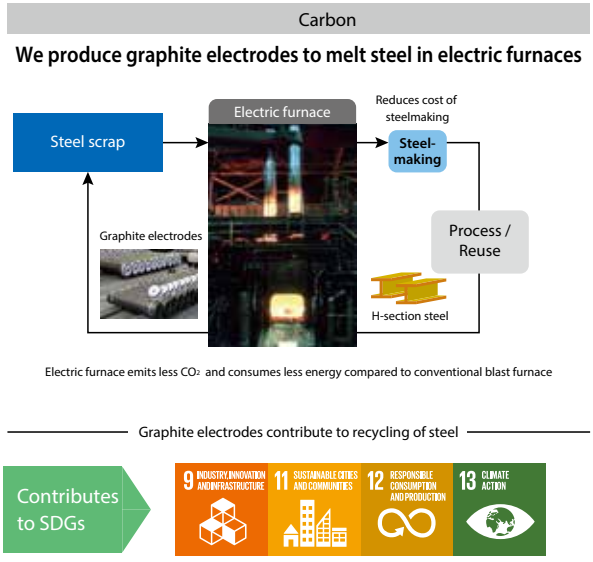
The Kawasaki Plant of Showa Denko K.K. has been chemically recycling used plastics into hydrogen since 2003 in order to ensure the stable supply of hydrogen as a material for ammonia. Ammonia is mainly used for the denitration of air pollutants emitted from thermal power plants and other facilities, and as a material for synthetic fibers/resins and fertilizers.

By manufacturing hydrogen through the chemical recycling process, in which we minimize the use of fossil fuels and recycle by-products such as carbon dioxide, we substantially reduce the environmental impact in comparison to the conventional hydrogen manufacturing method.



Graphite electrodes

The Showa Denko Group integrated the electrode graphite business of SGL GE of Germany in 2017, becoming the world's top graphite electrode manufacturer. Graphite electrodes represent an indispensable component of electric furnaces in which iron scraps are recycled into steel. Compared with making steel from iron ore using a blast furnace, melting iron scraps and recycling them into steel using an electric furnace is much more energy efficient and also helps reduce CO_2 emissions substantially.



TOPIC

Awareness-raising activity

In order to help all Group employees to understand its products and contribute to the SDGs, we distributed a Japanese/English/Chinese summary of the relationships between the Group's products and the SDGs to each employee.



Responsible Care

Management

Responsible Care Action Guidelines

Showa Denko established the "Responsible Care Action Guidelines" in March 1995. These guidelines stipulate management policies related to the environment, safety, and health. Our Group promotes activities based on these action guidelines.

In addition, we also signed the Responsible Care Global Charter in 2005, pledging our support for and implementation of the charter When the RC Charter was amended in 2014, we re-signed, making clear our willingness to promote RC activities through global collaboration.



Responsible Care Global Charter Signatory Certificate

Responsible Care Action Guidelines (Showa Denko Group Action Guidelines)

1. Throughout the entire life cycle of products, we shall make our best efforts to review and improve business activities continuously from the view points of ensuring safety & health and protecting the environment.
2. We shall make our best efforts towards sustainable development by harmonizing our production activities with the global environment, not only through conventional approaches to environmental preservation, but also through promotion of changing raw materials, energy conservation, waste reduction and recycling, reductions in the release of chemical substances, etc.
3. In the development of new products and businesses and in the establishment, enlargement, and renovation of facilities, we shall undertake our best efforts to ensure safety and health and to protect the environment.
4. We shall promote R&D and develop technologies that will contribute to the improvement of safety and health and to the protection of the environment. We shall also promote the marketing of alternative or new products.
5. We shall enrich risk assessments and risk management concerning the effects of the products and materials we handle on safety, health, and the environment, and we shall provide information on the safe use and handling of our products to our stakeholders as well.
6. In overseas business activities, technology transfer, and international trading of chemical products, we shall give full consideration to ensuring safety and health, and protecting the environment.
7. We shall comply with international rules, domestic laws and regulations, and make our best efforts to cooperate with the relevant international organizations, domestic and foreign administrative bodies, etc.
8. We shall participate proactively in various activities related to the ensuring of safety & health and environmental protection, and make our best efforts to communicate with society to achieve better understanding and trust.

Responsible Care promotion system

At Showa Denko, the Responsible Care (RC) Promotion Council is placed under the Management Committee, which is chaired by the chairman of the company and composed of the president, corporate officers in charge, and other corporate officers and heads of the administrative departments whose presence on the committee is deemed necessary by the president. The RC Promotion Council undertakes preliminary deliberations on important issues concerning RC, such as environmental management, global warming, industrial waste, discharge of chemical substances, water resource-related risks, equipment safety, occupational health and safety, health management, safety of chemicals, and quality assurance. The deliberation results are reported to the Management Committee for discussion, and the results of that discussion are then reported to the Board of Directors.

As of January 2019, we are promoting Responsible Care at our headquarters, 13 business divisions, 15 workplaces, 3 branches, the Institute for Integrated Product Development and 16 major Group companies.

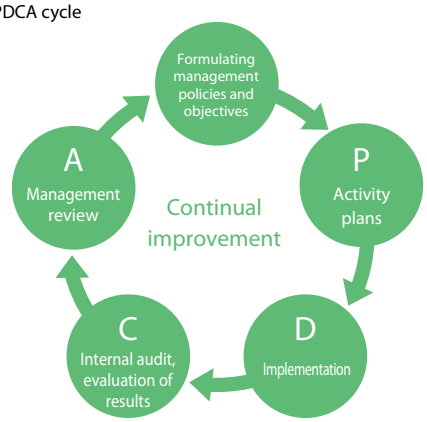
At overseas Group companies (manufacturing) as well, we have identified achievements relating to Responsible Care and provided local guidance to expand the target scope.

* Group Companies
Tsurusaki Kyodo Doryoku K.K. Showa Denko Ceramics Co., Ltd., Showa Denko Packaging Co., Ltd., Showa Denko Sakai Aluminum Co.,Ltd., Showa Denko Kitakata Aluminum, Showa Aluminum Can Corp., Chichibu Showa Denko, Showa Denko Electronics K.K. Union Showa K.K. Niigata Showa K.K. Showa Aluminum Can Recycling Center, HI-PACK Co., LTD., Showa Denko Gas Products Co., Ltd., Clean-S Showa Co., Ltd. Shinshu Showa K.K. and Frontier Carbon Corp

The PDCA cycle

The Showa Denko Group works to achieve continuous improvement in its 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).

■ The PDCA cycle



Education system

The Showa Denko Group, employees receive Responsible Care education that focuses on occupational safety, environment preservation and compliance when they join the company or are promoted. Internal auditors for environmental management systems and occupational safety and health management systems are also provided with annual training.

The following table shows the occupational safety-related collective training held by the head office. Participants in the training make use of what they have learned in the training in the safety activities conducted at their sites.



Responsible Care training for new manufacturing section managers
(Higashinagahara Plant Showa Denko K.K.)

■ Number of participants in the occupational health and safety training held by the head office in 2018

Date	Name of training	Target	No. of participants
Febrary	RC training for new environment & safety managers	Those who are new to the post	14
April	RC training for new employees	New employees	55
June	Labor-management RC training	Manufacturing section managers of the sites/Those in charge of RC at each branch of the labor union	43
September	Exchange meeting on safety for engineering departments	Engineering (maintenance) section managers of the sites	31
October	RC training for new manufacturing section managers, etc.	Those who are new to the post	19

* In addition, we provide mid-career employees with appropriate safety education as necessary.

Auditing structure

Showa Denko and its major Group companies conduct audits as described below for their worksites to assess and improve their Responsible Care activities.

Self-audit

Workplaces of Showa Denko and its major Group companies evaluate their own Responsible Care systems and implementation statuses based on a checklist, so as to reflect the results in the following year's targets and action plans in order to move forward with continuous improvement.

Worksite auditing

The Environment & Safety Office of the RC Department audits worksites to both, make evaluations and improvements regarding Responsible Care at Showa Denko and its major group companies. The Management Committee deliberates these results to reflect them in the policies, goals and plans of the entire company and Group companies. In 2018, we audited 32 workplaces (including our headquarters, branch offices and business divisions).

Management system

The Showa Denko Group continues improving its management system through receiving and maintaining certification of conformity to management system standards including those for environment, quality, and industrial safety and hygiene.
(See our website for a list of sites that obtained certifications regarding environmental systems, quality management systems, or occupational health and safety management systems.)

Responsible Care

Responsible Care Action Plan Results for 2018 and Target for 2019

The Showa Denko Group set the following targets as its Responsible Care vision for 2025.
In order to attain the long-term targets, we have been setting a medium-term Responsible Care action plan every two or three years as well as an annual action plan.
Moreover, we make a specific action plan at each of our plants to promote Responsible Care activities.
The following shows the targets, results and evaluation of our major Responsible Care activities conducted in 2018 as well as targets for 2019.
We will continue to promote active engagement in these efforts to meet our targets.

	Items	Policy and plans for 2018
Environmental conservation	Environmental Management	Policy Let no environmental abnormality occur. Plans ● Thoroughly instill Active Safety at each plant. ● Eliminate environmental risks.
		Plans ● Factor biodiversity into daily business activities.
	Global warming Initiatives	Policy Continuing to improve unit energy consumption. Plans ● Thorough energy conservation
		Policy Reduction in GHG and promotion of energy conservation towards the realization of a low-carbon society. Plans ● Implement and enhance reduction plans.
	Reducing industrial waste	Policy ● Maintain zero emissions. ● Contributing to a recycling-based society. Plans ● Reducing the amount of final disposal by landfill through efforts such as more effective use of sludge.
		Policy Contributing to a recycling-based society. Plans ● Promoting recycling.
	Reducing chemical substance	Policy Reducing chemical emissions. Plans ● Reduce emission at plants with a total emission of 10 tons/year or more, and reduce emission of chemical substances with a current emission level of 5 tons/year or more.
	Responses to water resourcerelated risks	Plans Examining measures based on the reality of the water risks.
Safety and disaster prevention	Equipment safety	Policy Achieve zero incidents. Plans ● Enhance the change management system (to make assessments on the establishment/abolishment of equipment) ● Continue examining the methods used to assess the risk of equipment in an unsteady state ● Continue implementing anti-seismic and tsunami measures ● Foster the planned provision of disaster control training and education ● Promote the introduction of AI, IoT and other systems
Occupational health and safety	Occupational safety	Policy ● Create safety-oriented workplaces and workforces ● Achieve zero lost-time and other incidents at each site and maintain such status Plans ● Rate of lost-time injuries as the group: 0.1 or less ● Elimination of dangerous equipment and work ● Ensure compliance with the rules ● Ensure strict management of irregular operations ● Perform necessary examinations without fail before changing any processes or work procedures
	Occupatinal health	Policy Zero work-related illnesses*1 Plans ● Enhancing sanitation management structure. ● Improving work environment and work methods.
	Health care	Policy Implemented the Showa Denko Group Vivid Health Promotion Plan. Plans Showa Denko Group Vivid HealthPromotion Plan Phase2(2017 to 2018) (1) Preventing lifestyle-related diseases. (2) Improving mental healthcare. (3) Improving lifestyles. (4) Steadily implementing medical. Set the following three priority items while continuing to pursue the targets set for 2016: 1 Enhance the follow-up activities (interviews by doctors/guidance on health) to be conducted after regular health checkups. 2 Reduce overtime work and increase interviewing of employees by doctors. 3 Enhance health support activities according to the situation of each plant. *Focus more on helping employees to be vigorous in their private and work lives through appropriate interviews by doctors and health guidance rather than on improving the prevalence rate.
Consumer Safety and Health Protection	**Chemical substance Management**	Policy No mismanagement Plans ● Ensure the appropriate use of chemical substances in products. (1) Update information about the laws and guidelines enforced in Japan and abroad. (2) Ensure legal compliance for the delivery (and export) of (new and existing) products. Enhance the integrated management system for chemical substances and the database for the management of chemical substances used in products. Revise labels and SDSs to comply with the GHS regulations both in Japan and abroad.
Quality assurance	**Quality assurance**	Policy Ensure product safety and consistent, reproducible quality. ● Achieve zero product accidents and zero compliance violations. ● Reduce major complaints to zero and minimize quality loss. Plans (1) Reduce risk by risk assessment. (2) Enhance legal management including ensuring compliance with voluntary standards. (3) Manage the quality of process capability in a steady manner. (4) Establish a risk-based approach.

*1 Work-related illnesses : Legally recognized work-related sickness by the Workers' Compensation Insurance Law. Appearing symptoms of illness caused by exposure to harmful factors under circumstances of employers' control.
*2 SDS (Safety Data Sheet): This is a document provided by the supplier to the user (customer) of a chemical substance, covering such matters as its name, toxicity, and physical/chemical properties; cautions concerning its handling and storage; and emergency measures. emerge

Showa Denko Group's Responsible Care vision for 2025 By 2025 we will:

- Become able to contribute to the solution of global environmental problems through Responsible Care activities that focus on "Responsible production and consumption."
- Have nurtured a culture of safety across the Showa Denko Group and built the world's top-class safety infrastructure.

◎ Fully achieved (100%)
○ Achieved 80% or more
△ Achieved less than 80%

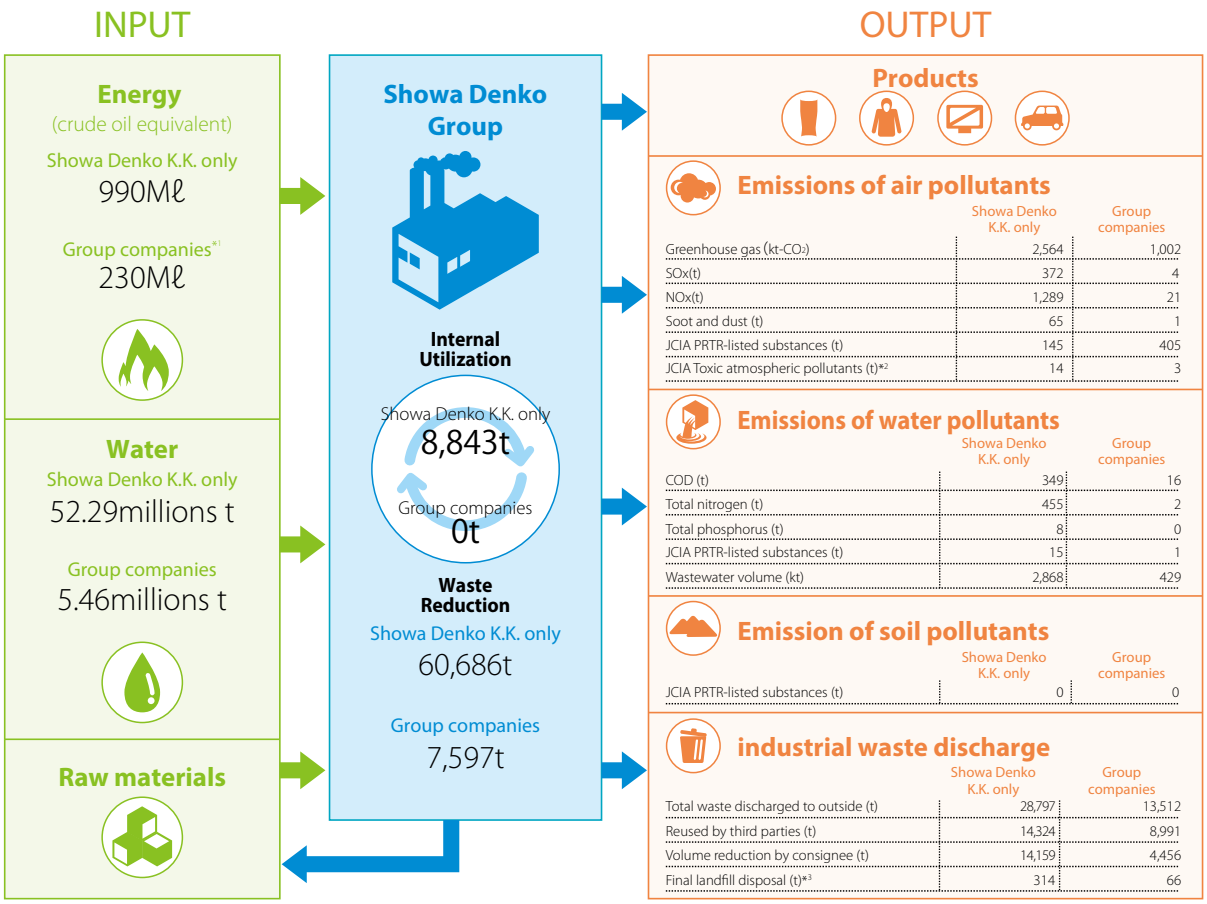
Results and progress in 2018	Evaluation	Policy and plans for 2019
● Two environmental problems occurred within the Showa Denko Group. ● Implemented measures to reduce risks in each plant. (Including the inspection of buried pipes)	△	Policy Let no environmental abnormality occur Plans ● Enhance measures against environmental problems ● Eliminate environmental risks
● Examined and implemented various activities, such as conservation of green areas and reduction of environmental impact of wastewater in accordance ith the circumstances of each plant.	◎	Plans ● Factor biodiversity into daily business activities.
● Achieved the benchmark for one of the three businesses (power supply business). ● Implemented periodic reporting.	○	Policy Continuing to improve unit energy consumption. Plans ● Thorough energy conservation
● GHG emissions: 6% reduction (group) in comparison to 2013 levels. ● Studied year-to-year changes in unit energy consumption. ● Unit energy consumption as designated shippers in 2017 and reduction plans for 2018 to 2019 reported to authorities.	◎	Policy Reduction in GHG and promotion of energy conservation towards the realization of a low-carbon society. Plans ● Implement and enhance reduction plans.
● Amount of final disposal by landfill: 314 tons (Showa Denko, down 42 tons from 2017), 380 tons (Showa Denko Group, down 68 tons from 2017). ● Maintain zero emissions : Group's landfill rate of 0.32%. (down 0.06% from 2017)	◎	Policy ● Maintain zero emissions. ● Contributing to a recycling-based society. Plans ● Reducing the amount of final disposal by landfill through efforts such as more effective use of sludge.
● Production through chemical recycling of plastic waste: up3.3% from 2017 ● Paper recycling (Head Office): 85.2% (up 0.6% from 2017) ● Aluminum can recycling: 97.2% of Group employees participated, with each bringing in an average of 596 cans/ year.	○	Policy Contributing to a recycling-based society. Plans ● Promoting recycling.
● Emissions of JCIA PRTR-listed substances: 159 tons (down 2t from 2017). ● Emissions of hazardous air pollutants: 14 tons (remained the same 2017) ● Failed to achieve reduction of emissions of 5 substances with a current emission level of 5 tons/ year or more, as well as reduction of emissions from 1 lant with a total emission level of 10 tons/year or more.	△	Policy Reducing chemical emissions. Plans ● Reduce emission at plants with a total emission of 10 tons/year or more, and reduce emission of chemical substances with a current emission level of 5 tons/year or more.
● Completed the survey on the plants located outside Japan ● Continued the management of water risks by incorporating water risk countermeasures in the target of risk inventory	◎	Plans ● Set quantitative targets for water resources ● Enhance measures for water resources to achieve the targets
● Equipment incidents within the Showa Denko Group: 11 (All without personal injuries) ● Made improvement plans to be implemented after the completion of the evaluation of safety capabilities as part of the ongoing effort. ● Promoted implementation of irregular case risk assessments (e.g., start up, shut down, upon emergency stops). ● Formulated and promoted anti-liquefaction measures and earthquake resistance reinforcement plans for important facilities handling highpressure gas and hazardous materials as well as for particular buildings. ● Improved the details of education and inspections at the plants certified for highpressure gas treatment.	△	Policy Achieve zero incidents. Plans ● Enhance the change management system (to make assessments on the establishment/abolishment of equipment).
● Showa Denko Group: Experienced 1 incidents resulting in employees taking time off work , 1 incidents without lost work time. ● Showa Denko Group lost-work time incident rate: 0.22 ● Continued to reduce risks posed by dangerous equipment/operations by using the Active Safety checklist. ● Continued to increase employees' safety sensitivity by using risk simulation facilities and through education on lessons learned from past incidents. ● Conducted mutual inspections and safety exchange meetings between the plants for the review of safety activities from a broader perspective. ● Continued to make risk assessments as necessary/urgently before equipment replacement/operational change.	◎	Policy ● Create safety-oriented workplaces and workforces ● Plans ● Rate of lost-time injuries as the group: 0.1 or less. ● Elimination of dangerous equipment and work. ● Ensure compliance with the rules. ● Ensure strict management of irregular operations. ●
● Zero work-related illnesses*1 ● Enhanced heat stroke measures. ● Continued strict management for the treatment of dangerous/hazardous substances, the work environment, and health of employees in charge.	◎	Policy Zero work-related illnesses*1 Plans ● Enhancing sanitation management structure. ● Improving work environment and work methods.
"Showa Denko Group Vivid Health Promotion Plan" Activity Results (compared with last year) Achievement level for the important targets Achieved 100% for the rate of employees undergoing regular health checkups as a precondition. Enhanced follow-up activities (interviews by doctors/guidance on health) to be conducted after regular health checkups. (1) Of employees for whom follow-ups were necessary, 70.7% were interviewed by doctors or received health guidance (up 0.6% from the previous year's level). (2) Reduced overtime work and increased interviewing of employees by doctors. Percentage of employees who worked longer hours: 1.2% (up 0.1% from the 2017 level); percentage of those interviewed by doctors: 99.2% (up 2.3% from the 2017 level) (3) Enhanced health support activities according to the situation of each plant. Implemented various measures at each plant and affiliated company, including the following measures: ● Awareness raising by the provision of information and advice on physical and mental health through online newsletters and paper leaflets ● Campaign to encourage employees to get into the habit of doing physical exercise ● Organization of seminars on mental health (line care and self-care)	◎	Policy Increase the number of employees with high health literacy Plans (1) Conduct activities for the Showa Denko Group Vivid Health Promotion Plan 2021 1 Nurturing the habit of doing physical exercise 2 Improving mental healthcare 3 Improving employees' eating habits (2) Health management 1 Enhance health management ● Keep the rate of employees who undergo regular health checkups at 100% and increase the number of employees who have interviews with doctors/receive health guidance among those for whom follow-ups are deemed necessary ● Have all employees working long hours interviewed by doctors 2 Survey actual on-site situations with the support of an EAP provider and by making visits to the plants 3 Conduct stress checks as appropriate and make use of the results to improve the working environment
● Two cases of abnormal management ● Integrated management system for chemical substances: For the enhancement of the SDS*2 function for overseas use and the provision of the REACH Volume tracking function, made necessary preparations. ● Made appropriate responses to both domestic and overseas regulations: (1) Enhanced the internal management system in response to the revision of the laws, and shared information about the cases of inappropriate management cross the board. (2) Made responses to the revision of overseas laws : Promoted information sharing about the trends of the revision of applicable laws in each country with those related to the country. Made preparations in response to China's 13th five-year plan regarding the legislation for safe production, and made an annual report about new chemical substances in compliance with "China REACH." Made responses to the revision of "K-REACH" and "K-BPR" laws in South Korea. ● Confirmed the completion of the risk assessment made in response to the revision of the Industrial Safety and Health Act.	△	Policy No mismanagement Plans ● Ensure compliance for the management of chemical substances (1) Collect information about the regulatory trends and latest guidelines in Japan and abroad (2) Ensure legal compliance for all chemical substances treated by the Group Enhance the integrated management system for chemical substances and the database for the management of chemical substances used in products Revise labels and SDSs to comply with the GHS regulations both in Japan and abroad
(1) Carried out risk assessments before the market release of products and the shipment of samples as necessary. Enforced the rules on nano-materials. As a result, quality-related risks decreased. (2) Complied with the quality-related laws and regulations as well as with the industry's voluntary quality standards. As a result, had no product-related incidents. Regularly checked the compliance status at the plants. (3) Worked for the establishment of quality assurance activities at each of the plants. Achieved visible results by improving the manufacturing processes based on quantitative indicators. Shared the best practices across the company. (4) Learned lessons from past customer complaints to identify and reduce quality risks and also prevent such risks. As a result, reduced the number of omplaints by about 67% relative to 2015.	◎	Policy Ensure product safety and consistent, reproducible quality ● Achieve zero product accidents and zero compliance violations ● Reduce major complaints to zero and minimize quality loss Plans (1) Reduce risk by risk assessment (2) Build a system to enhance quality compliance (3) Manage the quality of process capability in a steady manner (4) Establish a risk-based approach

Responsible Care

Environmental Conservation

Resource use and environmental impact

Actual values of environmental loads for 2018 are as follows:



*1 Scope of the Showa Denko Group : Total for the 10 consolidated manufacturing subsidiaries in Japan; SunAllomer Co., Ltd., Showa Denko Gas Products Co., Ltd., Showa Denko Ceramics Co., Ltd. (Toyama), Showa Aluminum Can Corp., Showa Denko Packaging Co., Ltd., Niigata Showa K.K. Nippon Polytech Corp., Showa Denko Kenso Co., Ltd., Showa Denko HD Yamagata K.K. and Showa Fine Ceramics Co., Ltd.
GHG emissions include those for Showa Denko Electronics K.K. and Tsurusaki Kyodo Doryoku Co., Ltd., and exclude those Niigata Showa K.K. Nippon Polytech Corp., Showa Denko Kenso Co., Ltd., Showa Fine Ceramics Co., Ltd., which are not required to report emissions as emitters designated under the Act on Promotion of Global Warming Countermeasures.
*2 Emissions of toxic atmospheric pollutants are included in emissions of PRTR-listed substances.
*3 Final landfill disposal: Including only waste generated from production activities during the year.

Showa Denko Group Companies outside Japan

	2014	2015	2016	2017	2018
Discharged amounts of greenhouse gases (kt-CO_2)	380	445	402	416	735
The amount of water used (million m^3)	3.28	3.36	3.30	3.58	5.25
Wastewater volume (kt)	2,280	2,188	2,162	2,093	3,583
Final landfill volumes of industrial waste (t)	2,956	3,864	4,748	5,813	11,374

* The scope of data for 2014 includes Baotou Showa Rare Earth High-Tech New Material.
* The scope of data includes Showa Denko Sichuan Carbon for 2015 and subsequent years.
* In the scope of data for 2018, we have newly included SHOWA DENKO CARBON Germany, SHOWA DENKO CARBON Austria, SHOWA DENKO CARBON Spain, and SHOWA DENKO CARBON Malaysia.

Environmental Accounting

Actual values of environmental accounting for 2018 are as follows:

Environmental accounting (million yen)

			Capital investment	Expenses
Cost within business site	Pollution prevention	Capital investments and expenses associated with prevention of atmospheric/water/soil pollution, noise, vibration, odor, etc.	642	177
	Global environmental protection	Capital investments and expenses associated with energy conservation and combating global warming and ozone-layer depletion	1,148	751
	Resource recycling	Capital investments and expenses associated with resource conservation and waste treatment	465	1,048
Upstream and down stream costs		Costs associated with reducing environmental impact in business operations upstream and downstream, including green purchasing and recycling of products and packaging	0	17
Administrative costs		Administrative costs relating to environmental conservation, including environmental issues training, introduction of environmental management systems, and environmental impact evaluations	12	630
R & D costs		Costs associated with research and development of environment friendly products and technologies	434	845
Community outreach costs		Environmental conservation costs for local community outreach activities not directly linked to business operations, such as environmental conservation projects in communities, dialogue with residents, and plant tours	0	9
Other		Compensation for health damages resulting from environmental pollution, etc.	7	338
Total			2,708	3,815

* R&D costs posted at the Institute for Integrated Product Development (in Toke) and the Advanced Technology Laboratory (in Toke)

Reducing environmental impact (t)

	1990	2018
SOx	3,698	372
NOx	3,522	1,289
Soot and dust	283	65
COD	786	349
Total nitrogen	607	455
Total phosphorus	51	8
Landfill disposal	19,723	314

Economic benefits (million yen)

Energy conservation	237
Resource recycling	450
Waste reduction	9
Other	1
Total	697

Biodiversity Efforts

Basic policies

Showa Denko gives due consideration to biodiversity. It is participating in the Japan Business and Biodiversity Partnership* and assessing the influence exerted over biodiversity by its business activities.

* Japan Business and Biodiversity Partnership: A multi-stakeholder biodiversity initiative that consists of business entities which endorse "Action Policies of Japan Business and Biodiversity Partnership" and are implementing or planning to implement one or more actions among them, and economic organizations, NGOs, researchers, local/national governments and other public organizations which support those business entities' biodiversity initiatives.

Activities in 2018

We have included firm-wide biodiversity conservation activities in the target of the RC action plan. Specifically, we have set a three-year plan for 2019 to 2021, under which we aim to make measurable achievements by conducting business activities in consideration of biodiversity and implementing initiatives that show our commitment to environmental conservation.

In fiscal 2018 we undertook investigations and examinations mainly for the following purposes: to make a plan to secure and manage green spaces; to proactively reduce the environmental impact of wastewater; and to foster environmental conservation activities according to the individual features of our sites. Based on the results, we implemented localized measures at each of the sites. Moreover, we provided all Group employees with information about the relationships between our biodiversity measures and the SDGs through our in-house magazine. In addition to this, we joined the Japan Initiative for Marine Environment (JaIME) to deal with the issue of waste plastics.



The Omachi Plant, Carbon Division of Showa Denko K.K., uses local water resources in its business activities. Plant personnel conducted a cleanup activity in cooperation with members of the local fishing cooperative association, which kindly supports the operations of the plant's hydroelectric power station. They cleaned Lake Kizaki on July 31 and Lake Aoki and Lake Nakatsuna on August 21.



Wastewater from the Isesaki Plant of Showa Denko K.K. is discharged via the Nira River to the Tone River, meaning the plant is somewhat reliant on the Nira River. Accordingly, plant personnel have been participating in the local Nira River cleanup group since 2013.

Responsible Care : Environmental Conservation

Global Warming Prevention Measures

Basic policies

The Showa Denko Group promotes various measures to reduce greenhouse gas emissions and energy consumption as part of its efforts to combat global warming and support resource conservation.

Activities in 2018

1. Reduction of CO_2 emissions

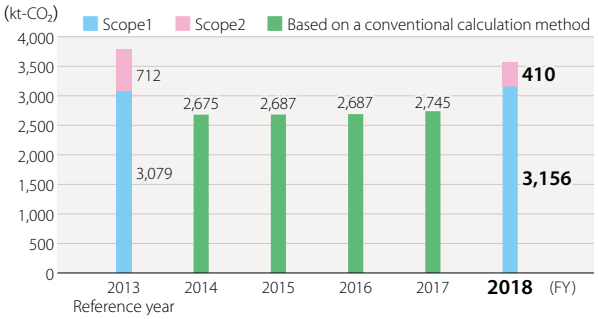
The Group continued its efforts to reduce greenhouse gas emissions, including improvement of production processes, conversion of energy conservation activities, and modifying equipment.

For the results for fiscal 2018, we changed the tabulation method for GHG emissions in Japan to one that conforms to the GHG Protocol. We will foster measures to reduce our GHG emissions by 11% relative to the 2013 level in 2030. This policy has already been deliberated by the Management Committee and reported to the Board of Directors.

Showa Denko also became a signatory to and supporter of the Task Force on Climate-related Financial Disclosures (TCFD) in May 2019.

We will make preparations to disclose related information under the framework set by the TCFD, which will help us foster communication with our stakeholders, while working to deal with climate change.

■ Trends in discharged amounts of greenhouse gases



Note 1: In the data for fiscal 2014 to fiscal 2017, we did not include the figures on the energy used for the generation of electricity and steam sold to outside users and CO_2 emitted from the use of that energy. However, in the data for fiscal 2018, we have included these figures in conformity to the GHG Protocol. We have also included them in the data for fiscal 2013, in order to use the year as the reference year for our GHG emission reduction targets in Japan.

Note 2: We calculated the amount of emissions by using the emission factors indicated in the Act on Promotion of Global Warming Countermeasures of Japan.

■ Scope 3 GHG emissions (kt/YEAR)

	Category	The amount of emission
1	Purchased goods and services	3,437
2	Capital goods	209
3	Fuel- and energy-related activities not include in Scope1 and 2	645
4	Upstream transportation and distribution	39
5	Waste generated in operations	18
6	Business travel	5
7	Employee commuting	1
	Other (down stream)	57,856

2. Utilization of our own hydroelectric power stations

Showa Denko owns and operates hydroelectric power stations at its four plants.

The repair work that had been conducted since 2015 for the long-term use of the facilities was all completed at the end of August 2017.

The total amount of electricity generated by the hydroelectric power stations in 2018 was equivalent to 26% of our total power consumption, up 10% from the fiscal 2017 level.

3. Implementation of c-LCA*

The Showa Denko Group assesses CO_2 emissions across the entire life cycle of each product, encompassing not just direct emissions (Scope 1) and indirect emissions (Scope 2) during production but also emissions during the procurement of raw materials and the use, disposal and recycling of products (Scope 3), contributing to the reduction of CO_2 emissions across society as a whole.

* c-LCA (carbon-Life Cycle Analysis) is a methodology to assess the CO_2 emissions in the total lifecycle of products from the time their raw materials are taken, they are manufactured, distributed, used up, to the time they are abandoned.

(Note) The Greenhouse Gas (GHG) Protocol classifies emissions into three scopes: Scope 1 (Direct emissions from the reporting company), Scope 2 (Indirect emissions from the generation of purchased or acquired electricity), and Scope 3 (Other indirect emissions from the reporting company's supply chain).

4. Reducing environmental impact through supply chain management (SCM)

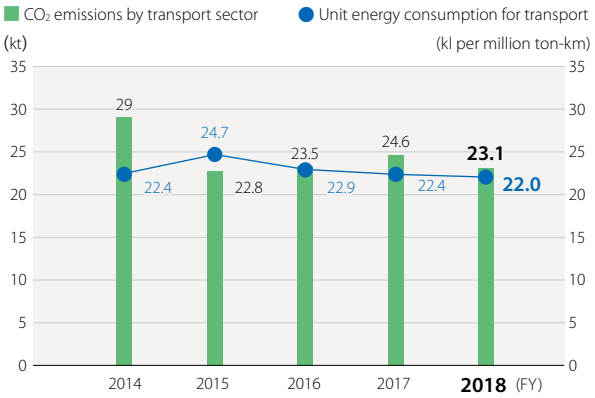
As a way to reduce its environmental impact, Showa Denko is also committed to improving transportation efficiency across its entire supply chain from the procurement of materials through to production, sales and delivery.

In particular, to reduce the environmental impact associated with logistics, we are promoting a modal shift from truck to rail and ship transportation as well as making efficient use of large trucks and increasing their loading efficiency to reduce our CO_2 emissions.

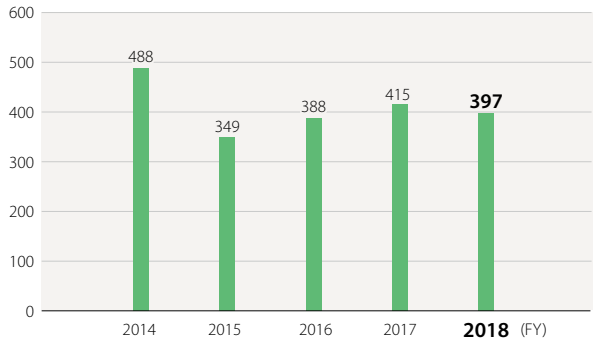
In fiscal 2018, in addition to promoting a modal shift, we also strove to reduce energy consumed for transportation by increasing the shipment amount to minimize the frequency of transportation and by relocating the storage places to reduce long-distance transportation.

As a result, we reduced the transportation volume and thereby CO_2 emissions. We also improved per-unit energy use in our logistics operations, mainly by increasing the ratio of marine transportation, which is more energy efficient, to truck transportation (on a ton-kilo basis).

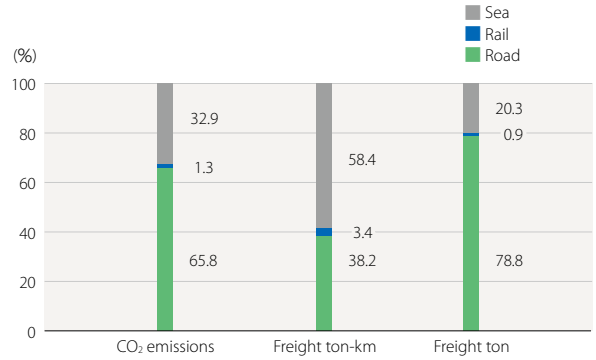
Transportation sector's CO_2 emissions and energy consumption rate



Freight ton-km



Ratios for use of various modes of transport (FY2018)



Responsible Care : Environmental Conservation

Environmental considerations; Atmosphere, water and soil

Basic policies

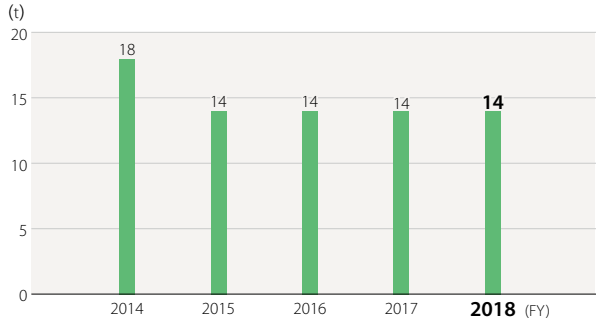
The Showa Denko Group has been conducting "Active Safety" activities to achieve zero environmental incidents. Specifically, we analyze our past accidents and problems to prevent the reoccurrence of similar incidents. In order to prevent air, water, and soil pollution, we also foster fuel conversion and the improvement of our manufacturing processes. Through these measures we are reducing the amount of chemical substances discharged from our sites to reduce their environmental impact.

Atmospher

Reducing emissions of hazardous air pollutants

Of the 12 substances designated by the Japan Chemical Industry Association (JCIA) as hazardous air pollutants, the Showa Denko Group handles eight. We continued our efforts toward reducing the emissions of these substances by promoting a shift to alternative substances and collection and recycling of the substances

Total amounts released of harmful atmospheric pollutants (Showa Denko)



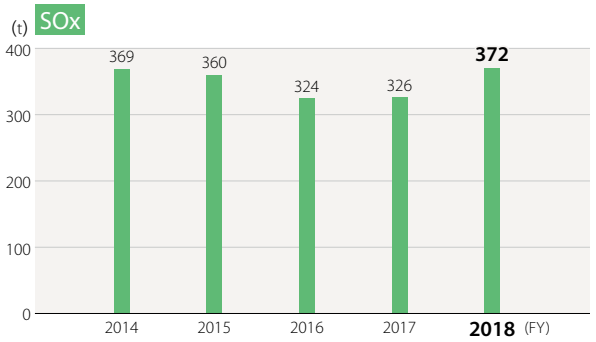
Reducing our environmental impact on the air

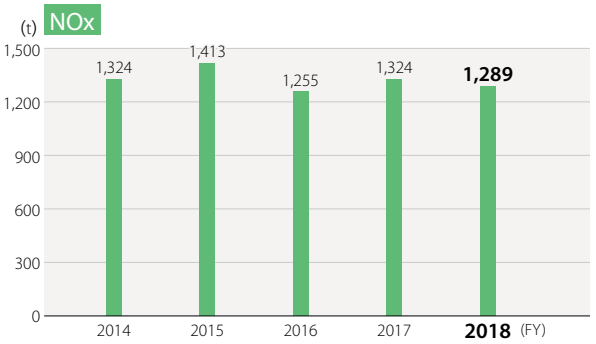
To reduce emissions of SOx, NOx, dust and soot, and other substances having adverse effects on the air, the Group continued advancing a variety of measures including fuel switching, improvement of combustion methods, proper operational management of desulfurization and denitrification devices, and reduced fuel consumption through waste heat recovery.

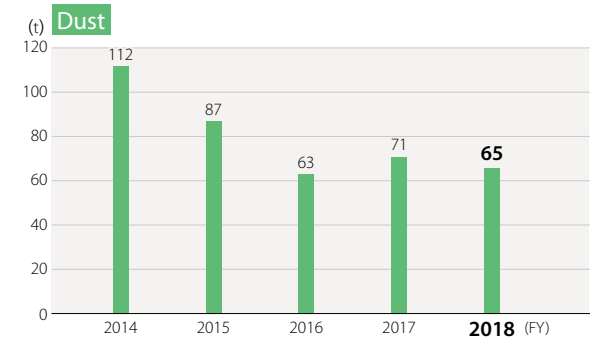


Exhaust gas treatment facility
(Isesaki Plant Showa Denko K.K.)

Change in discharged amounts of substances with atmospheric impact (Showa Denko)





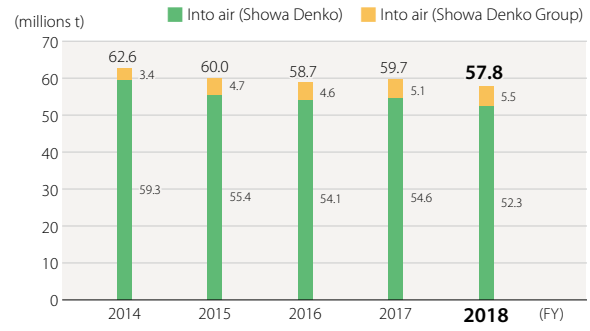


Water

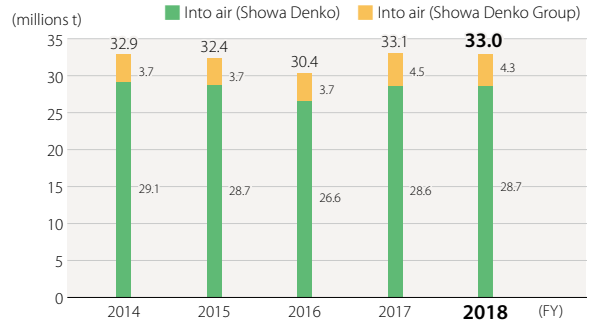
Grappling with water resources

The importance of water resources is recognized across the globe. The Showa Denko Group conducts surveys on risks associated with water resources, implements countermeasures at its sites, and then reviews the risks in reference to the results. The Group proactively works to make efficient use of water and thus reduce water use at its sites, while endeavoring to maintain and improve the quality of wastewater emitted from the sites.

The amount of water used



Wastewater volume



Reducing our environmental impact on water

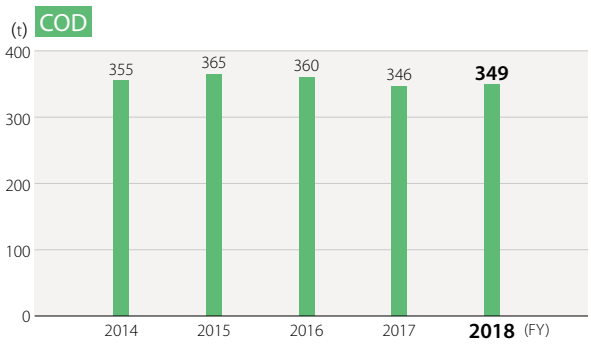
To reduce chemical oxygen demand (COD), total nitrogen, total phosphorus, and other water pollution indexes, the Group continued implementing various measures including improvement of production processes, upgrading and proper operational management of wastewater treatment facilities, and recycling of water.

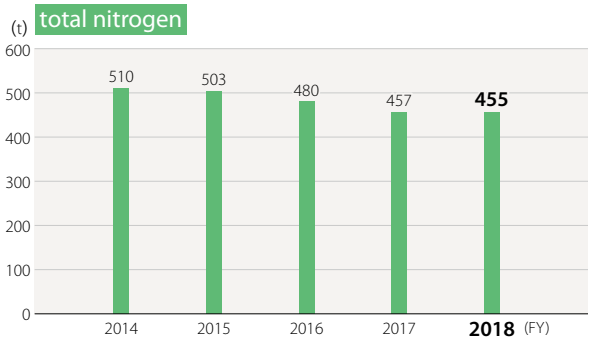
Moreover, we installed equipment to prevent high concentration wastewater from leaking outside via drainage pipes.

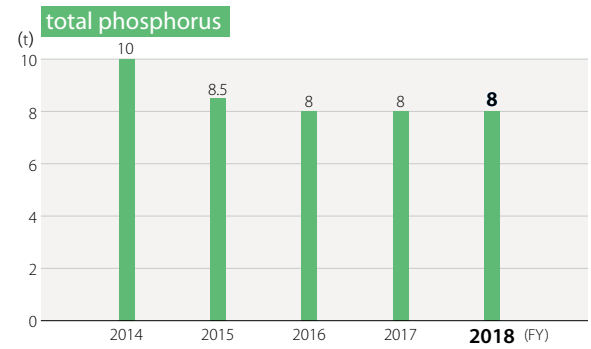


Water quality monitoring system (Oyama Plant Showa Denko k.k.)

Discharged amounts of substances with water quality impact (Showa Denko)







Measures to prevent soil and groundwater pollution

On occasions such as changes in the uses of plant sites or soil removal, the Showa Denko Group undertakes surveys and other measures in line with the Soil Contamination Countermeasures Law and local government regulations. None of the Group's sites exceeded the regulatory environmental standards also in 2018.

Minamata disease in Niigata Prefecture

Fifty years have passed since the outbreak of Niigata Minamata disease was officially recognized.
Maintaining an awareness of the significant scale at which we have caused damage to the victims and residents of neighboring areas through contamination of the Agano River, Showa Denko is 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.

Responsible Care : Environmental Conservation

Reducing Industrial Waste

Basic policies

The Showa Denko Group will continue to achieve zero emissions (meaning that waste sent to final landfill is 1% or less of total waste generated).

Activities in 2018

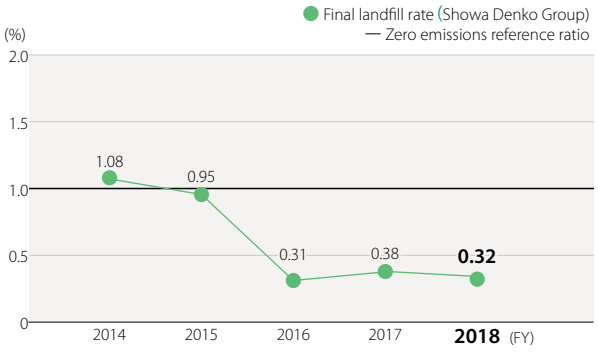
To reduce disposal of industrial waste, the Showa Denko Group has been taking various actions including the reuse of waste acids and waste alkalis, use of waste oil and waste plastics as fuel for heat recovery, and effective use of inorganic sludge as a raw material for cement and others. These measures have been helping us curb generation and promote reuse and effective use of waste materials.

1. Reducing volume of landfill disposal

We continued to reduce the generation of industrial waste and the volume of final landfill waste, thereby continuing to achieve zero emissions (with the Group's landfill rate of 0.32%).

We also inspected our contractors for intermediate treatment and final disposal and confirmed that they treated and disposed of our waste properly.

Final landfill rate of industrial waste



2. PCB control

Based on its PCB control checklist, Showa Denko regularly checks the status of stored polychlorinated biphenyl (PCB) waste for appropriate management. We are replacing PCB containing equipment and commission the disposal to professional companies in a planned manner.

Reducing Chemical Substance Discharge

Basic policies

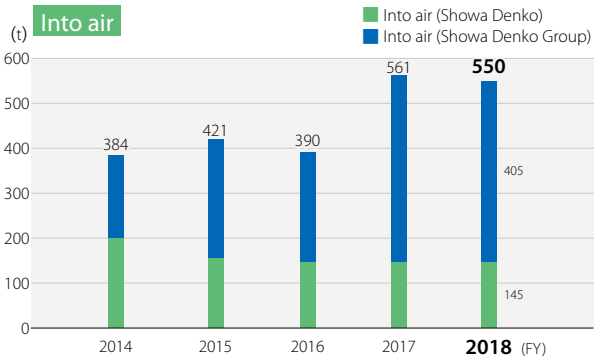
As a member of the Japan Chemical Industry Association (JCIA), Showa Denko has been voluntarily investigating the amount of chemical substances discharged and transferred by the company to reduce the emission of the substances. We also plan and implement reduction measures for each of our plants.

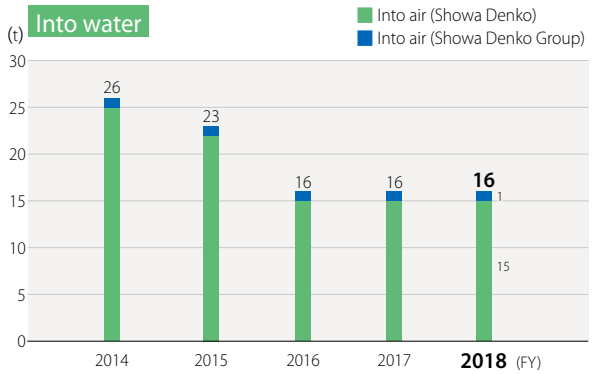
Activities in 2018

Showa Denko investigated the amount of 417 substances, including PRTR-listed substances, discharged and transferred by the company and reported the results to JCIA.

Showa Denko will continue to make focused efforts to reduce discharge volumes by preparing reduction plans for each site for PRTR-listed substances and for substances with high annual discharge volumes. The Company is currently seeking to ascertain and assess potential impact in areas surrounding its sites and improve communication with local communities and governments concerning risks as it works to reduce discharge volumes.

Released of PRTR-listed substances





Safety

Equipment safety

Basic policies

The Showa Denko Group aims to reduce equipment-related accidents to zero by promoting the Active Safety initiative in which we analyze past incidents to prevent recurrences.

The Showa Denko Group has been conducting the Active Safety activities for zero serious incidents. In 2018, however, we had 12 equipment accidents, though fortunately no personal injuries were sustained. In light of the frequent reoccurrence of similar accidents, we began conducting an activity to promote the inherent safety of equipment, while sharing the lessons learned by analyzing the causes of past accidents.

As for the risk assessments related to our future businesses and projects, each department in charge of the business/project makes an assessment, and then members of the head office, including representatives of the Production Technology Department, Corporate Strategy Department, Environment & Safety Office, and the Quality Assurance Office, hold an "engineering meeting" to examine the business/project from a range of viewpoints, including safety, health, and quality to confirm the reliability of the assessment.

Activities in 2018

Response to the industrial safety action plan drawn up by the Japan Petrochemical Industry Association (JPCA)

We placed particular focus on risk assessment of unusual conditions and operations, while implementing educational training sessions and various improvement activities to enhance our safety culture and strengthen our safety foundation.

Measures against disasters

We will continue to take measures against disasters, giving first priority to lifesaving. Particularly for earthquakes, we are fostering effective anti-seismic measures by identifying the equipment and buildings that need to be reinforced and made more earthquake-resistant to protect the lives of their users. Meanwhile, we have confirmed what impact the supply of our products has on society and the importance of fulfilling our responsibility as a supplier as a result of experiencing actual natural disasters, such as earthquakes and typhoons.

In order to become a "social contribution company" that contributes to the creation of a society where affluence and sustainability are harmonized, we will continue to build disaster-resistant business systems both within and outside Japan in line with the expansion of our business domains. We will formulate specific business continuity plans (BCPs) in consideration of the features of our individual products and businesses. We will also identify and rectify problems through education and training. We will thereby steadily manage our business continuity.

TOPIC

Conducting a disaster control drill for an earthquake!

On July 9, 2018, the Tatsuno Plant of Showa Denko K.K. conducted a disaster control drill for an earthquake by using the earthquake early warning system introduced this fiscal year. Specifically, for the drill, it was assumed that an earthquake with the seismic intensity of upper 6 (upper 5 in Tatsuno City) occurred off the coast of Nankai.

The early warning system was activated at the time when the earthquake was assumed to strike, which marked the beginning of the drill. In the training, an emergency response headquarters was established at the plant and HQ personnel collected information about the safety of each department's members and about equipment abnormalities by using wireless communication equipment.

In the future, the plant will also conduct a drill by assuming an earthquake and a fire caused by it as a secondary disaster in an effort to increase its ability to ensure on-site safety.



Disaster control drill conducted at the Tatsuno Plant

TOPIC

Conducing a summer firefighting drill

On June 22, 2018, Lianyungang Zhaoling Abrasives Co., Ltd. (LZA) conducted a summer firefighting drill with the participation of all employees.
The drill started with evacuation training, and participants then tried their hand at firefighting and checking the water spraying equipment. They also reviewed the responses that had been made when a fire actually occurred in the draft chamber.

The evacuation training was conducted based on the assumption that a fire had started in the chemistry laboratory, which has a high risk of fires. After the evacuation training was ended by confirming the safe evacuation of all members, firefighting training was conducted, in which participants actually used fire extinguishers and pulled hoses out from the fire hydrant to practice spraying water. Finally, they reviewed the activities conducted when a fire had actually happened at the site.

LZA will make efforts for safe and stable operation with a strong commitment to preventing any type of equipment incidents, not to mention fire, from happening.



Disaster control drill conducted at the LSA

Responsible Care : Safety

Occupational Safety

Basic policies

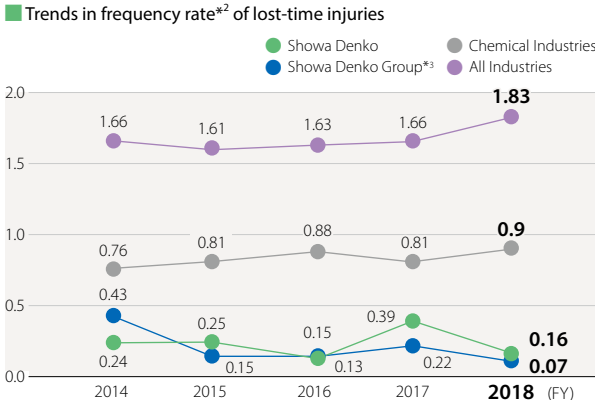
In order to eliminate work-related accidents, the Showa Denko Group is promoting Active Safety activities by using its own Active Safety Checklist developed in-house. Each site of the Group has a safety & health committee and other organizations in place in line with the Industrial Safety and Health Act of Japan and is conducting safety activities through labor-management cooperation.

Activities in 2018

In 2018, the Showa Denko Group had four lost-time injuries, including those sustained by employees of partner companies. In light of the fact that the risk of injuries was relatively high for irregular work, such as installation work, and work at partner companies, we conducted activities to identify and reduce risks from broader viewpoints, including organizing mutual inspections between our bases and holding safety exchange meetings by segment. We also fostered the effective use of information about past incidents across the company by emailing the "Safety Calendar" to employees to help them increase their safety sensitivity and awareness. Moreover, we collected information about work-related incidents other than lost-time injuries to analyze incident occurrence tendencies, while also enhancing safety education and providing non-technical skill*1 training by using risk simulation facilities.

*1 Non-technical skills means general skills that workers (and their instructors) need to have to prevent human error and ensure safety, including the skills to understand the situation, communicate effectively, and provide leadership.

Trends in frequency rate*2 of lost-time injuries



*2 Frequency rate of lost-time injuries = (Number of deaths and injuries)/(total working hours) x 1,000,000

*3 Scope of Group companies (As of December 2018)
Tsurusaki Kyodo Doryoku K.K., Showa Denko Gas Products Co., Ltd., Clean-S Showa K.K., Union Showa K.K., Showa Denko Ceramics Co.,Ltd. , Shinshu Showa K.K. , Showa Denko Packaging Co., Ltd. , Showa Denko Sakai Aluminum K.K., Showa Denko Kitakata Aluminum, Showa Aluminum Can Corp., Showa Aluminum Can Recycling Center, HIPACK Co., Ltd., Showa Denko Electronics K.K., Chichibu Showa Denko, Niigata Showa K.K., HI-PACK Co., Ltd. , SunAllomer Ltd. Nippon Polytech Corp., Showa Denko Kenso K.K., Showa Fine Ceramics Co., Ltd. , Fuyo Perlite Co., Ltd. , Showa Denko HD Yamagata K.K., and Shoko Electronics Co., Ltd. ,

TOPIC

Conducting non-technical skill training

On August 1, 2018, the Shiojiri Plant of Showa Denko Ceramics Co., Ltd. conducted non-technical skill training by inviting a guest lecturer from AGC Inc.

A total of 63 workplace managers participated in the training from the plant and also from Showa Fine Ceramics Co., Ltd. First, the lecturer described the purpose and outline of the non-technical skill training by introducing the related activities conducted at AGC, and then participants were divided into groups by workplace to play a game, in which they shared information within each group to guess what words were hidden. After playing the game, they individually filled in a self-check sheet and loudly announced their self-evaluation results to other members of the group, thereby reviewing their own behavior and gaining a personal understanding of how difficult it can be to communicate information correctly.

The plant will enhance the safety of the entire facility by providing on-site employees with more safety education.


Non-technical skill training held at the plant

TOPIC

Organizing hands-on safety training

On October 4, 2018, the Oita Complex of Showa Denko K.K. organized hands-on safety training by inviting guest lecturers from the Kurosaki Plant of Mitsubishi Chemical Corporation.

This training is held annually to enhance the safety sensitivity of participants and ensure that safety skills will be passed down at the plant. This year, a total of 75 people attended the training, including workers employed by the Complex and those from neighboring companies.

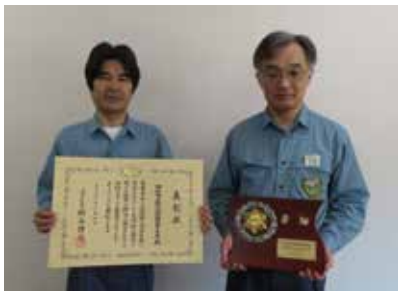
On the day, three seminars were held at three venues: a seminar to gain hands-on experience of dealing with a fire and an explosion; a seminar to gain hands-on experience of getting caught in a roller; and a seminar to experience using a pressure relieving device. Participants strongly recognized the importance of keeping their workplaces safe through these seminars and the training ended a success.

The Oita Complex will continue to provide education and training for the safe and stable operation of the facilities toward achieving zero incidents and disasters.


Hands-on safety training held at the Complex

2018-2019 List of RC-related awards received by the Showa Denko Group companies

	Name of award	Recipient site and individual	Mouth received
2018			
Disaster prevention	Fiscal 2018 Excellent Hazardous Materials Facility Accredited by the Commissioner of the Fire and Disaster Management Agency	Chichibu Plant of Showa Denko K.K. (Photo①)	June
	Maintenance award of the 10th Japan Petrochemical Industry Association	Yoshiaki Oda , Tokuyama Plant of Showa Denko K.K.	November
Health and occupational safety	Fiscal 2017 Minister of Health, Labour, and Welfare's Award for businessfacility managers who place priority on safety	Akira Morii , Oyama Plant of Showa Denko K.K.	January
	Accident-free record certificate from the Ministry of Health, Labour and Welfare (Fourth-class)	Oyama Plant of Showa Aluminum Can Corp.	February
	Safety Merit Award of the 42th JCIA Safety Awards	Showa Denko HD Yamagata K.K. (Photo②)	May
	Special Award for Excellence, 2017 Japan Aluminum Association Occupational Safety Awards	Oyama Plant of Showa Denko K.K	
		Omuta Plant of Showa Aluminum Can Corp.	
		Oyama Plant of Showa Aluminum Can Corp.	
	Award for Excellence, 2017 Japan Aluminum Association Occupational Safety Awards	Showa Denko Sakai Aluminum K.K.	
	Accident-free record certificate from the Ministry of Health, Labour and Welfare (Third-class)	Oyama Plant of Showa Denko K.K	November
2019			
Health and occupational safety	Award for Grand Prix, the 43rd JCIA Safety Awards	Oyama Plant of Showa Denko K.K. (Photo③)	May
	First Prize (Special Award), 43rd JCIA Safety Awards	Showa Fine Ceramics Co., Ltd.	
	Special Award for Excellence, 2018 Japan Aluminum Association Occupational Safety Awards	Oyama Plant of Showa Denko K.K	
		Omuta Plant of Showa Aluminum Can Corp.	
	Award for Excellence, 2018 Japan Aluminum Association Occupational Safety Awards	Showa Denko Sakai Aluminum K.K.	



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Responsible Care : Safety

Chemical Substances Safety

Basic policies

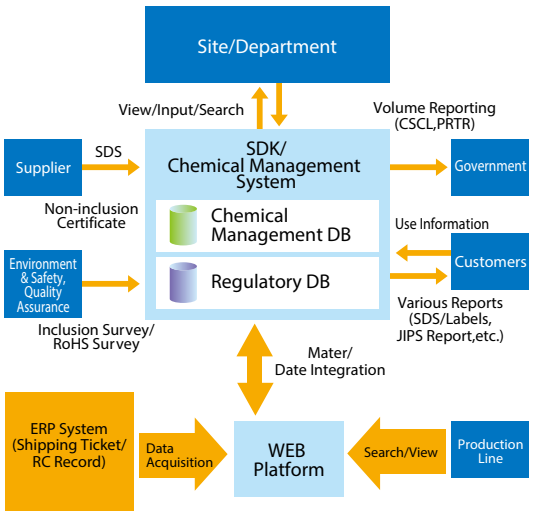
At the World Summit on Sustainable Development (WSSD) held in 2002, participants agreed to pursue the goal of minimizing the adverse effects of chemicals on human health and the environment by 2020, and activities to ensure the safety of chemicals have since been fostered across the world.

In order to "provide products and services that are useful and safe and exceed our customers' expectations," the Showa Denko Group takes a risk-based approach and proactively participates in the activity conducted by the International Council of Chemical Associations (ICCA) for the comprehensive management of chemical substances. Specifically, we work to ensure the safety of chemicals throughout their life cycle, from R&D through to the design, manufacture, sale, transportation, use, and disposal stages. In addition to confirming the safety of chemical substances used in our products, we give consideration to a range of related items, such as how customers use our products and how they will be disposed of, thereby identifying and reducing any risks related to the products.

Chemical substance management system

We have expanded our comprehensive chemical substance management system and are making effective use of the system as the basis of our efforts to ensure compliance for chemical substances used in our products.

■ Comprehensive chemicals management system



Activities in 2018

Sharing information about chemical substances

We established a database for the management and internal/external sharing of information about the hazardousness of chemical substances used in materials and products, related risks, legal regulations, and about their applications across the supply chain.

Compliance with chemical substance-related laws and regulations in Japan and abroad

The Showa Denko Group monitors the trends of Japanese and foreign regulations on chemical substances. For the chemical substances used in our products, we proactively work to ensure compliance with the law by using the aforementioned database.

Moreover, for the management of export volume as required by the laws enforced in each country, we are utilizing the tabulation function of the comprehensive chemicals management system to make necessary reports to the administrative agencies in a highly reliable and transparent manner both within and outside Japan.

In Japan: We are utilizing the comprehensive chemicals management system to systematically ensure compliance with the related laws, including those related to the control of chemical substances, occupational health and safety, poisonous and deleterious substances, and PRTR.

Outside Japan: We are making use of various databases, monitoring the trends concerning the revision of laws, and sharing information with related locals to ensure compliance in each country.

Quality Assurance

Quality Assurance

Basic policies

The Showa Denko Group is committed to providing products and services that are useful and safe and exceed our customers' expectations. To this end, we organizationally and systematically conduct "product safety" activities to assure customers that our products are safe throughout their life cycle, from design and development to market release, production, sales, and after-sales. In these activities we take a risk-based approach.
Specifically, to identify and reduce our product-related risks, we give consideration to a range of items, including how customers use our products and how they will be disposed of, in addition to confirming the safety of chemical substances used in the products.

As the basic rules for product safety activities, we set the Quality Assurance and Quality Control Rules ("Rules") within the company. We review the Rules annually to revise them according to changes in the environment and society and thereby keep them effective to ensure product safety.

■ Quality Assurance and Quality Control Rules



Activities in 2018

To enhance our quality assurance and management capabilities, we implemented the following activities:

1. Product safety management

To help customers use the Showa Denko Group's products in a safe manner, we collect information about the safety of chemicals and related legal regulations. We centrally manage the collected information under our comprehensive chemical substance management system. Specifically, we use our Safety Data Sheets (SDSs)*1, product labels, and yellow cards*2 to provide customers with the latest and appropriate information on chemical safety.

We also have a risk-based screening system to decide whether or not to ship a sample new product to a customer or release a new product into the market.

In 2018, we worked to optimize the workflow from collecting safety information through to the provision of the collected information and started operating a system built to provide our customers with necessary information without fail.

*1 SDS (Safety Data Sheet):
This is a document provided by the supplier to the user (customer) of a chemical substance, covering such matters as its name, toxicity, and physical/chemical properties; cautions concerning its handling and storage; and emergency measures.
*2 Yellow card:
This refers to an emergency contact card, which is recommended by JCIA, to briefly describe appropriate response by transportation company personnel, police, and firefighters in the event of accidents involving hazardous or toxic substances.

2. Quality management system (Quality control scheme)

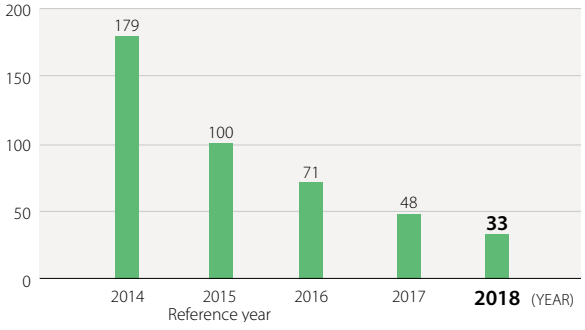
The Showa Denko Group has established quality management systems suitable for each product and organization, and has acquired certification for ISO 9001, IATF 16949, and other international standards.

In response to the revision of these international standards, we worked to comply with the revised standards and completed the process by the end of the transition period in 2018. Moreover, taking this opportunity, we enhanced our quality management system to provide customers with products and services with even higher quality.

3. Reducing complaints

In 2018 we conducted activities to attain the target of reducing the number of complaints about the quality of our products by half relative to 2015. As a result of implementing measures to prevent the reoccurrence of similar complaints based on analysis of the true causes of complaints and by learning and sharing lessons from the complaints made to the Showa Denko Group, the number of complaints dropped by 67% relative to 2015 and by 31% relative to 2017.

■ Trends in annual numbers of complaints
(With a score of 100 representing the number of claims in 2015)



Access to Essential Services

4. Enhancement of on-site capabilities

In order to raise our quality assurance and management level, we set the target of enhancing the capabilities and quality awareness of on-site workers and clarified the level to be attained by the departments in charge of quality assurance. We then checked the current level of the Divisions, Plants, and Group companies and made a specific plan to raise their levels. Furthermore, we launched the measures to automate the quality checking system, not only to increase our operational efficiency but also to prevent quality fraud and human error.

5. Quality diagnoses

Personnel from the Head Office's Quality Assurance Office visit and carry out annual quality diagnoses at the Group's sites, including the Divisions, Plants, and Group companies, to clarify their strengths and weaknesses and share the findings.

In 2018, we worked to increase on-site capabilities at our sites, including the ability to manufacture products with uniform quality (process ability) and the ability to identify and reduce quality risks, by identifying any related problems and making improvements.

Basic policies

In its business activities, the Showa Denko Group is committed to providing "Access to essential services." This means that we will not discontinue any services that are as indispensable for day-today life as water supply without granting a reasonable extension of time.

Activities in 2018

The Showa Denko Group continued offering products and technologies with a high level of customer satisfaction as well as information on them in order to further enhance the trust and loyalty of customers toward the Group. Although not many of our products are offered directly to consumers, we ensured, as usual, the safe and stable supply of sodium hypochlorite used for sterilizing tap water, amino acids used as raw materials for medical and agricultural chemicals, and other products important for essential services.

TOPIC

Ensuring the safety of food to be delivered to consumers: Dry ice

Dry ice or solidified carbon dioxide gas is used mainly for the low-temperature transportation and storage of foodstuffs and medical/chemical products. It is made from carbon dioxide gas generated as a by-product at oil refinery, iron making and ammonia manufacturing facilities. The supply of gas used to make dry ice has been tight in Japan, due to reduced production at the aforementioned facilities, which in turn has reduced the supply of dry ice.

In response to the tight supply, Showa Denko Gas Products Co., Ltd. built liquefied carbon dioxide manufacturing facilities within the Oita Petrochemical Complex and started operating the facilities in April 2019. By ensuring the stable operation of the facilities, the company will provide local customers with safe products of stable quality, while also contributing to the development of the local economy.



The newly opened facilities

Human Rights and Labor Practice

Human Rights

Basic policies

The Showa Denko Group regards respect for human rights as the basis of its business management and is continuously implementing measures to raise all of its employees' awareness of human rights.
In Japan, we intensively conduct awareness-raising activities at each site during Human Rights Week every December. We also include a program on human rights and corporate ethics in the programs comprising our level-specific training.

Activities in 2018

The Showa Denko Group has been conducting awareness-raising activities for human rights and corporate ethics across the board.

Awareness-raising activities regarding human rights

In Japan, the Showa Denko Group aims to give all employees 1.5 hours of education on human rights and corporate ethics each year to continue their edification on these topics. In 2018, we held seminars and other events on the following themes at each of our sites: human rights-related themes familiar to employees (prevention of harassment, promotion of communication, etc.); and human rights issues as pointed out by the Japanese Ministry of Justice (so-called Dowa issue, those related to foreign nationals, human trafficking, etc.).

TOPIC

Launching activities to promote understanding about LGBT people

The Showa Denko Group has been working to raise employees' awareness of the human rights of LGBT people. For example, we organized a seminar featuring guest speakers from the LGBT community at the head office of Showa Denko K.K. in January 2018 and distributed "LGBT ALLY" stickers to seminar participants.
We will include LGBT issues in the human rights-related issues to be addressed at each of our sites and enlighten and educate employees more on the issues.



"LGBT ALLY" sticker

Handling harassment

To eliminate all kinds of harassment at its workplaces, the Showa Denko Group is continuing to organize awareness-raising and other activities for employees.

In 2018, we held seminars and other events on the subject of harassment at our sites. In December of that year we also organized a lecture featuring an invited expert speaker on the measures that companies should implement to prevent workplace bullying targeting general affairs/personnel affairs managers of all the sites of Showa Denko K.K.

We also have employees tasked with responding to the issue of harassment at our sites in Japan and at Group companies, including some located outside Japan. These employees can be consulted by all members of the workplace, not just regular employees. When an incident is reported, the related situation and facts are examined and confirmed, and if, as a result, the company deems the incident as constituting harassment, necessary measures are taken in regard to both the perpetrator of the harassment and the victim, as well as measures to prevent the reoccurrence of similar incidents.


Lecture given by an expert on preventing harassment

Human rights throughout the supply chain

In order to conduct business that takes human rights throughout the supply chain into consideration, we ask our business partners to respect basic human rights, prohibit discrimination, ensure proper work conditions, and protect the rights of the workers through our CSR procurement program. We work together with our partners to comply with these matters.

Please also see page 46, where we outline our CSR procurement.

* For our corporate ethics-related measures, please see page 40.

Human Rights and Labor Practice

Diversity

Basic policies

The Showa Denko Group has been promoting diversity as one of its management strategies. Under the slogans of "Make the most of the potential of yourself" and "Make the most of the potential of others," we are working to develop the Group's employees and organizations into people and entities able to cooperate with each other while making use of their diverse features, values, and ideas to continue making profit and creating new value.

Activities in 2018

We have been promoting diversity at each of our sites and Group companies in Japan.

Activity to change the corporate culture

As its goal for diversity, the Showa Denko Group aims to transform itself into an organization where a diverse range of employees can demonstrate their respective abilities, for which we will improve management practices, communication, and work styles at our workplaces.

Since 2015, we have been promoting "action learning" for mid-level managers of our sites and Group companies in Japan to help them develop a vision for the future of their organizations and continuously take actions for the achievement of the vision. In 2018 we provided these managers with opportunities to share examples of relevant activities conducted at their organizations and held a session in which the managers discussed the three-year (2019–2021) business plan with members of the Corporate Strategy Department.

In addition, since 2014, we have been annually holding a program in which the CEO gives commendations to outstanding diversity promotion activities conducted at our sites and Group companies. In 2018 the CEO commended a record-high number of initiatives (19 initiatives) in the program.

We will steadily continue to foster diversity and change our corporate culture across the Group.



Commendation by the CEO for promoting diversit

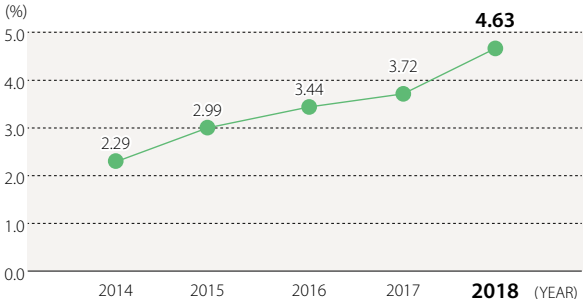
Support programs to help female employees play active roles

The Showa Denko Group works to empower female employees in Japan.

Showa Denko K.K. aims to increase the percentage of women among section managers and those in higher positions to 5% by 2020 in its action plan made in line with the Act on Advancement of Measures to Support Raising Next-Generation Children.

Based on this plan, we have been continuously holding career support seminars and other events for mid-level career-track female employees since 2016.

Percentage of women in managerial roles at Showa Denko (on an unconsolidated basis)



Number of female managers (Showa Denko)

	2014	2015	2016	2017	2018
Number of female managers	18	23	26	28	33

Support programs to help foreign employees play active roles

The Showa Denko Group works to empower non-Japanese employees. We are also sequentially creating and supplying multilingual versions of internal documents as a means of retaining non-Japanese employees and empowering them to demonstrate more of their abilities.

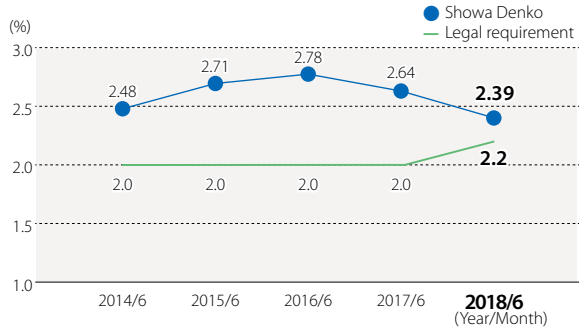
Employment of handicapped persons

In Japan the Showa Denko Group has been proactively employing people with physical, intellectual, mental, and developmental disabilities and providing them with training and education as part of its efforts to promote diversity.

For employees with disabilities we established a model workplace led by the "Job Support Team" (JST) within the head office of Showa Denko K.K in 2013. At this workplace, we started by giving the employees easy jobs such as cleaning the meeting rooms, and then sequentially expanded the scope of their jobs to include printing business cards and then IT-related operations such as deleting data from end-of-life PCs.

In 2018, we worked to give individual support to our sites and share with them the JST's know-how in order to expand the scope of jobs available to people with disabilities and help them develop their skills in line with their personal characteristics. As a result, both our sites and Group companies began to accept as interns or employ people with intellectual, mental, and developmental disabilities. Moreover, we established a special contact to offer consulting services provided by "job coaches."

■ Ratio of handicapped employees (Showa Denko)



Employment of the aged

In Japan, the Showa Denko Group reemploys retired employees so that they can continue to use their long-accumulated skills and expertise at their workplaces.

■ Ratio of reemployed employees

	2014	2015	2016	2017	2018
Ratio of reemployed employees (%)	90	85	89	83	79

TOPIC

Granted a prize of excellence in the general paper division at the 56th convention of the HITACHI IT Users Association

At the 56th convention of the HITACHI IT Users Association, Mr. Nakamura from the Diversity Group at the Human Resources Department and Ms. Yoshinouchi from the Information Systems Department of Showa Denko K.K. together with Ms. Oe from the IT Solution Division, Hitachi SC, Ltd. won a prize of excellence in the general paper division for the paper they had co-authored on the expansion of the job scope for people with intellectual and developmental disabilities.

Showa Denko K.K. began employing people with intellectual and developmental disabilities in 2013. Initially these employees were engaged in routine work, such as replacing toners in multifunction machines and keeping cables and so on in order in meeting rooms. Subsequently, in order to expand employment opportunities for people with such disabilities, the company began to search for ways to help them demonstrate their unique strengths while supporting them in regard to their weaknesses. As a result, the scope of jobs available to people with disabilities was expanded to include the printing of business cards, tasks related to the reuse of consumables, delivery of toners for multifunction machines, and deleting data stored on PCs. These employees can engage in these jobs thanks to the IT-based communication system and the IT tools that they use, with reference to manuals that include lots of visual images.

The prize-winning paper was written about the aforementioned initiative implemented by Showa Denko with the help of Hitachi SC. The prize was given in recognition of the fact that Showa Denko had launched an internal system directed toward the empowerment of people with disabilities, that the initiative provided a useful model for the examination and promotion of job scope expansion for such people, and that IT was proven to be an effective tool for the empowerment of a range of workers, including those with disabilities.



Recipients of the prize

*The HITACHI IT Users Association was established in 1964 as a research and friendship association of users of IT-related products, systems, solutions, and services provided by Hitachi, Ltd. and its group companies.

Human Rights and Labor Practice

Development of Human Resources

Basic policies

The Showa Denko Group develops its workforce through a variety of programs.

Activities in 2018

Training System

Showa Denko provides individual employees with training that is suitable for their current roles and expected careers based on the level-specific training system established on the theme of business literacy and career development.

To support self-development, we also offer correspondence courses and e-learning programs.

In addition, we have a program to develop business and corporate reform leaders, in which candidates for the Showa Denko Group's future top management receive training in a step-by-step manner.

Moreover, we are promoting the development of global human resources. Specifically, we provide employees in Japan with opportunities to conduct research or acquire an MBA at overseas universities, receive practical training at overseas subsidiaries, and participate in manager training provided individually by overseas subsidiaries. Furthermore, we are planning to launch a selective education program under which candidates for the next-generation of executives of the Showa Denko Group are selected from among managerial human resources of the Group in Japan and overseas and receive special education.

We offer a detailed explanation on Showa Denko's training system in the section on lifelong learning on our website.
(https://www.sdk.co.jp/contents/recruit/new/environment/training.html)

Personnel system

Showa Denko is operating a personnel system that values growth and development. Known as the "MB-OJT system," it incorporates OJT elements into the conventional management-by-objectives (MBO) framework.

In the face-to-face discussion between employees and their supervisors called "commu-cussion," employees and supervisors develop a shared understanding of the employee's targets and performance appraisals and discuss what has and what has not been achieved as well as what lessons were learned for the future. This helps individual employees to achieve self-growth and development.

Employee surveys

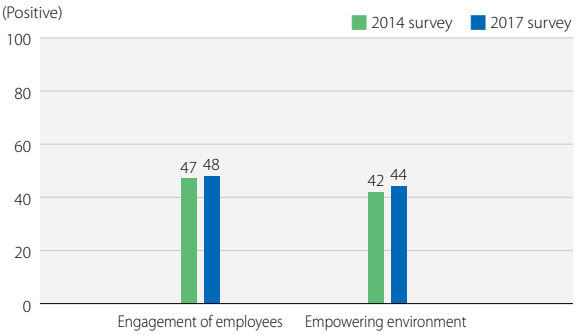
The Showa Denko Group conducts employee surveys to quantitatively understand the situations of individual employees and their organizations.

We have conducted the survey twice, in 2014 and 2017. In the last survey, conducted in 2017, responses were received from a total of 8,894 Group employees, including those of some Group companies outside Japan (response rate: 90.7%).

Compared with the results of the 2014 survey, there was a slight increase in the percentage of employees who gave positive answers to the two major questionnaire items (about employee engagement and employee empowerment in terms of the workplace environment). The percentage of those who gave positive answers substantially increased for the questions on the strategies and direction of the Group and its organizations, but the results of the survey also indicated that there were some problems regarding workplace communications.

In 2018, we gave feedback to both top management and employees about the results of the second survey and analyzed the results by organization in order to identify problems and make plans to deal with them for each of the in-house organizations, while also examining measures to be implemented by all Group companies in Japan.

Results of the employee survey



Creating a comfortable workplace

Basic policies

It is important for the growth of our Group that it meets social needs through the lively work of employees who are able to live in harmony with society.

The Showa Denko Group is implementing measures to help individual employees lead fulfilling lives as members of the community.

Activities in 2018

Work style reform

We continued our measures for work style reforms, including designating a "no overtime work" day, according to local situations at our sites in Japan and at Group companies.

Trend in working hours (per employee per year)

	FY2014	FY2015	FY2016	FY2017	FY2018
Showa Denko	2,023.1	2,002.9	2,008.8	2,011.9	2013.5
Manufacturing industry average*	2,047.2	2,053.2	2,049.6	2,053.2	2049.6

*The manufacturing industry average was prepared using the data in the "Annual report on the monthly labour survey" published by the Ministry of Health, Labour and Welfare Annual paid holidays taken (per employee per year)

Annual paid holidays taken (per employee per year)

	FY2014	FY2015	FY2016	FY2017	FY2018
Showa Denko	13.2	13.6	13.6	13.8	13.6
Manufacturing industry average*	10.3	10.1	10.4	10.7	11.0

*The manufacturing industry average was prepared using the data in the "General survey on working conditions" published by the Ministry of Health, Labour and Welfare.

Promoting sound work-life balance

Showa Denko has systems to support employees in maintaining a good work-life balance at each stage of life and has been continuing to implement measures to encourage employees to utilize the systems, including conducting a campaign to encourage male employees to take childcare leave.

In 2018, we introduced a work-from-home system for employees engaging in childcare/ long-term nursing care, thereby providing them with more flexible work style options. The work-from-home system is designed to help the targeted employees make effective use of the time saved by working from home, such as time otherwise spent in commuting. Under this newly introduced system, some employees work from home regularly, and the system has thus already been utilized by employees to keep up a good work-life balance.

Support programs

Main Systems	Description
Childcare leave	Eligible: Employees with one or more years of continuous service who live with dependent children of less than two years of age. Available through the day preceding the child's second birthday.
Shortened working hours for childcare/ family care	Eligible: Employees with one or more years of continuous service and who have a child of preschool age or who are eligible for family-care leave. Eligible employees may choose to reduce standard working hours by up to two hours/day.
Cumulative leave	Eligible: Employees who have accumulated leave time (annual paid holidays carried over from year to year). Employees may take days off to participate in a school event (up to and including elementary school children), respond to temporary closing of classes, or nurse a child or family member.
Family care leave	Eligible: Employees with one or more years of continuous service who have a family member requiring nursing care are eligible. Employees may take this leave for a total of 93 days or a total of 12 months over two years from the start of the leave period, depending upon the relationship between the employee and the family member in need of care.

Number of employees who took the advantage of the work-life balance support systems Showa Denko (2018)

	Male	Female	計
Childcare leave	67	52	119
Family care leave	0	0	0
Shortened working hours for childcare/family care	0	45	45

Relations with the labor union

The company and the labor union have established a relationship of trust over many years by establishing (1) Solutions through discussions, (2) Pursuit of stable employment and job satisfaction, and (3) Working together to improve work conditions through company growth and higher profitability as the basis of the labor agreement.

In 2018, in addition to regular dialogues via the Labor-Management Committee, extra meetings were held to discuss a range of themes, such as the compensation system and the review of the relevant rules.

Promoting mental and physical health

Basic policies

To work vigorously without anxiety, it is important for each of employees to maintain and promote health of his/her own and the whole family throughout lifetime.

Accordingly, for two years from 2017 to 2018, the Showa Denko Group conducted activities for its health promotion plan (phase 2) with a focus on the prevention and control of lifestyle-related diseases and on mental health promotion.

Activities in 2018

In order to prevent and control lifestyle-related diseases including metabolic syndrome, we worked to enhance follow-up measures for employees who were diagnosed in their health checkup as having problems. As a result, 70% of such employees across the company and 100% in the head office district participated in follow-up interviews and received instructions on how to improve their lifestyles.
We also published newsletters to encourage employees to do physical exercise and held sports events, yoga classes, and others at each of our sites.

For mental health, we organized "line care" seminars to educate managers on how to care for employees' mental health and self-care seminars to help employees do the same for themselves. We also checked the mental stress levels of employees, implemented follow-up measures for those found to be experiencing significant stress, and worked to improve the environment of highly stressful workplaces.



Line care seminar



Self-care seminar

As contacts for consulting on mental health, the health insurance association provides advice by telephone and in the head office district we also have psychiatrists available for consultation. For employees taking leave due to mental problems, we are using the employee assistance program (EAP) to help them return to work.

Moreover, in 2019, we established a health and productivity management promotion group within the company and began formulating a medium-term health promotion plan.

In recognition of these activities, Showa Denko K.K. in 2019 was named among the 500 Certified Health & Productivity Outstanding Organizations for the third year in a row.

2019
健康経営優良法人
Health and productivity
ホワイト500

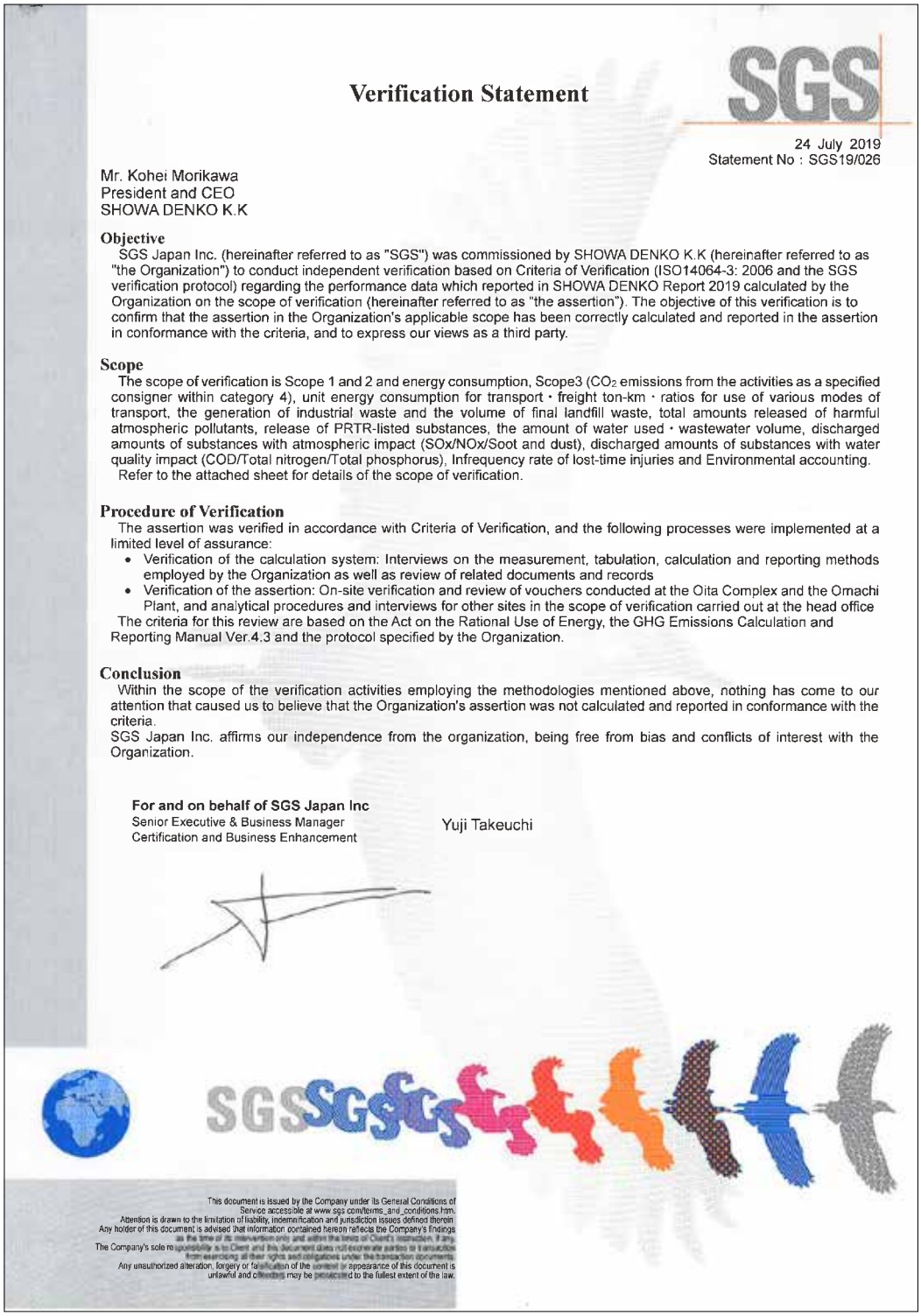
Scope of the Showa Denko Group

■ Scope of the Showa Denko Group

		Energy consumption	CO_2(energy source origin)	CO_2 and six greenhouse gas emissions (not from energy use)	Water consumption / drainage (environmentally hazardous substance emissions)	Amount of industrial waste generated (contents included, landfill disposal amount)	VOC emissions	PRTR substance emissions	Amounts of substances with atmosphere (SOx, NOx, Soot and dust)	Social data (employment loss rate)
In Japan	Showa Denko Gas Products Co. Ltd.	○	○	–	○	○	–	○	–	○
	Nippon Polytech Corp.	○	○	–	○	○	–	○	–	○
	Showa Denko Ceramics Co., Ltd,. (Toyama)	○	○	–	○	○	–	○	○	○
	Showa Denko Kenso Co., Ltd.	○	○	–	○	○	○	○	–	○
	Showa Fine Ceramics Co., Ltd.	○	○	–	○	○	–	–	–	○
	Showa Aluminum Can Corp.	○	○	–	○	○	○	○	○	○
	Showa Denko HD Yamagata K.K.	○	○	–	○	○	○	○	○	○
	Showa Denko Packaging Co., Ltd.	○	○	–	○	○	○	○	○ (Hikone Plant)	○
	Tsurusaki Kyodo Doryoku Co., Ltd.	○	○	–	–	–	–	–	–	○
	Showa Denko Electronics K.K.	○	○	○	–	–	–	–	–	○
	Niigata Showa K.K.	○	○	–	○	○	–	○	○	○
	SunAllomer Co., Ltd.	○	○	–	○	○	○	○	–	○ –
Outside Japan	Taiwan Showa Chemicals Manufacturing.co., Ltd. (including Showa Specialty Gas (Taiwan.) Co., Ltd.)		○	○	○	–	–	–	–	–
	Showa Denko Carbon Inc.		○	–	○	○	–	–	–	–
	SHOTIC Europa Industria de Aluminio Lda.		○		○	–	–	–	–	–
	SHOTIC MALAYSIA Sdn. Bhd.		○	–	○	○	–	–	–	–
	Showa Aluminum Manufacturing Philippines Corporation		○	–	○	○	–	–	–	–
	Showa Denko (Dalian) Co., Ltd.		○	–	○	–	–	–	–	–
	Showa Denko Aluminum (Nantong) Co., Ltd.		○	–	○	–	–	–	–	–
	Ganzhou Zhaori Rare Earth New Materials Co., Ltd.		○	–	○	–	–	–	–	–
	Showa Denko HD Singapore Pte Ltd.		○	○	○	–	–	–	–	–
	Showa Denko HD (Malaysia) Sdn. Bhd.		○	–	○	○	–	–	–	–
	Showa Denko HD Trace corp.		○	○	○	○	–	–	–	–
	Showa Denko Sichuan Carbon Inc.		○	○	○	–	–	–	–	–
	Zhejiag Quzhou Juhua Showa Electoronic Chemical Materials Co., Ltd.		○	–	○	–	–	–	–	–
	Showa Denko New Material (Zhejiag) Co., Ltd.		○	–	○	○	–	–	–	–
	Shanghai Showa Highpolymer Co., Ltd.		○	–	○	○	–	–	–	–
	SHOWA DENKO CARBON Products Germany GmbH & Co.KG		○	–	○	○	–	–	–	–
	SHOWA DENKO CARBON Spain S.A.		○	○	○	○	–	–	–	–
	SHOWA DENKO CARBON Malaysia Sdn. Bhd		○	–	○	○	–	–	–	–
	SHOWA DENKO CARBON Austria GmbH		○	–	○	○	–	–	–	–

Third-party Verification

We received the third-party verification about the quantitative data concerning our CSR performance shown in this SHOWA DENKO CSR Report 2019 from SGS Japan Inc.



Verification Statement

SGS

24 July 2019
Statement No : SGS19/026

Mr. Kohei Morikawa
President and CEO
SHOWA DENKO K.K

Objective

SGS Japan Inc. (hereinafter referred to as "SGS") was commissioned by SHOWA DENKO K.K (hereinafter referred to as "the Organization") to conduct independent verification based on Criteria of Verification (ISO14064-3: 2006 and the SGS verification protocol) regarding the performance data which reported in SHOWA DENKO Report 2019 calculated by the Organization on the scope of verification (hereinafter referred to as "the assertion"). The objective of this verification is to confirm that the assertion in the Organization's applicable scope has been correctly calculated and reported in the assertion in conformance with the criteria, and to express our views as a third party.

Scope

The scope of verification is Scope 1 and 2 and energy consumption, Scope3 (CO_2 emissions from the activities as a specified consigner within category 4), unit energy consumption for transport・freight ton-km・ratios for use of various modes of transport, the generation of industrial waste and the volume of final landfill waste, total amounts released of harmful atmospheric pollutants, release of PRTR-listed substances, the amount of water used・wastewater volume, discharged amounts of substances with atmospheric impact (SOx/NOx/Soot and dust), discharged amounts of substances with water quality impact (COD/Total nitrogen/Total phosphorus), Infrequency rate of lost-time injuries and Environmental accounting.
Refer to the attached sheet for details of the scope of verification.

Procedure of Verification

The assertion was verified in accordance with Criteria of Verification, and the following processes were implemented at a limited level of assurance:

- Verification of the calculation system: Interviews on the measurement, tabulation, calculation and reporting methods employed by the Organization as well as review of related documents and records
- Verification of the assertion: On-site verification and review of vouchers conducted at the Oita Complex and the Omachi Plant, and analytical procedures and interviews for other sites in the scope of verification carried out at the head office

The criteria for this review are based on the Act on the Rational Use of Energy, the GHG Emissions Calculation and Reporting Manual Ver.4.3 and the protocol specified by the Organization.

Conclusion

Within the scope of the verification activities employing the methodologies mentioned above, nothing has come to our attention that caused us to believe that the Organization's assertion was not calculated and reported in conformance with the criteria.
SGS Japan Inc. affirms our independence from the organization, being free from bias and conflicts of interest with the Organization.

For and on behalf of SGS Japan Inc
Senior Executive & Business Manager
Certification and Business Enhancement
Yuji Takeuchi

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/terms_and_conditions.htm.
Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.
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The Company's sole responsibility is to Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.
Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

attached sheet
Statement No : SGS19/026

The details of the scope of verification

The scope		The boundary
1	The performance data Scope 1 and 2 include stationary combustion, process emissions and non- CO_2 GHGs. Energy consumption	Stationary combustion: 53 production plants and research institutes in domestic and overseas group Process emissions and non- CO_2 GHGs: 19 production plants in domestic and overseas group
2	Scope3 (CO_2 emissions from the activities as a specified consigner within category 4) Unit energy consumption for transport・Freight ton-km・Ratios for use of various modes of transport	SHOWA DENKO K.K
3	The generation of industrial waste and the volume of final landfill waste	43 production plants and research institutes in domestic and overseas group
4	Total amounts released of harmful atmospheric pollutants	22 domestic group production plants and research institutes
5	Release of PRTR-listed substances	31 domestic group production plants and research institutes
6	The amount of water used・Wastewater volume	52 production plants and research institutes in domestic and overseas group
7	Discharged amounts of substances with atmospheric impact (SOx/NOx/Soot and dust)	21 domestic group production plants
8	Discharged amounts of substances with water quality impact (COD/Total nitrogen/Total phosphorus)	22 domestic group production plants and research institutes
9	Infrequency rate of lost-time injuries	34 domestic group production plants and research institutes
10	Environmental accounting	SHOWA DENKO K.K

The verification period of No 1 to 5 is from 1 April 2018 to 31 March 2019
The verification period of No 6 to 10 is from 1 January 2018 to 31 December 2018.

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Performance Data

Classification	Items	Boundaries	Units	2016	2017	2018	Report Number
Labor practices							
Number of employees	Male	Showa Denko K.K.	persons	3,244	3,198	2,919	—
	Female	Showa Denko K.K.	persons	403	418	428	—
	Total number of employees in Japan	Showa Denko K.K.	persons	3,647	3,616	3,347	02
	Male	Consolidated subsidiaries Japan	persons	5,385	5,345	5,079	—
	Female	Consolidated subsidiaries Japan	persons	690	742	764	—
	Total number of employees in Japan	Consolidated subsidiaries Japan	persons	6,075	6,087	5,843	—
	Male	Consolidated subsidiaries Japan	persons	2,963	3,599	3,526	—
	Female	Consolidated subsidiaries Japan	persons	1,108	1,178	1,107	—
	Total number of employees outside of Japan	Consolidated subsidiaries Japan	persons	4,071	4,777	4,633	—
	Total	Consolidated subsidiaries Japan	persons	10,146	10,864	10,476	02
Number of new employees	Male	Showa Denko K.K.	persons	78	78	84	—
	Female	Showa Denko K.K.	persons	18	14	22	—
	Total	Showa Denko K.K.	persons	96	92	106	—
Number of female managers		Showa Denko K.K.	persons	26	28	33	68
	Female managers ratio	Showa Denko K.K.	%	3.44	3.72	4.6	68
Ratio of reemployed employees		Showa Denko K.K.	%	89	83	79	69
Ratio of handicapped employees		Showa Denko K.K.	%	2.78	2.64	2.39	69
Working hours (per employee per year)		Showa Denko K.K.	hours	2,008.8	2,011.9	2,013.5	71
Annual paid holidays taken (per employee per year)		Showa Denko K.K.	days	13.6	13.8	13.6	71
Number of job separation (excluding retirement and permanent transfer)		Showa Denko K.K.	persons	68	72	59	—
Job separation rate (excluding retirement and permanent transfer)		Showa Denko K.K.	%	1.9	2.0	1.7	—
The average age		Showa Denko K.K.	age	40.1	40.0	39.9	—
The average length of continuous employment		Showa Denko K.K.	years	16.9	16.6	16.3	—
The average overtime work per employee per month		Showa Denko K.K.	hours	18.2	18.8	18.9	—
Childcare leave	Male	Showa Denko K.K.	persons	65	70	67	71
	Female	Showa Denko K.K.	persons	33	42	52	71
	Total	Showa Denko K.K.	persons	98	112	119	71
Family care leave	Male	Showa Denko K.K.	persons	1	2	0	71
	Female	Showa Denko K.K.	persons	1	1	0	71
	Total	Showa Denko K.K.	persons	2	3	0	71
Shortened working hours for childcare / family care	Male	Showa Denko K.K.	persons	1	0	0	71
	Female	Showa Denko K.K.	persons	54	33	45	—
	Total	Showa Denko K.K.	persons	55	33	45	—
Ratio of reinstated employees to those who took childcare leave		Showa Denko K.K.	%	100.0	100.0	100.0	—
Labor union	Number of unionized Employees	Showa Denko K.K.	persons	2,857	2,832	2,590	—
	Ratio of unionized Employees	Showa Denko K.K.	%	78.3	78.3	77.4	—
Number of incidents resulting in lost-time injuries		Showa Denko group	cases	3	7	4	62
Infrequency rate of lost-time injuries		Showa Denko K.K.		0.13	0.39	0.16	62
		Showa Denko group		0.15	0.22	0.07	62

*1: Include group companies detailer, a person of outside transfer *2: Including employees on loan

Classification	Items	Boundaries	Units	2016	2017	2018	Report Number
Environmental conservation							
Discharged amounts of greenhouse gases	Scope 1	Showa Denko K.K.	kt-CO_2	2,211	2,175	2,354	—
		Group companies in Japan	kt-CO_2	475	570	802	—
		Showa Denko group	kt-CO_2	2,686	2,745	3,156	—
	Scope 2	Showa Denko K.K.	kt-CO_2			210	—
		Group companies in Japan	kt-CO_2			200	—
		Showa Denko group	kt-CO_2			410	—
Transportation sector's CO_2 emissions			kt-CO_2	23.5	24.6	23.1	—
The amount of water used		Showa Denko K.K.	million m^3	5,411	5,460	5,229	59
		Group companies in Japan	million m^3	461	513	546	59
Wastewater volume		Showa Denko K.K.	thousand t	26,620	28,582	28,683	59
		Group companies in Japan	thousand t	3,733	4,475	4,293	59
The amount of industrial waste discharge		Showa Denko K.K.	t	20,038	24,166	28,797	60
		Group companies in Japan	t	9,360	13,145	13,512	60
Final landfill volumes of industrial waste		Showa Denko K.K.	t	254	356	314	60
		Group companies in Japan	t	69	92	66	60
Final landfill rate of industrial waste		Group companies in Japan	%	0.31	0.38	0.32	60
Release of PRTR-listed substances	Into air	Showa Denko K.K.	t	148	145	145	60
		Group companies in Japan	t	242	415	405	60
	Into water	Showa Denko K.K.	t	14	15	15	60
		Group companies in Japan	t	1	1	1	60
	Total	Showa Denko K.K.	t	163	160	160	60
		Group companies in Japan	t	243	416	406	60
Total amounts released of harmful atmospheric pollutants		Showa Denko K.K.	t	14	14	14	58
Discharged amounts of substances with atmospheric impact	SOx	Showa Denko K.K.	t	324	326	372	58
	NOx	Showa Denko K.K.	t	1,255	1,324	1,289	58
	Soot and dust	Showa Denko K.K.	t	63	71	65	58
Discharged amounts of substances with water quality impact	COD	Showa Denko K.K.	t	360	346	349	59
	Total phosphorus	Showa Denko K.K.	t	8	8	8	59
	Total nitrogen	Showa Denko K.K.	t	480	457	455	59
Environmental accounting	Total amount of capital investment	Showa Denko K.K.	million yen	1,962	1,560	2,708	55
	Total expenses	Showa Denko K.K.	million yen	2,651	3,488	3,815	55
	Economic benefits	Showa Denko K.K.	million yen	794	851	697	55
Quality Assurance	Annual numbers of complaints (With a score of 100 representing the number of claims in 2015)	Showa Denko K.K.	%	71	48	33	65

Classification	Items	Boundaries	Units	2016	2017	2018	Report Number
Corporate ethics and compliance							
Number of requests for consultation received by the Corporate Ethics Hotline		Showa Denko group	cases				41
	Sexual harassment/Powe harassment			15	26	24	41
	Violation of compliance			1	0	2	41
	Other			15	19	28	41
	Total			31	45	54	41
	Number of staff members dismissed due to noncompliance with the anti-bribery/ corruption policies			0	0	0	41
CSR procurement							
CSR visits			cases	38	39	39	43
Local community and social contribution							
Education	Dispatched employees as instructors	Showa Denko K.K.	cases	20	30	30	—
		Showa Denko K.K.	man-hours	716	768	673	—
	Accepted interns	Showa Denko K.K.	cases	28	31	31	—
		Showa Denko K.K.	persons	85	66	99	—
Improvement of the environment around the worksites	Cleaning activities	Showa Denko K.K.	cases	105	83	83	—
		Showa Denko K.K.	hours in total	5,906	5,215	5,631	—
Promotion of arts, culture and sports	Cooperation for and granting subsidies to arts, culture and sports: spend	Showa Denko K.K.	thousand yen	8,800	9,324	21,788	—
Exchange with local communities	Events	Showa Denko K.K.	persons	7,866	6,848	7,102	—
	Facilities rented	Showa Denko K.K.	hours	11,772	14,557	16,103	—
	Guided plant tours	Showa Denko K.K.	persons	7,524	6,697	9,512	—
Community development and social welfare	Harmonizing with local economy: spend	Showa Denko K.K.	thousand yen	2,110	2,132	1,488	—
	Aluminum can recycling: participation rate	Showa Denko K.K.	%	98.9	97.8	97.8	—
	Aluminum can recycling: proceeds	Showa Denko K.K.	thousand yen	888	1,343	1,347	—
	Collaborating with NPOs and local organizations: spend	Showa Denko K.K.	thousand yen	252	392	343	—

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Management's Discussion and Analysis

Results of Operations

The Group recorded consolidated net sales of ¥992,136 million (US$8,938 million) in 2018, up 27.1% from the previous year. The sales in the Electronics segment decreased due to a lower shipment volumes of HD media for mobile PCs. However, the sales in the Inorganics segment considerably increased due partly to the effect of the business integration in our graphite electrode business, which took place in the second half of 2017, and a rise in market prices of graphite electrodes. In the Petrochemicals segment, sales increased due to a rise in market prices of products resulting from a rise in raw naphtha price, despite a decrease in production resulting from the large-scale periodic shutdown maintenance of ethylene production facilities. Sales in the Chemicals, Aluminum, and Others segments also increased due to higher shipment volumes.

The cost of sales went up ¥102,115 million, or 16.9%, to ¥705,003 million (US$6,351 million), reflecting the increase in net sales.

Selling, general and administrative expenses rose ¥7,340 million, or 7.4%, to ¥107,130 million (US$965 million), due partly to the higher transportation cost. R&D expenditures rose ¥1,196 million to ¥19,735 million (US$178 million).

Operating income of the Group substantially increased by 131.6%, or ¥102,295 million over the previous year, to ¥180,003 million (US$1,622 million). In the Petrochemicals segment, operating income decreased due mainly to the large-scale shutdown maintenance. The Electronics and Aluminum segments also recorded lower income. However, the Inorganics segment recorded considerably higher income due to the effect of the business integration in graphite electrode business and a rise in the market prices of graphite electrodes. The Chemicals and Others segments also recorded higher income.

Information by Business Segment

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

Petrochemicals

Production of ethylene and propylene decreased from the previous year due to periodic shutdown maintenance of ethylene production facilities which is conducted once every four years. Sales of olefins rose due to a rise in the market prices of products resulting from a rise in raw naphtha price, despite a decrease in production quantities resulting from the large-scale periodic shutdown maintenance of ethylene production facilities. Sales of organic chemicals increased due to a rise in prices of products including ethyl acetate and vinyl acetate.

As a result, sales in the Petrochemicals segment increased ¥17,751 million, or 7.1% over the previous year, to ¥268,879 million (US$2,422 million). However, this segment recorded operating income of ¥20,333 million (US$183 million), down ¥13,024, or 39.0% from the previous year due mainly to the large-scale periodic shutdown maintenance and a decrease in spreads between raw naphtha price and market prices of cracked fuel oil and the raw material for butadiene.

Chemicals

Production of liquefied ammonia decreased slightly from the previous year. However, production of high-purity gases for electronics increased. In the basic chemicals business, sales of liquefied ammonia dropped slightly due to a decrease in shipment volumes. However, sales of acrylonitrile and chloroprene rubber increased due to a rise in market prices. Sales of electronic chemicals went up due to higher shipment volumes of high-purity gases for electronics caused by an increase in production in the semiconductor and display panel industries. Sales of industrial gases increased due to higher shipment volumes of carbon dioxide and dry ice. Sales of functional chemicals also rose due to higher sales prices of products reflecting a rise in prices of raw materials.

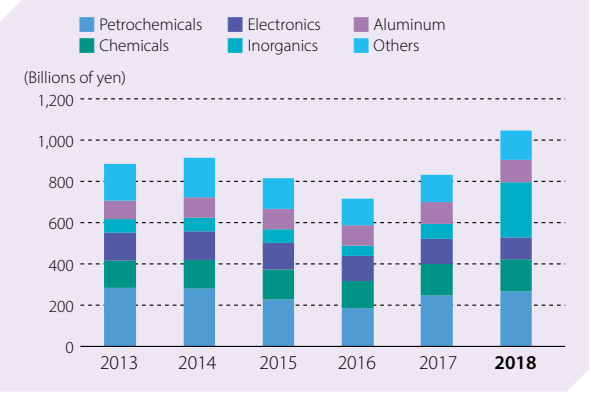
As a result, sales in the Chemicals segment increased ¥7,782 million, or 5.2% over the previous year, to ¥156,541 million (US$1,410 million). The segment recorded operating income of ¥17,393 million (US$157 million), up ¥919 million, or 5.6% over the previous year.

Electronics

Production of HD media in 2018 fell from the previous year due mainly to a weakness in shipment volumes of HD media for use in PCs, though the demand for HD media for use in servers for data centers remained strong. Thus the sales of HD media dropped, reflecting a decrease in sales volumes. Sales of compound semiconductors increased due to higher shipment volumes. However, sales of rare earth magnetic alloys fell due to reforms in business structure. Sales of lithium-ion battery (LIB) materials increased due to higher shipment volumes to China.

As a result, the Electronics segment's sales decreased ¥17,241 million, or 14.0% from the previous year, to ¥105,823 million (US$953 million). The segment recorded operating income of ¥12,397 million (US$112 million), down ¥9,528 million, or 43.5% from the previous year.

Net Sales by Segment



Inorganics

Production of graphite electrodes increased from the previous year due to a rise in output from the electric steel industry as the customer. Sales of graphite electrodes went up sharply due to consolidation of SHOWA DENKO CARBON Holding GmbH in the second half of 2017, in addition to a rise in sales prices of graphite electrodes in the global market caused by higher production of electric steel in China resulting from enforcement of stricter environmental policy, and the tight supply demand situation resulting from an electric steel production on a global scale, especially in the U.S. market. Sales of ceramics decreased due mainly to a fall in shipment volumes of general-purpose alumina caused by SDK's withdrawal from PT. Indonesia Chemical Alumina (ICA), despite higher shipment volumes of abrasives and fine ceramics for electronics.

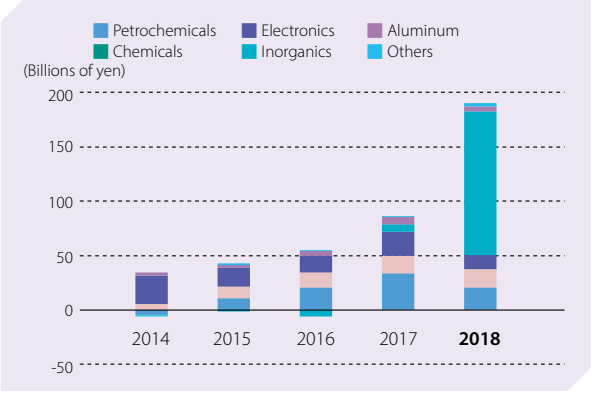
As a result, sales in the Inorganics segment increased ¥192,707 million, or 262.4% over the previous year, to ¥266,149 million (US$2,398 million). This segment recorded operating income of ¥132,445 million (US$1,193 million), up ¥125,466 million over the previous year.

Aluminum

Production of high-purity foil for aluminum electrolytic capacitors increased from the previous year. Sales of rolled products went up due to higher shipment volumes of high-purity foil for aluminum electrolytic capacitors for use in industrial equipment and automotive applications. Sales of aluminum specialty components increased slightly due to a rise in product prices caused by higher price of aluminum ingots. Sales of aluminum cans slightly fell due to lower shipment volumes to the domestic market.

As a result, sales in the Aluminum segment increased ¥2,815 million, or 2.7% over the previous year, to ¥108,254 million (US$975 million). However, operating income of the segment decreased ¥1,755 million, or 26.2% from the previous year, to ¥4,942 million (US$45 million).

■ Operating Income by Segment



Others

Sales in the Others segment increased ¥9,789 million, or 7.3% over the previous year, to ¥143,413 million (US$1,292 million) due mainly to the increase in Shoko Co., Ltd.'s sales and shipment volumes of SiC epitaxial wafers for power devices. Operating income of the segment rose by ¥2,260 million, or 357.0% over the previous year, to ¥2,893 million (US$26 million).

Information by Geographic Area

Sales in Japan

Sales in the Petrochemicals segment increased due to a rise in market prices of products resulting from higher raw naphtha prices. Sales in the Chemicals segment went up due to an increase in shipment volumes of high-purity gases for electronics caused by a production increase in the semiconductor and display panel industries and a rise in the market price of acrylonitrile. Sales figures of the Electronics segment fell due to lower shipment volumes of HD media, despite increased shipment volumes and sales of compound semiconductors. In the Inorganics segment, sales rose due to an increase in market prices and sales volumes of graphite electrodes, and an increase in shipment volumes of ceramics for electronics including titanium oxide and thermoconductive fillers. Sales in the Aluminum segment rose due to higher sales volumes of high-purity foil for aluminum electrolytic capacitors and an increase in sales of aluminum specialty components resulting from a rise in price of aluminum ingots. Sales figures of the Others segment rose due to an increase in Shoko Co., Ltd.'s sales and higher shipment volumes of SiC epitaxial wafers, for which we have been increasing our productive capacity. As a result, consolidated sales from operations in Japan rose ¥47,170 million, or 9.4%, to ¥551,333 million (US$4,967 million).

Sales in Asia (excluding Japan)

Sales in the Petrochemicals segment in Asia fell due to a decline in the export of olefins resulting from periodic shutdown maintenance of ethylene production facilities conducted once every four years. Sales in Asia for the Chemicals segment increased. For the basic chemicals business, sales of chloroprene rubber rose due to an increase in export volumes. For the electronic chemicals business, sales went up due to an increase in shipment volumes of high-purity gases for electronics caused by higher production in the semiconductor and display panel industries in East Asia. For the functional chemicals business, sales increased due to a rise in market prices of products resulting from a rise in raw material prices. The Electronics segment's sales went down due to lower shipment volumes of HD media resulting from a decline in demand for HDDs used in PCs. Sales in the Inorganics segment rose due mainly to a rise in prices of graphite electrodes in the global market and the full-year contribution from SHOWA DENKO CARBON Holding GmbH, which was consolidated in the fourth quarter of 2017, to the increase in sales. Sales in the Aluminum segment increased due to higher shipment volumes of aluminum cans recorded by Hanacans Joint Stock Company in Vietnam. Sales in the Others segment decreased due to lower sales recorded by Shoko Co., Ltd.

Management's Discussion and Analysis

As a result, consolidated sales from operations in Asia (excluding Japan) increased ¥9,241 million, or 4.0% over the previous year, to ¥239,885 million (US$2,161 million).

Sales in the Rest of the World

Sales in the rest of the world increased substantially due mainly to a rise in sales in the Inorganics segment. Showa Denko Carbon Inc., our U.S. subsidiary producing graphite electrodes, recorded higher sales due mainly to a rise in graphite electrode prices in the global market. SHOWA DENKO CARBON Holding GmbH, which was consolidated in the fourth quarter of 2017, also contributed to the increase in sales in the Inorganics segment throughout 2018.
As a result, consolidated sales from operations in the rest of the world increased ¥155,338 million, or 340.8% over the previous year, to ¥200,919 million (US$1,810 million).

Other Income (Expenses) and Net Income Attributable to Owners of the Parent

The gap between interest expenses and interest and dividends income improved ¥578 million to expenses of ¥629 million (US$6 million), mainly from an increase in interest income.

We recorded a gain on the equity in earnings of unconsolidated subsidiaries and affiliates to which the equity method is applied of ¥1,253 million (US$11 million), an improvement of ¥8,942 million. This gain was due mainly to a backlash from the previous year's recording of an impairment loss on the equity in earnings of unconsolidated subsidiaries and affiliates to which the equity method is applied from ICA.

For foreign exchange gain (losses), the Group recorded foreign exchange losses of ¥347 million (US$3 million) in 2018, an improvement of ¥2,444 million from the previous year due mainly to the recording of a foreign exchange gain from a subsidiary manufacturing HD media in Taiwan caused by the depreciation of the New Taiwan dollar against the U.S. dollar. In 2017, however, this HD media manufacturing subsidiary in Taiwan recorded foreign exchange losses due to the appreciation of the New Taiwan dollar against the U.S. dollar.

We recorded a loss of ¥4,993 million (US$45 million), net, on retirement and sales of non-current assets, an increase of ¥563 million, due mainly to the recording of retirement losses resulting from removal of old facilities that belonged to the Inorganics, Chemicals, and Petrochemicals segments.

We also recorded a loss of ¥22,573 million (US$203 million) for the impairment loss on fixed assets, an increase of ¥15,369 million, due partly to our recognition of an impairment loss amounting to ¥8,845 million from the business to manufacture aluminum can for beverages operated by SDK and Showa Aluminum Can Corporation, our consolidated subsidiary, and another impairment loss amounting to ¥4,641 million from the business to manufacture lithium-ion battery materials, as a result of our review on the value of businesses taking their business perspectives into consideration. In addition, we recorded impairment loss amounting to ¥5,967 million and ¥1,864 million on idle properties: the Hikone Plant and the Institute for Advanced and Core Technology.

Gain on sales of investment securities increased ¥1,113 million, to ¥1,521 million (US$14 million).

The sum of extraordinary losses, other than those mentioned above, decreased ¥1,792 million from the previous year, to ¥7,626 million (US$69 million), which was due mainly to posting of a loss on valuation of investment securities.

Overall, the total of other income (expenses), net, i.e., the total of non-operating income (expenses) and extraordinary income (expenses), net, deteriorated by ¥7,317 million, to a loss of ¥34,494 million (US$311 million).

As a result, the Company recorded income before income taxes and non-controlling interests of ¥145,509 million (US$1,311 million), up ¥94,978 million from the previous year.

Income taxes increased ¥17,942 million to ¥28,756 million (US$259 million) due to the improvement in the Company's performance. Consequently, the Company recorded net income attributable to owners of the parent of ¥111,503 million (US$1,005 million), up ¥74,099 million over the previous year.

Financial Position

Total Assets

Total assets at the end of 2018 rose ¥48,747 million from the end of the previous year, to ¥1,075,746 million (US$9,691 million), due mainly to the increase in notes and accounts receivable and inventories resulting from a rise in product and raw material prices in our graphite electrode business. Cash and deposits increased ¥35,938 million from the end of the previous year to ¥113,186 million (US$1,020 million).

Net property, plant and equipment decreased ¥27,527 million to ¥478,406 million (US$4,310 million), due mainly to the recording of impairment loss. Total investments and other assets decreased by ¥16,812 million, to ¥97,060 million (US$874 million), due partly to the depreciation in the market valuation of investment securities.

Liabilities

Interest-bearing debt fell ¥58,758 million from the end of the previous year, to ¥287,968 million (US$2,594 million), despite an increase in accounts payable-trade caused by a rise in prices of raw materials for graphite electrodes. Total liabilities fell ¥47,599 million, to ¥610,406 million (US$5,499 million).

Net Assets

Net assets at the end of 2018 amounted to ¥465,340 million (US$4,192 million), up ¥96,346 million over the previous year, due partly to the posting of net income attributable to owners of the parent.

Capital Expenditures

Capital expenditures decreased ¥60 million from the previous year, to ¥41,727 million (US$376 million). Capital expenditures for the Petrochemicals segment increased due to periodic shutdown maintenance, and that for the Others segment increased due to investment in facilities to produce SiC epitaxial wafers for power devices.

However, in the Chemicals segment, the amount of capital investment in the electronic chemicals business decreased due to the end of largescale investment in facilities in 2017 to produce etching gases, though the amount of capital investment continued to be at a high level throughout 2018. In the Electronics segment, investment in facilities to produce HD media in 2018 decreased from the previous year.

Cash Flows

Net cash provided by operating activities increased ¥82,550 million over the previous year to proceeds of ¥149,785 million (US$1,349 million), due mainly to the increase in net income attributable to owners of the parent. Net cash used in investing activities increased ¥19,472 million, to ¥49,338 million (US$444 million), due partly to a decrease in proceeds from repayment of time deposits. Thus, free cash flow ended up with the proceeds of ¥100,447 million (US$905 million), an improvement of ¥63,078 million. Net cash used in financing activities increased ¥42,691 million due to the reduction in interest-bearing debt, and ended up with the payment of ¥61,061 million (US$550 million). As a result, and due partly to the influence of exchange rate fluctuations, cash and cash equivalents at December 31, 2018 increased ¥36,002 million from the end of the previous year, to ¥112,835 million (US$1,017 million).

Consolidated financial statements

Consolidated Balance Sheets

At December 31, 2018 and 2017

	Millions of yen		Thousands of U.S. dollars
ASSETS	**2018**	2017	**2018**
Current assets			
Cash and deposits	**¥113,186**	¥77,248	**$1,019,692**
Notes and accounts receivable	**217,200**	194,404	**1,956,761**
Allowance for doubtful accounts	**(1,386)**	(2,849)	**(12,482)**
Inventories	**152,800**	114,913	**1,376,581**
Deferred tax assets	**3,747**	6,898	**33,760**
Other current assets	**14,732**	16,581	**132,717**
Total current assets	**500,280**	407,194	**4,507,029**
Property, plant and equipment			
Land	**234,987**	244,713	**2,117,002**
Buildings and structures	**283,303**	287,708	**2,552,281**
Machinery, equipment and vehicles	**900,921**	900,779	**8,116,403**
Construction in progress	**11,106**	16,548	**100,054**
	1,430,317	1,449,748	**12,885,740**
Less : Accumulated depreciation	**(951,911)**	(943,815)	**(8,575,776)**
Net property, plant and equipment	**478,406**	505,933	**4,309,964**
Investments and other assets			
Investment securities	**71,886**	89,167	**647,618**
Long-term loans	**71**	1,217	**643**
Net defined benefit asset	**249**	232	**2,243**
Deferred tax assets	**1,590**	1,080	**14,320**
Other	**31,596**	32,405	**284,650**
Allowance for doubtful accounts	**(8,332)**	(10,229)	**(75,062)**
Total investments and other assets	**97,060**	113,871	**874,412**
Total assets	**¥1,075,746**	¥1,026,999	**$9,691,405**

See notes to financial statements.

	Millions of yen		Thousands of U.S. dollars
LIABILITIES AND NET ASSETS	**2018**	2017	**2018**
Current liabilities			
Short-term debt	**¥81,747**	¥91,699	**$736,456**
Current portion of long-term debt	**41,403**	57,432	**373,000**
Notes and accounts payable	**182,890**	171,515	**1,647,662**
Income taxes payable	**10,160**	5,748	**91,535**
Provision for repairs	**64**	4,143	**574**
Provision for bonuses	**3,516**	2,949	**31,678**
Provision for stock payments	**5**	5	**46**
Provision for business structure improvement	**129**	137	**1,161**
Other current liabilities	**42,266**	38,206	**380,775**
Total current liabilities	**362,181**	371,835	**3,262,888**
Noncurrent liabilities			
Long-term debt less current portion	**164,818**	197,594	**1,484,847**
Deferred tax liabilities	**6,683**	12,880	**60,211**
Provision for repairs	**1,102**	117	**9,926**
Provision for director retirement	**156**	96	**1,407**
Provision for business structure improvement	**2,876**	3,574	**25,906**
Provision for loss on guarantees	**—**	2,640	**—**
Net defined benefit liability	**22,018**	18,966	**198,365**
Deferred tax liabilities for land revaluation	**32,324**	32,488	**291,208**
Other noncurrent liabilities	**18,248**	17,814	**164,397**
Total noncurrent liabilities	**248,226**	286,170	**2,236,266**
Contingent liabilities			
Net assets			
Shareholders' equity			
Capital stock			
Authorized, 330,000,000 shares			
Issued , 2018– 149,711,292 shares	**140,564**	—	**1,266,338**
Issued , 2017– 149,711,292 shares	**—**	140,564	**—**
Capital surplus	**78,911**	61,663	**710,911**
Retained earnings	**197,717**	100,076	**1,781,230**
Less: Treasury stock at cost, 2018– 3,836,364 shares	**(11,659)**	—	**(105,038)**
Less: Treasury stock at cost, 2017– 7,187,545 shares	**—**	(10,503)	**—**
Total shareholders' equity	**405,532**	291,800	**3,653,441**
Accumulated other comprehensive income			
Valuation difference on available-for-sale securities	**7,489**	16,547	**67,465**
Deferred gains or losses on hedges	**836**	3,781	**7,535**
Revaluation reserve for land	**33,281**	29,541	**299,831**
Foreign currency translation adjustments	**7,069**	15,516	**63,681**
Remeasurements of defined benefit plans	**(8,244)**	(4,716)	**(74,270)**
Total accumulated other comprehensive income	**40,431**	60,670	**364,241**
Non-controlling interests	**19,377**	16,524	**174,568**
Total net assets	**465,340**	368,994	**4,192,251**
Total liabilities and net assets	**¥1,075,746**	¥1,026,999	**$9,691,405**

Consolidated financial statements

Consolidated Statements of Income

For the years ended December 31, 2018 and 2017

	Millions of yen		Thousands of U.S. dollars
	2018	2017	**2018**
Net sales	**¥992,136**	¥780,387	**$8,938,162**
Cost of sales	**705,003**	602,888	**6,351,379**
Gross profit	**287,133**	177,498	**2,586,784**
Selling, general and administrative expenses	**107,130**	99,790	**965,135**
Operating income	**180,003**	77,708	**1,621,649**
Other income (expenses)			
Interest and dividends income	**2,354**	1,893	**21,207**
Equity in earnings (losses) of unconsolidated subsidiaries and affiliates	**1,253**	(7,689)	**11,290**
Gain on sales of investment securities, net	**1,521**	408	**13,703**
Loss on valuation of investment securities	**(2,583)**	(50)	**(23,270)**
Rent income on non-current assets	**1,366**	1,381	**12,305**
Interest expenses	**(2,983)**	(3,100)	**(26,871)**
Loss on retirement of non-current assets	**(4,851)**	(5,310)	**(43,706)**
Impairment loss	**(22,573)**	(7,204)	**(203,362)**
Gain on bargain purchase	**—**	7,141	**—**
Gain on liquidation of subsidiaries	**361**	15	**3,254**
Provision for loss on guarantees	**—**	(2,640)	**—**
Other, net	**(8,359)**	(12,022)	**(75,309)**
Total	**(34,494)**	(27,177)	**(310,759)**
Income before income taxes and non-controlling interests	**145,509**	50,531	**1,310,890**
Income taxes			
Current	**25,669**	8,053	**231,255**
Deferred	**3,087**	2,761	**27,813**
Net income	**116,752**	39,717	**1,051,823**
Net income attributable to non-controlling interests	**5,249**	2,313	**47,287**
Net income attributable to owners of the parent	**¥111,503**	¥37,404	**$1,004,535**

	Yen		U.S. dollars
Per share amounts			
Net income – primary	**¥758.15**	¥262.44	**$6.83**
Cash dividends (applicable to the period)	**120.00**	80.00	**1.08**

Note: Net income per share has been computed based on the average number of shares of common stock outstanding during the respective fiscal year.
Diluted net income per share for 2018 and 2017 were not disclosed because there were no dilutive shares.
See notes to financial statements.

Consolidated Statements of Comprehensive Income

For the years ended December 31, 2018 and 2017

	Millions of yen		Thousands of U.S. dollars
	2018	2017	**2018**
Net income	**¥116,752**	¥39,717	**$1,051,823**
Other comprehensive income:			
Valuation difference on available-for-sale securities	**(9,127)**	12,133	**(82,228)**
Deferred gains or losses on hedges	**(2,942)**	3,479	**(26,508)**
Foreign currency translation adjustments	**(7,667)**	1,519	**(69,070)**
Remeasurements of defined benefit plans, net of tax	**(3,556)**	6,294	**(32,034)**
Share of other comprehensive income of unconsolidated subsidiaries and affiliates accounted for using equity method	**(1,405)**	22	**(12,655)**
Total other comprehensive income (loss)	**¥(24,697)**	¥23,447	**$(222,495)**
Comprehensive income	**¥92,055**	¥63,165	**$829,327**
Comprehensive income attributable to:			
Owners of parent	**87,463**	60,579	**787,953**
Non-controlling interests	**4,593**	2,586	**41,375**

See notes to financial statements.

Consolidated financial statements

Consolidated Statements of Changes in Net Assets

For the years ended December 31, 2018 and 2017

	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	Non-controlling interests	Total net assets
Balance at December 31, 2016	149,711	¥140,564	¥62,033	¥65,358	¥(10,502)	¥4,519	¥320	¥31,026	¥14,239	¥(10,996)	¥14,671	¥311,231
Dividends from surplus	—	—	—	(4,285)	—	—	—	—	—	—	—	(4,285)
Net income (loss) attributable to owners of the parent	—	—	—	37,404	—	—	—	—	—	—	—	37,404
Purchase of treasury stock	—	—	—	—	(11)	—	—	—	—	—	—	(11)
Disposal of treasury stock	—	—	0	—	10	—	—	—	—	—	—	10
Increase by increase of consolidated subsidiaries	—	—	—	229	—	—	—	—	—	—	—	229
Decrease by increase of consolidated subsidiaries	—	—	—	(97)	—	—	—	—	—	—	—	(97)
Change of scope of the equity method	—	—	—	—	—	—	—	—	—	—	—	—
Change in treasury shares of parent arising from transactions with non-controlling shareholders	—	—	(370)	—	—	—	—	—	—	—	—	(370)
Reversal of revaluation reserve for land	—	—	—	1,486	—	—	—	—	—	—	—	1,486
Other	—	—	—	(20)	—	—	—	—	—	—	—	(20)
Net changes of items other than shareholders' equity	—	—	—	—	—	12,028	3,461	(1,485)	1,277	6,281	1,854	23,416
Balance at December 31, 2017	149,711	¥140,564	¥61,663	¥100,076	¥(10,503)	¥16,547	¥3,781	¥29,541	¥15,516	¥(4,716)	¥16,524	¥368,994
Dividends from surplus	**—**	**—**	**—**	**(10,117)**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**(10,117)**
Net income (loss) attributable to owners of the parent	**—**	**—**	**—**	**111,503**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**111,503**
Purchase of treasury stock	**—**	**—**	**—**	**—**	**(10,015)**	**—**	**—**	**—**	**—**	**—**	**—**	**(10,015)**
Disposal of treasury stock	**—**	**—**	**17,248**	**—**	**8,859**	**—**	**—**	**—**	**—**	**—**	**—**	**26,107**
Increase by increase of consolidated subsidiaries	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Decrease by increase of consolidated subsidiaries	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Change of scope of the equity method	**—**	**—**	**—**	**(6)**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**(6)**
Change in treasury shares of parent arising from transactions with non-controlling shareholders	**—**	**—**	**0**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**0**
Reversal of revaluation reserve for land	**—**	**—**	**—**	**(3,740)**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**(3,740)**
Other	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Net changes of items other than shareholders' equity	**—**	**—**	**—**	**—**	**—**	**(9,058)**	**(2,945)**	**3,740**	**(8,447)**	**(3,528)**	**2,853**	**(17,387)**
Balance 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**

	Thousands	Thousands of U.S. dollars (Note 4)										
	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	Non-controlling interests	Total net assets
Balance at December 31, 2017	149,711	$1,266,338	$555,523	$901,583	$(94,619)	$149,072	$34,067	$266,138	$139,783	$(42,484)	$148,869	$3,324,270
Dividends from surplus	**—**	**—**	**—**	**(91,144)**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**(91,144)**
Net income (loss) attributable to owners of the parent	**—**	**—**	**—**	**1,004,535**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**1,004,535**
Purchase of treasury stock	**—**	**—**	**—**	**—**	**(90,229)**	**—**	**—**	**—**	**—**	**—**	**—**	**(90,229)**
Disposal of treasury stock	**—**	**—**	**155,387**	**—**	**79,810**	**—**	**—**	**—**	**—**	**—**	**—**	**235,197**
Increase by increase of consolidated subsidiaries	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Decrease by increase of consolidated subsidiaries	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Change of scope of the equity method	**—**	**—**	**—**	**(51)**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**(51)**
Change in treasury shares of parent arising from transactions with non-controlling shareholders	**—**	**—**	**1**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**1**
Reversal of revaluation reserve for land	**—**	**—**	**—**	**(33,693)**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**(33,693)**
Other	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**
Net changes of items other than shareholders' equity	**—**	**—**	**—**	**—**	**—**	**(81,607)**	**(26,532)**	**33,693**	**(76,102)**	**(31,786)**	**25,699**	**(156,635)**
Balance at December 31, 2018	**149,711**	**$1,266,338**	**$710,911**	**$1,781,230**	**$(105,038)**	**$67,465**	**$7,535**	**$299,831**	**$63,681**	**$(74,270)**	**$174,568**	**$4,192,251**

See notes to financial statements.

Consolidated Statements of Cash Flows

For the years ended December 31, 2018 and 2017

	Millions of yen		Thousands of U.S. dollars
	2018	2017	**2018**
Cash flows from operating activities			
Income before income taxes and non-controlling interests	**¥145,509**	¥50,531	**$1,310,890**
Adjustments for:			
Depreciation and amortization	**39,459**	38,565	**355,489**
Impairment loss	**22,573**	7,204	**203,362**
Amortization of negative goodwill	**(19)**	(12)	**(167)**
Increase (decrease) in allowance for doubtful accounts	**(2,134)**	2,757	**(19,224)**
Increase (decrease) in provision for business restructuring	**(704)**	2,106	**(6,339)**
Increase (decrease) in provision for loss on guarantees	**(2,640)**	2,640	**(23,783)**
Increase (decrease) in net defined benefit liability	**3,522**	(10,610)	**31,732**
Interest and dividends income	**(2,354)**	(1,893)	**(21,207)**
Interest expenses	**2,983**	3,100	**26,871**
Equity in (earnings) losses of unconsolidated subsidiaries and affiliates	**(1,253)**	7,689	**(11,290)**
Loss (gain) on sales and valuation of investment securities	**1,062**	(358)	**9,567**
Loss on retirement of non-current assets	**4,851**	5,310	**43,706**
Loss (gain) on sales of non-current assets	**141**	(880)	**1,274**
Decrease (increase) in notes and accounts receivable-trade	**(29,583)**	(23,253)	**(266,509)**
Decrease (increase) in inventories	**(40,469)**	(12,005)	**(364,587)**
Increase (decrease) in notes and accounts payable-trade	**20,397**	10,172	**183,757**
Other, net	**6,162**	(8,712)	**55,518**
Subtotal	**167,506**	72,351	**1,509,060**
Interest and dividends income received	**4,005**	4,410	**36,085**
Interest expenses paid	**(4,269)**	(2,828)	**(38,459)**
Income taxes paid (refund)	**(17,457)**	(6,698)	**(157,270)**
Net cash provided by (used in) operating activities	**149,785**	67,235	**1,349,415**
Cash flows from investing activities			
Payments into time deposits	**(172)**	(9,606)	**(1,547)**
Proceeds from withdrawal of time deposits	**210**	23,268	**1,890**
Purchase of property, plant and equipment	**(41,269)**	(38,872)	**(371,792)**
Proceeds from sales of property, plant and equipment	**392**	1,067	**3,528**
Purchase of investment securities	**(703)**	(1,646)	**(6,337)**
Proceeds from sales of investment securities	**3,975**	15,086	**35,811**
Purchase of investments in subsidiaries resulting in change in scope of consolidation	**—**	(14,827)	**—**
Net decrease (increase) in short-term loans receivable	**197**	(754)	**1,776**
Payments of long-term loans receivable	**(2,950)**	(1,045)	**(26,575)**
Collection of long-term loans receivable	**672**	609	**6,058**
Other, net	**(9,690)**	(3,145)	**(87,300)**
Net cash provided by (used in) investing activities	**(49,338)**	(29,866)	**(444,487)**
Cash flows from financing activities			
Net increase (decrease) in short-term debt	**(9,507)**	19,921	**(85,647)**
Proceeds from long-term loans payable	**33,206**	22,328	**299,149**
Repayments of long-term loans payable	**(81,559)**	(44,813)	**(734,768)**
Redemption of bonds	**—**	(10,000)	**—**
Purchase of treasury stock	**(10,016)**	(12)	**(90,238)**
Proceeds from sales of treasury stock	**26,104**	0	**235,172**
Cash dividends paid	**(10,084)**	(4,277)	**(90,847)**
Cash dividends paid to non-controlling shareholders	**(2,365)**	(1,648)	**(21,302)**
Other, net	**(6,840)**	130	**(61,622)**
Net cash provided by (used in) financing activities	**(61,061)**	(18,370)	**(550,104)**
Effect of exchange rate changes on cash and cash equivalents	**(3,231)**	953	**(29,108)**
Net increase (decrease) in cash and cash equivalents	**36,154**	19,952	**325,716**
Cash and cash equivalents at beginning of the year	**76,833**	56,186	**692,193**
Increase in cash and cash equivalents resulting from newly consolidated subsidiaries	**—**	696	**—**
Decrease in cash and cash equivalents resulting from change in scope of consolidation	**(153)**	—	**(1,377)**
Cash and cash equivalents at end of the year	**¥112,835**	¥76,833	**$1,016,532**

See notes to financial statements.

Stocks information

(As of June 30, 2019)

Stocks information

Authorized number of shares 330,000,000

Number of Shares Outstanding	149,711,292
Number of Shareholders	75,333

SDK consolidated every ten 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.(T)	9,866	6.75
Japan Trustee Services Bank, Ltd.(T)	7,260	4.97
Fukoku Mutual Life Insurance Company	4,517	3.09
The Dai-ichi Life Insurance Company,Limited	3,600	2.46
Japan Trustee Services Bank, Ltd.(T9)	3,215	2.20
Meiji Yasuda Life Insurance Company	2,645	1.81
Japan Trustee Services Bank, Ltd.(T5)	2,554	1.75
GOLDMAN SACHS INTERNATIONAL	2,432	1.66
INDUS JAPAN LONG ONLY MASTER FUND, LTD	2,397	1.64
Japan Trustee Services Bank, Ltd.(T7)	2,172	1.49

Note: Each rate of shareholding was calculated after deducting the number of treasury shares (6,897 thousand) from the number of shares outstanding.

Shareholders (unit: 1,000 shares)

