SHOWA DENKO K.K.

Consolidated Financial Statements

For the year ended December 31, 2019

Ⅰ. Consolidated Financial Results

Feb. 13th, 2020

(¥ in millions, US$ in thousands, except for net income attributable to owners of the parent per share)

(1) Results of operations:

	Results for the year ended December 31			
	2018	2019	Increase (Decrease)	2019
	¥	¥	%	$
Net sales	992,136	906,454	(8.6)	8,273,583
Operating income	180,003	120,798	(32.9)	1,102,574
Ordinary income	178,804	119,293	(33.3)	1,088,836
Net income attributable to owners of the parent	111,503	73,088	(34.5)	667,108
Net income attributable to owners of the parent per share: Basic	758.15	501.03	—	4.57
Net income attributable to owners of the parent per share: Diluted	—	—	—	—
	%	%		
Net income on equity	27.9	15.5		
Ordinary income on total assets	17.0	11.1		
Operating income to net sales	18.1	13.3		

Notes

Important changes in accounting policies : not applicable

Comprehensive income:

Results for the year ended December 31,2019 ¥ 77,308 million

Results for the year ended December 31,2018 ¥ 92,055 million

(2) Financial position:

(¥ in millions, US$ in thousands, except for net income per share)

	Dec. 31, 2018	Dec. 31, 2019	Dec. 31, 2019
	¥	¥	$
Total assets	1,074,983	1,076,381	9,824,584
Total equity	465,340	519,433	4,741,082
Total equity per share	3,057.16	3,423.25	31.25
	%	%	%
Stockholders' equity ratio	41.5	46.4	46.4

(3) Cash flows:

(¥ in millions, US$ in thousands)

	Results for the year ended December 31		
	2018	2019	2019
	¥	¥	$
Cash flows from operating activities	149,785	78,554	716,991
Cash flows from investing activities	(49,338)	(48,156)	(439,542)
Cash flows from financing activities	(61,061)	(18,546)	(169,276)
Cash and cash equivalents at end of the year	112,835	121,734	1,111,118

(4) Dividends:

	2018	2019	2020 forecast
End of Q1 dividends per share (¥)	—	—	—
End of Q2 dividends per share (¥)	20	50	60
End of Q3 dividends per share (¥)	—	—	—
End of Term dividends per share (¥)	100.0	80.0	70.0
Total of dividend per share above (¥)	120.0	130.0	130.0
Total dividends (¥ in millions)	17,593	19,001	—
	%	%	%
Payout ratio (consolidated)	15.8	25.9	126.4
Net assets dividend yield (consolidated)	4.3	4.0	—

Ⅱ. Forecast of performance for the year ending December 31, 2020

(¥ in millions, US$ in thousands, except for net income per share)

	1st half		fiscal year	
	¥	$	¥	$
Net sales	370,000	3,377,145	810,000	7,393,209
Operating income	9,000	82,147	50,000	456,371
Ordinary income	7,000	63,892	47,000	428,989
Net income attributable to owners of the parent	−2,000	−18,255	15,000	136,911
Net income attributable to owners of the parent per share: Basic	−13.71	−0.13	102.83	0.94

※The above forecast is based on the information available at this point of time. Actual results may differ materially due to a variety of reasons, including such economic factors as fluctuations in foreign currency exchange rates as well as market supply and demand conditions.

Notes

＊ The U.S. dollar is valued at ¥109.56 throughout this statement for convenience only.

[Business Results and Financial Conditions]

1. Analysis of business results

(1) Summary

In 2019, the Japanese economy continued to recover gradually. Consumer spending remained firm against the background of good employment situation. However, corporate earnings showed downward trend centering on manufacturing industry due to a decrease in domestic production and export caused by business slowdown in China. Overseas economies were slowing down. Though the US economy continued to recover gradually, a feeling of slowdown of the European economy was strengthened. Chinese economy was slowing down due to US-China trade friction, and it is desired that measures to stimulate the slowing down economy taken by relevant authorities be fully effective. The economies of ASEAN countries also showed a sign of slowdown. Harsh environment for global economy continued due to global issues such as prolonged adjustment of production in the semiconductor industry, and lowering production in the automotive industry centering on Europe and China, in addition to the US-China trade friction and the unstable situation in the Middle East.

In the petrochemicals industry, domestic plants to produce ethylene and its derivatives maintained high operating rate. However, in the East Asian market, the supply-demand situation of petrochemicals was slightly eased due to a slowdown in the Chinese economy. The electronics parts/materials industry continued to show low-level shipment volumes due to harsh adjustment of production in the semiconductor and display panel sectors.

Under these circumstances, the Showa Denko Group has been promoting its medium-term consolidated business plan “The TOP 2021” since January 2019. It is very important for the Showa Denko Group to enhance the value of the Group and satisfy all stakeholders including shareholders, customers, suppliers, local communities and employees in order that the Group continuously grows and becomes trusted and acclaimed by society. The Showa Denko Group defines this idea as the Group’s business philosophy, thereby promoting management to maximize shareholders’, customers’ and social value. The Group will strengthen its earning power and reduce the range of fluctuation in income through promotion of “The TOP 2021,” enhance the value of the Group, and establish a stable foundation which will continuously support the Group’s growth far into the future.

The Group recorded consolidated net sales of ¥906,454 million in 2019, down 8.6% from the previous year. The sales in the Chemicals segment slightly increased. However, the sales in the other 5 segments decreased. The sales in the Inorganics segment decreased due to a decrease in sales volumes of graphite electrodes resulting from reduction of output. The sales in the Petrochemicals segment decreased due to declining market prices of petrochemical products.

Operating income of the Group in 2019 decreased by 32.9%, to ¥120,798 million. Operating income in the Others segment increased. However, operating income in the other 5 segments decreased. In the Inorganics segment, operating income decreased due to a decrease in production volumes of graphite electrodes. In the Electronics segment, operating income decreased due to a decline in shipment volumes of HD media for use in PCs. As a result, the Group recorded ordinary income of ¥119,293 million, down 33.3% from the previous year.

The Group recorded operating income attributable to owners of the parent of ¥73,088 million in 2019, down 34.5% from the previous year.

(Unit: millions of yen)

	2018 Jan.-Dec.	2019 Jan.-Dec.	Increase/decrease
Sales	992,136	906,454	-85,682
Operating income	180,003	120,798	-59,205
Ordinary income	178,804	119,293	-59,511
Net income attributable to owners of the parent	111,503	73,088	-38,415

(2) A breakdown of net sales and operating income by segment (January 1 - December 31, 2019)

[Petrochemicals segment]
In the Petrochemicals segment, net sales decreased 6.8%, to ¥250,678 million. In our olefin business, sales volumes of ethylene and propylene increased from the previous year because there was no once-in-four-year large-scale shutdown maintenance of ethylene production facilities which took place in the first half of 2018. However, sales of olefin products decreased due to a fall in market prices of petrochemical products in Asia resulting from easing supply-demand situation. Sales of organic chemicals decreased due partly to a decline in market prices of vinyl acetate and ethyl acetate. Operating income of the segment decreased 15.4%, to ¥17,201 million.

(Unit: millions of yen)

	2018 Jan.-Dec.	2019 Jan.-Dec.	Increase/decrease
Sales	268,879	250,678	-18,201
Operating income	20,333	17,201	-3,132

[Chemicals segment]
In the Chemicals segment, sales increased 0.6%, to ¥157,480 million. In the basic chemicals business sales slightly decreased. Production of liquefied ammonia and chloroprene rubber maintained at the same level of the previous year. However, sales of acrylonitrile decreased due to a fall in the market price. Shipment volumes and sales of electronic chemicals decreased due to adjustment of production in the semiconductor and display industries. Sales of industrial gases and functional chemicals were at the same levels of the previous year. In addition, non-stick coating chemicals companies which we acquired in recent years were newly consolidated. As a result, sales in the Chemicals segment increased. However, operating income of the segment decreased 21.5%, to ¥13,656 million.

(Unit: millions of yen)

	2018 Jan.-Dec.	2019 Jan.-Dec.	Increase/decrease
Sales	156,541	157,480	939
Operating income	17,393	13,656	-3,737

[Electronics segment]
In the Electronics segment, sales decreased 13.8%, to ¥96,445 million. Sales of HD media deceased due partly to the bearish shipment volumes of media for PCs. In addition, in the first half of 2019, shipment volumes of HD media for use in data centers decreased due to a global slowdown in investment in the field of information technology (IT). Sales of rare

earth magnetic alloys decreased due to structural reforms. Sales of compound semiconductors decreased due to a decrease in shipment volumes. Sales of lithium-ion battery (LIB) materials decreased due to a decrease in shipment volumes resulting partly from a stagnant EV market in China. As for SiC epitaxial wafer business, sales decreased due mainly to a decrease in export, despite an increase in sales volumes of products for use in electric railcars. Operating income of the segment decreased 64.0%, to ¥4,880 million.

(Unit: millions of yen)

	2018 Jan.-Dec.	2019 Jan.-Dec.	Increase/decrease
Sales	111,912	96,445	-15,467
Operating income	13,557	4,880	-8,677

SiC epitaxial wafer business was transferred from the Others segment to the Electronics segment at the beginning of 2019. Data in the table above are based on this new segmentation retrospective to 2018.

[Inorganics segment]
In the Inorganics segment, sales decreased 13.5%, to ¥230,135 million. Sales of graphite electrodes decreased due to a reduction in the Company's production and sales volumes of graphite electrodes starting from the middle of 2019 aiming to respond to the weakening supply-demand situation of graphite electrodes mainly in the European market resulting from a slowdown in steel production and partial-clearance of our customers' graphite-electrode inventory. Sales of ceramics decreased due to a fall in shipment volumes of fine ceramics for electronics resulting from adjustment of production in the electronic parts/materials industry, in addition to a reduction in shipment volumes of general purpose alumina and abrasives. The segment recorded operating income of ¥89,256 million, down 32.6% from the previous year.

(Unit: millions of yen)

	2018 Jan.-Dec.	2019 Jan.-Dec.	Increase/decrease
Sales	266,149	230,135	-36,014
Operating income	132,445	89,256	-43,189

[Aluminum segment]
In the Aluminum segment, sales decreased 9.9%, to ¥97,542 million. Sales of rolled products decreased due to a decline in shipment volumes of high-purity aluminum foil for capacitors resulting from adjustment of production in customer industries including industrial equipment and automotive parts industries. Sales of aluminum specialty components decreased due mainly to a decline in shipment volumes of those for use in automotive parts. Sales of aluminum cans remained at the same level of the previous year. Operating income of the segment decreased 64.7%, to ¥1,746 million.

(Unit: millions of yen)

	2018 Jan.-Dec.	2019 Jan.-Dec.	Increase/decrease
Sales	108,254	97,542	-10,712
Operating income	4,942	1,746	-3,195

[Others segment]
In the Others segment, sales decreased 8.1%, to ¥126,163 million. SHOKO CO., LTD.'s sales decreased due to falling markets for Plastics Division and Metal Ceramics Division. However, operating income of the segment increased 4.9%, to ¥1,819 million.

(Unit: millions of yen)

	2018 Jan.-Dec.	2019 Jan.-Dec.	Increase/decrease
Sales	137,324	126,163	-11,161
Operating income	1,734	1,819	85

SiC epitaxial wafer business was transferred from the Others segment to the Electronics segment at the beginning of 2019. Data in the table above are based on this new segmentation retrospective to 2018.

(3) Major steps taken or decided in 2019

[General]

- Planned commencement of tender offer for shares in Hitachi Chemical Company, Ltd.

For detail, please refer to our news releases and their notes announced on December 18, 2019.

- Acquired ILAG Group, global non-stick coatings manufacturer

In July 2019, SDK acquired all shares in Industrielack AG (ILAG), which leads the ILAG Group, a specialty non-stick coating materials manufacturing company. Non-stick coating materials (NSCs) are used on consumer goods such as cookware, bakeware, and home electrical appliances, and also on industrial goods including automotive parts and other industrial equipment, for the purposes of preventing sticking of substances on their surfaces and supporting low friction and release during use. The global market for NSCs is put about ¥130 billion (about $1.2 billion) a year (SDK's estimate as of May 2019). ILAG has the fourth largest share in the consumer-goods NSC market of worldwide operating companies. ILAG exports its products to more than 50 countries. On the other hand, SDK already acquired GMM Group, another large manufacturer of NSCs for consumer goods, in November 2016. Therefore, SDK Group can pursue a synergy effect of integrated operation and marketing between ILAG and GMM groups because they have competitive market shares in different geographic areas in the world. In addition, after the acquisition of ILAG, annual sales figure of SDK's NSC business leaped up to about $60 million, and now has strong presence and competitiveness in global market, especially in the field of consumer goods. SDK's functional polymer/monomer business sector manufactures and sells materials for coatings for various purposes, and have rich expertise in prescription and manufacturing of raw materials for high-performance coatings and evaluation of performance of those coatings. NSCs can be classified into three categories in terms of raw materials, namely, fluorinated-resin based, silicon based, and Sol-Gel based coatings. Therefore, SDK can offer optimum solutions to its own NSC business by taking advantage of its wide-ranging businesses, products and technologies as an integrated chemical company.

- Revised CSR policy

In May 2019, the Showa Denko Group revised its CSR policy in order to clearly show our stakeholders that we aim to contribute to creating sustainable society from the medium- to long-term perspective. Our new CSR policy determines that "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." Under this new CSR Policy, the Group will continue striving to create economic and social value based on safety and compliance. In addition, SDK endorsed the aim of the opinion offered by Financial Stability Board* (FSB) to establish Task Force on Climate-related Financial Disclosures (TCFD). We will disclose the effect of climate change on our business in a positive manner, following guidelines which is to be offered by TCFD in the near future.

*Financial Stability Board was established in 2009, and copes with fragility of international financial system and promotes dialogue among authorities responsible for stability of financial system.

- Set 2030 GHG reduction target conforming to global standard

In July 2019, SDK set a medium-term target figure to reduce emissions of greenhouse gases (GHGs) by 2030. In addition, recognizing importance of information disclosure to the global community, SDK has decided to announce the amount of the Showa Denko Group's GHG emissions in conformity with "GHG Protocol," which is the global standard, starting from the data for FY 2018 (April 2018 - March 2019). Based on these policies, the Showa Denko Group set a goal of 11% reduction of GHG emissions from its domestic bases for FY 2030 compared with that for FY 2013. In addition, with the announcement of data for FY2018 as its beginning, the Showa Denko Group has started to disclose the total amount of GHG emissions from bases at home and abroad in accordance with GHG Protocol, namely, the amount of direct GHG emissions from the Group's own facilities (Scope 1), the amount of indirect GHG emissions from purchased or acquired electricity, steam and heat (Scope 2), and the amount of indirect GHG emissions from the corporate value chain (Scope 3). The Group will announce these data through its integrated report (Showa Denko Report), its Website explaining the Group's CSR activities, and other media. Moreover, aiming to set the Group's global warming mitigation measures as a part of its business strategy, the Group will introduce Internal Carbon Pricing* mechanism and incorporate reduction of GHG emissions into the decision-making process for investment as a factor to be considered. The Showa Denko Group will continue introducing environment-conscious production equipment and technologies, promoting environment protection measures, and providing products that support recycling-oriented society, thereby contributing to creation of society where affluence and sustainability are harmonized.

*Internal Carbon Pricing: This mechanism assumes a situation in which emission of CO_2 is taxed, makes target organizations recognize the value of low-carbon operation, and motivates them to choose investment programs with less CO_2 emission.

- Established a technology to joint aluminum alloy and polycarbonate directly

SDK developed a technology to joint aluminum alloy and polycarbonate resin directly. Mechanical joining with bolts and nuts and gluing is widely used to joint metal and plastics. Technologies to joint metal and resins directly when resin materials are injected for molding are now attracting manufacturers' attention because such technologies enable manufacturers to simplify manufacturing processes, improve productivity, and process parts with complicated shapes. It has been believed difficult to joint aluminum alloy with amorphous engineering plastics including polycarbonate resin by utilizing joining technologies depending on mechanical cohesiveness including anchoring. However, SDK has successfully developed a technology to joint aluminum alloy and polycarbonate resin directly by utilizing our special surface-treatment technology and expertise in primers. This new technology is characterized with joining mechanism utilizing not only anchoring effect but also chemical cohesiveness. In addition, in experiments, this technology successfully achieved cohesiveness of more than 25MPa between aluminum alloy and polycarbonate under normal molding condition for polycarbonate resin. Since this technology realizes direct joining between polycarbonate resin, which has wide multiplicity of use, and light aluminum alloy, it is applicable to molding of composite housings for smartphones and other equipment. For the future, we will aim to strengthen cohesiveness and durability of this joining, apply this technology to heat-resistant super-engineering plastics, and put automotive parts made with this technology to practical use.

- Introduced SAP S4/HANA as next-generation ERP system

In May 2019, SDK introduced "SAP S/4HANA," an enterprise resource planning (ERP)

system developed by SAP SE, and started operation of the new system in January 2020. The new ERP system will gather and accumulate various primary information about production, logistics, sale, accounting and procurement, and will realize integrated management of that information. In addition, SDK will strengthen its marketing function with additional new system, aiming to maximize customer experience. SDK will utilize SAP S/4HANA for issuing sophisticated sales forecast and simulating profit and loss so that the Company can make proper decisions quickly. In addition, SDK will introduce a marketing support system which will enable the Company to implement cross-sectional CRM* and generate new business opportunities. The total investment in our information infrastructure of this time will amount to about 4 billion yen. The Showa Denko Group holds up "Maximization of CUSTOMER Experience" as its business strategy, and promotes utilization of AI/IoT related technologies as measures to strengthen the Group's business foundation. SDK will analyze information accumulated in the new system with AI and other leading-edge technologies, realize more efficient management of the Group and offer excellent solutions as combination of high-quality products and services.

*CRM is an abbreviation of "customer relationship management," which is a management method to provide customers with more satisfactory products and services by accumulating and analyzing data concerning customers' purchasing behavior and history.

- Contracted with Oita Trinita to be a uniform sponsor

In December 2019, SDK signed a contract with Oita Football Club Co., Ltd. (Oita Trinita), a member of J. League, to be a uniform sponsor to have SDK's corporate logo on the right clavicular position of the uniform of Oita Trinita. Term of the contract is one year, from February 1, 2020 to January 31, 2021. Showa Denko Group's business bases has been promoting various programs to activate dialogue with regional communities. Oita Petrochemical Complex has been organizing various programs, aiming to maintain harmonious relationship with the regional community for 50 years since the start of operation of its ethylene plant in 1969. Oita Trinita also has been contributing to revitalization of the regional community and promotion of sports as a community-based football club. SDK believes that its support to Oita Trinita as a uniform sponsor, in addition to its support to the regional community as the holder of naming rights of Oita Trinita's home stadium (Showa Denko Stadium Oita), will contribute to further promotion of CSR activities, and therefore decided to support Oita Trinita as a uniform sponsor,. The Showa Denko Group will continue promoting various programs, aiming to fulfill its CSR and make itself "a company contributing to sound growth of society" that satisfies all stakeholders.

[Petrochemicals segment]

- Decided to commercialize 1,3-BG, a raw material for cosmetics

In October 2019, SDK decided to commercialize 1,3-butylene glycol (1,3-BG), which is mainly used as raw material for cosmetics. SDK has finished installation of facilities to produce 1,3-BG in its Oita Complex, and plans to start sale of the product in April 2020. 1,3-BG is mixed into many kinds of cosmetics as moisturizing component. Due to rapid growth in Asian demand for cosmetics, the demand for 1,3-BG is expected to increase 10% every year*. SDK will realize production of 1,3-BG with quality good enough to be used as an ingredient of cosmetics by utilizing its original technology, and support the growth of cosmetics market centering on Asia from supply side of raw materials including 1,3-BG. SDK will continue striving to make its petrochemicals business the most competitive one in East Asia by enhancing its profitability through commercialization of new derivatives and improvement in mutual cooperation among members of the regional complex, including strengthening of its acetyl chain.

*SDK's estimate

[Chemicals segment]

- Decided to establish second factory in Shanghai to produce electronic high-purity gases

In January 2020, SDK decided to establish its subsidiary's second factory in Shanghai to produce high-purity gases for electronics. Shanghai Showa Electronics Materials Co., Ltd. (SSE), which is SDK's wholly owned subsidiary producing high-purity gases for electronics, acquired a right to use a site for its second factory adjacent to the First Factory for 50 years, and will establish facilities to produce high-purity nitrous oxide (N_2O) and high-purity octafluorocyclobutane (C_4F_8) gases and a dangerous goods warehouse to stock high-pressure gases. The second factory will start its operations in the second half of 2021. High-purity N_2O is a specialty gas used to form oxidized films on surfaces of integrated circuits which will compose semiconductor chips or display panels. High-purity C_4F_8 is a specialty gas used for etching of those oxidized films and other micromachining processes. The Showa Denko Group is now producing high-purity N_2O at Kawasaki Plant and a site of a group company in the Republic of Korea, and high-purity C_4F_8 at Kawasaki Plant and SSE's First Factory in Shanghai. Due to progress in information communication technologies including 5G mobile communication technology and Chinese government's policy to nurture high-technology industry, the market in China for semiconductor chips and display panels. In order to strengthen its adaptability to changes in needs of the market, including the need for stable supply of high-purity gases, the Group now aims to promote "local consumption of locally produced high-purity gases" further. Moreover, in the present situation where the Chinese government is strengthening regulations on chemicals, establishment and expansion of the Showa Denko Group's dangerous goods warehouse in China to stock high-pressure gases will enable the Group to strengthen its supply chain and competitiveness. By combining its production and quality-control technologies and getting best supply system ready for customers, the Showa Denko Group will further strengthen its high-purity gas business. In addition, since the market for semiconductor chips in Taiwan is also expected to expand, SDK's subsidiary "Taiwan Showa Chemicals Manufacturing Co., Ltd." will establish a new facility to produce high-purity C_4F_8 with annual production capacity of 150t. The start-up of operations of the new facility in Taiwan is scheduled to be in the spring of 2020.

- Started shipments of BMC for TOYOTA's hybrid vehicles in China

SDK started supplying bulk molding compound (BMC) to Toyota Motor Corporation (TOYOTA) as sealing material for generator motors used in COROLLA HYBRID and LEVIN HYBRID recently launched in China. SDK's BMC has such characteristics as high heat conductivity, insulation properties, heat resistance, fluidity, dimensional stability and chemical resistance. The material has been used as sealing material for generator motors for hybrid vehicles (HVs), such as TOYOTA's PRIUS. This time, TOYOTA decided to develop and produce electric-vehicle power trains in China on the occasion of the introduction of two new HV models for the Chinese market. In response to this new policy, Shanghai Showa Highpolymer started producing BMC for HVs for the first time since its foundation in 2010, and supplying the material to Toyota Motor (Changshu) Auto Parts. The Chinese government introduced this year a new environmental regulation, obliging car makers to produce a certain number of new energy vehicles (NEVs). There is a move to spread the use of HVs as fuel-efficient cars for environmental protection. Thus, the HV market in China is expected to grow further.

- Started mass production of liquefied carbon dioxide in Oita Petrochemical Complex

Showa Denko Gas Products Co., Ltd. (SGP), a consolidated subsidiary of SDK, established a new plant to produce liquefied carbon dioxide in its Oita Plant in the premise of SDK's Oita Petrochemical Complex. This new plant has a capacity to produce 15,000t of liquefied carbon dioxide per year, and started to ship products in April 2019. A tight

supply-demand situation for liquefied carbon dioxide is chronic due to scaling back of domestic oil-refining and ammonia production which has been supplying carbon dioxide as by products. This new plant utilizes carbon dioxide gas stably supplied from chemical plant in the Complex, and will continue supplying products to customers in the region in a stable manner, thereby contributing to the growth of the regional economy.

[Electronics segment]

- Developed second generation of high-grade SiC epitaxial wafers

SDK has developed a second generation of high-grade silicon carbide (SiC) epitaxial wafers (HGE-2G) for power semiconductors. SDK has been mass-producing the first generation of high-grade epitaxial wafers under the trade name of "High-Grade Epi" (HGE). HGE-2G achieved further improvement in quality. When compared with the currently mainstream silicon-based semiconductors, SiC-based power semiconductors can operate under high-temperature, high-voltage, and high-current conditions while substantially reducing energy loss. These features enable device manufacturers to produce smaller, lighter and more energy-efficient power control modules, and the products' market is rapidly expanding. SiC power semiconductors are already used in power modules for servers in data centers, on-board battery chargers and rapid charging stands for EVs. In addition, SiC power semiconductors are expected to be used in power control units (PCU) for EVs in the first half of 2020s. Thus the demand for SiC-based semiconductors is expected to grow further. In the new product "HGE-2G," SDK has succeeded in controlling the density of surface defect, which affects production yield of power semiconductors, to be half of our HGE by improving epitaxial SiC growth process. In addition, SDK has succeeded in enhancing reliability of power semiconductors through improving the basal plane dislocation conversion rate by more than ten times compared with that of HGE. The global demand for SiC epitaxial wafers is expected to increase to be about ¥150 billion by 2025. As the largest independent manufacturer of SiC epitaxial wafers, and under a motto of "Best in Class," SDK will continue coping with rapid expansion of the market for SiC epitaxial wafers, developing reliable products, and investing positively to expand its production capacity, thereby making its SiC epitaxial wafer business a *Koseiha* business.

- Began shipment of MAMR-technology-based HD media

In 2019, SDK began shipment of newly developed 3.5-inch HD media which have storage capacity of 2 terabyte per disk based on the Microwave Assisted Magnetic Recording (MAMR)*1 technology for next-generation hard disk drives (HDDs). This product, which SDK developed with its new technology, has been adopted by Toshiba Electronic Devices & Storage Corporation for use in MAMR-technology-based 18 terabyte near-line HDD, which represents the largest storage capacity*2 in the industry. Due to the rapid expansion of cloud service and video content, data centers need HDDs with larger storage capacity. HD media are key parts for HDDs to determine their storage capacities, and SDK has been quickly launching top-quality media based on innovative technologies. As the largest independent HD media supplier, SDK will continue contributing to the increase in storage capacities of HDDs in accordance with its motto of "Best in Class."

*1: MAMR is an abbreviation of Microwave Assisted Magnetic Recording, which is a technology to assist high-density recording of data into HD media by radiating microwave on magnetic layer of the disk to reduce coercive force only when data is written into there.

*2: As of February 11, 2019.

[Inorganics segment]

- Decided to improve Carbon Division's production sites in Europe

In May 2019, SDK decided to improve facilities to produce graphite electrodes at its production sites in Europe in order to establish a global system for supplying products with

the same high quality. These sites are controlled by SDK's consolidated subsidiary SHOWA DENKO CARBON Holding GmbH, The construction work and quality improvement efforts are scheduled to begin in 2019 for completion in 2020 and the amount of investment will be about ¥5 billion. In its graphite electrode business, SDK is operating production sites in the USA, Europe, Japan, China and East Asia, with the largest share in the world's production capacity of high-quality graphite electrodes. SDK aims to achieve the synergy effect of business integration (BIS40 Note) while ensuring stable supply and optimizing supply cost at respective graphite electrode production sites. SDK will continue taking various measures to achieve "Value in Use No. 1" for customers and to increase the competitiveness and profitability of its graphite electrode business.

Note: "BIS40" refers to SDK's medium-term plan for maximizing the synergy of integrating graphite electrode business of SDK and its U.S. subsidiary Showa Denko Carbon, Inc. with that of former SGL GE Holding GmbH (acquired in 2017). Specifically, SDK aims to optimize its global supply and distribution channels, increase its bargaining power in raw material procurement, and combine respective advantages; namely, high productivity and cost-competitiveness of former SGL sites with high product quality at SDK's Omachi Plant and Showa Denko Carbon, Inc. Through these measures, SDK aims to achieve "Value in Use No. 1" for customers, and produce an economic effect of ¥4 billion by 2020.

[Aluminum segment]

- Decided to establish third aluminum can production base in Vietnam and streamline domestic aluminum can production lines

In April 2019, Showa Aluminum Can Corporation (SAC), a consolidated subsidiary of SDK, decided to establish its third base in Vietnam to produce aluminum cans, aiming to expand its business in that country. This new production base is to be located in Ba Ria-Vung Tau Province, which is in the southern part of Vietnam. In addition, SAC also decided to expand the capacity of can end production lines in the existing factory located in the northern part of Vietnam. Hanacans Joint Stock Company (Hanacans), an affiliated company of SAC incorporated in Vietnam, has lines to produce can bodies and can ends in its Bac Ninh Factory located in the northern part of Vietnam, and lines to produce can bodies in its Quang Nam Factory located in the central part of Vietnam. Hanacans will establish a new factory, which is to have capacity to produce 1.3 billion can bodies per year, in the suburbs of Ho Chi Minh City in the southern part of Vietnam, and install an additional line to produce can ends with production capacity of 1.1 billion can ends per year in Hanacans' Bac Ninh Factory. As a result of these measures, Hanacans will have three factories to cover everywhere in Vietnam, and have capacities to produce 3.1 billion can bodies and 3.3 billion can ends per year in total. The total amount of investment in the construction of the new factory and additional can-end production line is expected to be about ¥7 billion. The new facilities are scheduled to start production in July 2020. As for SAC's domestic aluminum can business which is now operating three production bases in Japan, SAC decided in May 2019 to stop a part of its production lines to manufacture aluminum cans in its two plants, Oyama Plant and Hikone Plant, and streamline the company's domestic production capacity to be about 60% of the current level by June 2020, in order to respond to changes in the domestic market environment. In its domestic aluminum ca business, SAC will promote introduction of formulas linked to aluminum-metal prices to calculate and determine sales prices of aluminum cans, aiming to stabilize its revenue base.

(4) Projections for 2020

a) Overall performance forecast

In 2020, the Japanese economy is expected to continue gradual recovery. Consumer spending is expected to show a steady change due to good employment environment. However, corporate earnings are expected to be stagnated due to slowdown in Chinese

economy. Overseas economies are expected to show slight recovery due to the effect of monetary relaxation. As for the European economy, major countries will show weak recovery while overall economic condition is expected to remain hard. The Chinese economy is expected to slow down mainly in the manufacturing industry due to trade friction between China and the U.S. In ASEAN countries, economies are expected to show bearish tendencies. The semiconductor industry is expected to recover. However, the automotive industry is expected to remain sluggish worldwide.

There will be downward risk factors for the Japanese and global economies such as the effect of US administration's policies on international trade including that of trade friction between China and the U.S., the situation in the Middle East, and the possible wide fluctuations in exchange rates and market prices of natural resources. In addition, the risk of the spread of new-type coronavirus causing pneumonia is now increasing, and may have a great influence on world economy. Thus the business environment will remain severe.

Under these circumstances, the Showa Denko Group will promote management to maximize shareholders', customers' and social value on the basis of its business philosophy. The Group will strengthen its earning power and reduce the range of fluctuation in income through promotion of "The TOP 2021," enhance the value of the Group, and establish a stable foundation which will continuously support the Group's growth far into the future.

The Group's performance forecast for 2020 is as follows.

(Unit: millions of yen)

	Results for the term ended Dec. 31, 2019	Forecast for the term ending Dec.31, 2020	Increase/ decrease	Rate of change (%)
Net sales	906,454	810,000	-96,454	-10.6
Operating income	120,798	50,000	-70,798	-58.6
Ordinary income	119,293	47,000	-72,293	-60.6
Net income attributable to owners of the parent	73,088	15,000	-58,088	-79.5

The above forecast is based on the assumption that the exchange rates and the naphtha price will be ¥105.0/$, ¥115.0/€ and ¥39,200/KL for 2020, respectively.

b) Net sales and operating income by business segment

[Net sales]

(Unit: millions of yen)

	Results for the term ended Dec. 31, 2019	Forecast for the term ending Dec. 31, 2020	Increase/ decrease
Petrochemicals	250,678	233,000	-17,678
Chemicals	157,480	170,000	12,520
Electronics	96,445	112,000	15,555
Inorganics	230,135	128,000	-102,135
Aluminum	97,542	96,000	-1,542
Others	126,163	125,000	-1,163
Adjustments	-51,989	-54,000	-2,011
Total	906,454	810,000	-96,454

[Operating income]

(Unit: millions of yen)

	Results for the term ended Dec. 31, 2019	Forecast for the term ending Dec. 31, 2020	Increase/ decrease
Petrochemicals	17,201	12,000	-5,201
Chemicals	13,656	15,000	1,344
Electronics	4,880	12,000	7,120
Inorganics	89,256	14,000	-75,256
Aluminum	1,746	4,000	2,254
Others	1,819	2,500	681
Adjustments	-7,759	-9,500	-1,741
Total	120,798	50,000	-70,798

The above forecast is based on the information available as of February 13, 2020 and our assumptions as of the same date about risk factors that could affect our future performance. Actual results may differ materially due to a variety of reasons.

2. Financial conditions for the January 1 – December 31, 2019 period

(1) Assets, liabilities and net assets

Total assets at the end of the year amounted to ¥1,076,381 million, an increase of ¥1,398 million from the level at December 31, 2018. Total assets increased due mainly to the increase in inventories, despite a decrease in accounts receivable-trade. Total liabilities decreased ¥52,695 million, to ¥556,949 million, due partly to the decrease in accounts payable-trade, despite an increase in interest bearing debt. Interest bearing debt increased ¥10,556 million, to ¥298,524 million. Net assets at the end of the year amounted to ¥519,433 million, up ¥54,093 million, due mainly to the posting of net income attributable to owners of the parent.

(2) Cash flows in 2019

Net cash provided by operating activities decreased ¥71,231 million from the previous year, to ¥78,554 million, due partly to the decrease in income before income taxes and minority interests. Net cash used in investing activities decreased ¥1,182 million, to ¥48,156 million, due partly to an increase in proceeds from sales of investment securities.

Thus, free cash flow ended up in the proceeds of ¥30,397 million, a decrease in proceeds of ¥70,050 million. Net cash used in financing activities decreased ¥42,516 million due partly to a decrease in repayments of interest bearing debts, and ended up in the payment of ¥18,546 million. As a result, and due partly to the influence of exchange rate fluctuations, cash and cash equivalents at December 31, 2019 increased ¥8,899 million from the end of the previous year, to ¥121,734 million.

(3) Cash flow projections for 2020

Cash flows from operating activities will decrease. As for net cash used in investing activities, payment will increase from that in 2019. Thus, free cash flow in 2020 is expected to decrease by around ¥25,000 million from ¥30,397 million in 2019, to the proceeds of ¥5,000 million. Interest bearing debt at the end of the year will be ¥300,000 million, up around ¥1,500 million.

(4) Trends in cash flow indexes

	2016	2017	2018	2019
Equity ratio	31.8%	34.3%	41.5%	46.4%
Equity ratio on a market value basis	25.6%	66.8%	44.3%	39.3%
Debt maturity (years)	5.2	5.2	1.9	3.8
Interest coverage ratio	21.4	23.8	35.1	33.8

[Notes]
Equity ratio: Equity / Total assets
Equity ratio on a market value basis: Total market value of listed shares / Total assets
Debt maturity (years): Interest-bearing debt / Cash flows from operating activities
Interest coverage ratio: Cash flows from operating activities / Interest payment

- Each index is calculated by relevant formulas with financial figures quoted from the consolidated financial statements.
- Equity is calculated by deducting minority interests from total net assets.
- Total market value of listed shares is calculated by multiplying the closing share price at the year-end by the number of shares issued, after deducting treasury stock.
- As to the cash flows, the amount of “cash flows from operating activities” in the consolidated cash flow statement is used.
- “Interest-bearing debt” refers to loans payable, commercial paper, and bonds as listed among liabilities on the consolidated balance sheet.
- As to the interest payment, the amount of “interest expense” in the consolidated cash flow statement is used.

3. Management Policy

(1) Medium to long-term business strategy

1) Medium-term business plan “The TOP 2021” (announced in December 2018)

Since 2019, the Showa Denko Group has been promoting medium-term consolidated business plan “The TOP 2021.” Under this business plan, the Group is changing its course toward long-term business growth, thereby establishing a stable foundation which will continuously support the Group’s growth far into the future.

It is very important for the Showa Denko Group to continue constructive communication with all stakeholders including shareholders, customers, suppliers, local communities, and employees, aiming to satisfy them and enhance the value of the Group in order that the Group continuously grows and is trusted and acclaimed by society. The Showa Denko Group defines this idea as the Group’s business philosophy, thereby promoting management to maximize shareholders’, customers’ and social value.

2) Basic strategy under “The TOP 2021”

The Group defined its Mission, Vision and Value as follows, aiming to realize the Group’s business philosophy.

Mission (The meaning of our existence): We will satisfy all stakeholders.

Vision (Our goal):	KOSEIHA Company KOSEIHA Company is an aggregate of KOSEIHA Businesses. KOSEIHA Business is a business in which SDK has a top market share in the market of appropriate size (Operating margin of 10% or more; Operating income of billions of yen or more; Stable profitability tolerant to environmental change)
Value (Means to realize Vision):	Maximization of CUSTOMER Experience (Maximization of the value that our customer experiences)

The Group redefined its business portfolio in accordance with each business’s battlefield, financial goal and course of action.

a) Drastic improvement in existing businesses (Enhance / Grow / Change)

Enhance: Businesses categorized into this are positioned as businesses that should continuously improve profitability. These businesses compete in mature markets and enhance offering value by evolving business models. We will aim to make petrochemicals, industrial gases and basic chemicals businesses No.1 in specific regions/fields. As for HD media and graphite electrode businesses, we will aim to make these businesses global No.1 by taking advantage of our superiority in technology and quality and deepening customer relations at home and abroad.

Grow: Businesses categorized into this are positioned as businesses that should realize high growth rate and high profitability simultaneously. We will accelerate growth of these businesses in growing market at home and abroad.
We will aim to make our electronic chemicals business global No.1 in terms of market share, growth rate and profitability. We will also aim to make our advanced battery materials, electronics materials and SiC epitaxial wafer for power devices businesses establish leading presence in target markets (i.e., establish bases for rapid growth and high

profitability).

Change: Businesses categorized into this are positioned as businesses that should increase sales while maintaining profitability. We will change business models of them, considering expansion into downstream.
We will aim to make our aluminum can and aluminum rolled products businesses expand overseas business activities. We will also aim to make our aluminum specialty components, functional chemicals, and ceramics businesses shift to solution oriented businesses, and change them to high-value adding businesses.

b) Creation of new businesses (**Create**)
Aiming to create new businesses, the Group will take strategic discontinuous measures such as M&As in addition to R&D to realize organic growth of the Group.

c) Inter-business cooperation
The Group has wide-ranging-businesses and materials-related-technologies concerning inorganics, organics, aluminum, etc. The Group also has elemental technologies concerning process design, process analysis, evaluation, etc. We will aim to offer new added-value and solutions in growing markets through combination of these existing businesses and technologies. As the first case of such inter-business cooperation, we started a project to create new composite materials for cars in January 2019. This new project will offer solutions such as composite materials to optimize light weight/rigidity, heat radiation/heat storage, electrical insulation and adhesion between different materials, adapted to future changes in automotive industry which will change the industry's requirements for materials.

d) Strengthening base of strategy
To conduct business activities globally and realize continuous business growth, the Showa Denko Group must fulfill corporate social responsibility and promote integrated Group management with awareness of future changes in market environment and technologies, in order to contribute to solution of social issues known as Sustainable Development Goals (SDGs). Therefore, the Group will promote various measures which will also be incorporated into the next medium-term consolidated business plan, including strengthening of R&D functions and marketing functions, and introduction of AI/IoT.

(2) Performance targets
Under the medium-term consolidated business plan "The TOP 2021," the Group set its performance targets as follows.

(Unit: Billion yen)

	2019 – 2021 targets (3-year total)	2019 actual results
Net sales	3,400	906.5
Operating income	480	120.8
Operating margin	14.1%	13.3%
Net income attributable to owners of the parent	330	73.1
ROA	12.6%	11.2%
ROE	19.5%	15.5%

Note 1: ROA is based on operating income, and the simple average of each term.
Note 2: ROE is the simple average of each term.

(3) Financial strategy

1) Basic strategy

To realize continuous growth of the Group, we set clear criteria for capital investment based on capital costs, and carefully select investments, while maintaining positive stance on capital investment. We will also implement discontinuous investment including M&A. We will improve business efficiency through productivity improvement and use of Cash Conversion Cycle (CCC) as management tool. Aiming to improve return to shareholders, the Group will make its best effort to realize total return ratio of 30% by 2021. The Group will not only strive to continue high dividends but also consider buying treasury stock in timely and continuous manner.

2) Financial targets

We set specific targets for D/E ratio, total return ratio and total investment, and will strive to achieve them. We will aim to keep our rating of A or higher and upgrade it.

	Targets	2019 results
D/E ratio	About 0.5 times (as of December 31, 2021)	0.6 times
Total return ratio	About 30% (in 2021)	25.9%
Total investment	¥400 billion (2019 – 2021 total)	¥54 billion

Note: Total investment is the total of capital investment (investment in facility improvement = ¥120 billion, investment in organic growth = ¥130 billion), and investment in M&A = ¥150 billion

Our rating at the time we announced the medium-term business plan was A^{-}, which was upgraded to A in 2019.

4. Our view on selection of accounting standard

The Showa Denko Group intends to execute its consolidated financial statements in accordance with Japanese standards for the moment, after careful consideration to comparability among consolidated financial statements of different terms or different companies. As for application of International Financial Reporting Standards (IFRS), we will continue carefully observing circumstances in and outside Japan and deal with the standards appropriately.

Consolidated Balance Sheets

(¥ in millions, US$ in thousands)

	Dec. 31, 2018	Dec. 31, 2019	Dec. 31, 2019
Assets	¥	¥	$
Current assets			
Cash and deposits	113,186	122,086	1,114,332
Notes and accounts receivable-trade	203,730	170,293	1,554,334
Merchandise and finished goods	65,882	70,140	640,200
Work in process	26,160	30,979	282,757
Raw materials and supplies	60,758	72,548	662,178
Other	28,202	31,765	289,929
Allowance for doubtful accounts	(1,386)	(754)	(6,885)
Total current assets	496,533	497,057	4,536,845
Noncurrent assets			
Property, plant and equipment			
Buildings and structures, net	78,777	79,781	728,197
Machinery, equipment and vehicles, net	146,764	140,681	1,284,056
Tools, furniture and fixtures, net	6,773	7,550	68,914
Land	234,987	226,362	2,066,098
Construction in progress	11,106	18,794	171,543
Total property, plant and equipment	478,406	473,168	4,318,807
Intangible assets			
Other	14,950	22,650	206,734
Total intangible assets	14,950	22,650	206,734
Investments and other assets			
Investment securities	71,886	71,786	655,220
Net defined benefit asset	249	244	2,227
Deferred tax assets	4,574	3,381	30,857
Other	16,717	16,221	148,059
Allowance for doubtful accounts	(8,332)	(8,125)	(74,164)
Total investments and other assets	85,094	83,506	762,198
Total noncurrent assets	578,450	579,325	5,287,739
Total assets	1,074,983	1,076,381	9,824,584
Liabilities			
Current liabilities			
Notes and accounts payable-trade	139,420	117,510	1,072,563
Short-term loans payable	61,747	52,720	481,194
Current portion of long-term loans payable	41,403	31,943	291,560
Commercial papers	20,000	—	—
Provision for repairs	64	644	5,874
Provision for bonuses	3,516	3,050	27,834
Provision for stock payment	5	—	—
Provision for business structure improvement	129	1,686	15,389
Other	95,791	55,323	504,955
Total current liabilities	362,074	262,875	2,399,368
Noncurrent liabilities			
Bonds payable	42,000	62,000	565,900
Long-term loans payable	122,818	151,861	1,386,096
Deferred tax liabilities	6,027	7,950	72,563
Deferred tax liabilities for land revaluation	32,324	32,150	293,449
Provision for repairs	1,102	2,021	18,448
Provision for stock payment	156	200	1,823
Provision for business structure improvement	2,876	824	7,521
Net defined benefit liability	22,018	9,969	90,990
Other	18,248	27,099	247,345
Total noncurrent liabilities	247,569	294,074	2,684,135
Total liabilities	609,643	556,949	5,083,502
Net assets			
Shareholders' equity			
Capital stock	140,564	140,564	1,282,982
Capital surplus	78,911	78,912	720,263
Retained earnings	197,717	249,246	2,274,973
Treasury stock	(11,659)	(11,664)	(106,465)
Total shareholders' equity	405,532	457,057	4,171,753
Accumulated other comprehensive income			
Valuation difference on available-for-sale securities	7,489	9,789	89,352
Deferred gains or losses on hedges	836	433	3,951
Revaluation reserve for land	33,281	33,060	301,756
Foreign currency translation adjustment	7,069	4,140	37,786
Remeasurements of defined benefit plans	(8,244)	(5,114)	(46,673)
Total accumulated other comprehensive income	40,431	42,309	386,172
Non-controlling interests	19,377	20,067	183,157
Total net assets	465,340	519,433	4,741,082
Total liabilities and net assets	1,074,983	1,076,381	9,824,584

Consolidated Statements of Income

(¥ in millions, US$ in thousands)

	Results for the year ended Dec.31 2018 and 2019		
	2018	2019	2019
	¥	¥	$
Net sales	992,136	906,454	8,273,583
Cost of sales	705,003	671,157	6,125,928
Gross profit	287,133	235,297	2,147,655
Selling, general and administrative expenses	107,130	114,499	1,045,081
Operating income	180,003	120,798	1,102,574
Non-operating income			
Interest income	809	1,112	10,148
Dividends income	1,545	1,456	13,289
Equity in earnings of affiliates	1,253	748	6,826
Rent income on noncurrent assets	1,366	1,351	12,327
Miscellaneous income	1,248	1,530	13,961
Total non-operating income	6,221	6,196	56,551
Non-operating expenses			
Interest expenses	2,983	2,255	20,587
Loss on mothballing of operation	1,479	1,444	13,176
Environmental expenses	462	1,231	11,234
Miscellaneous expenses	2,497	2,771	25,292
Total non-operating expenses	7,420	7,701	70,289
Ordinary income	178,804	119,293	1,088,836
Extraordinary income			
Gain on sales of noncurrent assets	203	701	6,396
Gain on sales of investment securities	1,521	1,743	15,911
Gain on sale of businesses	—	312	2,850
Other	376	174	1,588
Total extraordinary income	2,100	2,930	26,744
Extraordinary loss			
Loss on sales and retirement of noncurrent assets	5,196	5,156	47,061
Impairment loss	22,573	15,662	142,956
Other	7,626	3,522	32,148
Total extraordinary losses	35,395	24,340	222,165
Profit before income taxes	145,509	97,883	893,415
Income taxes	28,756	22,582	206,116
Net income	116,752	75,300	687,299
Net income attributable to non-controlling interests	5,249	2,212	20,190
Net income attributable to owners of the parent	111,503	73,088	667,108

Consolidated Statements of Comprehensive Income

(¥ in millions, US$ in thousands)

	Results for the year ended Dec.31 2018 and 2019		
	2018	2019	2019
	¥	¥	$
Profit	116,752	75,300	687,299
Other comprehensive income:			
Valuation difference on available-for-sale securities	(9,127)	2,333	21,295
Deferred gains or losses on hedges	(2,942)	(406)	(3,703)
Foreign currency translation adjustments	(7,667)	(2,992)	(27,309)
Remeasurements of defined benefit plans, net of tax	(3,556)	3,131	28,582
Share of other comprehensive income of entities accounted for using equity method	(1,405)	(59)	(542)
Total other comprehensive income	(24,697)	2,007	18,323
Comprehensive income	92,055	77,308	705,622
(Comprehensive income attributable to)			
Comprehensive income attributable to owners of the parent	87,463	75,187	686,267
Comprehensive income attributable to non-controlling interests	4,593	2,121	19,355

Consolidated Statements of Changes in Net Assets

For the year ended December 31, 2018 (¥ in millions)

	Shareholders' equity					Valuation and translation adjustments							
	Capital stock	Capital surplus	Retained earnings	Treasury stock	Total shareholders' equity	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Revaluation reserve for land	Foreign currency translation adjustment	Remeasurements of defined benefit plans	Total valuation and translation adjustments	Non-controlling interests	Total net assets
Balance at December 31, 2017	140,564	61,663	96,142	(10,503)	287,866	16,547	3,781	29,541	15,452	(4,716)	60,606	16,524	364,997
Cumulative effects of changes in accounting policies	-	-	3,934	-	-	-	-	-	64	-	-	-	3,997
Restated balance at December 31, 2017	140,564	61,663	100,076	(10,503)	291,800	16,547	3,781	29,541	15,516	(4,716)	60,670	16,524	368,994
Changes of items during the period													
Dividends from surplus			(10,117)		(10,117)								(10,117)
Net income			111,503		111,503								111,503
Purchase of treasury stock				(10,015)	(10,015)								(10,015)
Disposal of treasury stock		17,248		8,859	26,107								26,107
Increase by increase of consolidated subsidiaries													-
Decrease by increase of consolidated subsidiaries													-
Decrease by decrease of consolidated subsidiaries													-
Change of scope of equity method			(6)		(6)								(6)
Change in treasury shares of parent arising from transactions with non-controlling shareholders		0			0								0
Reversal of revaluation reserve for land			(3,740)		(3,740)								(3,740)
Others													-
Net changes of items other than shareholders' equity						(9,058)	(2,945)	3,740	(8,447)	(3,528)	(20,239)	2,853	(17,387)
Total changes of items during the period	-	17,248	97,641	(1,157)	113,732	(9,058)	(2,945)	3,740	(8,447)	(3,528)	(20,239)	2,853	96,346
Balance at December 31, 2018	140,564	78,911	197,717	(11,659)	405,532	7,489	836	33,281	7,069	(8,244)	40,431	19,377	465,340

For the year ended December 31, 2019 (¥ in millions)

	Shareholders' equity					Total accumulated other comprehensive income							
	Capital stock	Capital surplus	Retained earnings	Treasury stock	Total shareholders' equity	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Revaluation reserve for land	Foreign currency translation adjustment	Remeasurements of defined benefit plans	Total valuation and translation adjustments	Non-controlling interests	Total net assets
Balance at December 31, 2018	140,564	78,911	197,717	(11,659)	405,532	7,489	836	33,281	7,069	(8,244)	40,431	19,377	465,340
Cumulative effects of changes in accounting policies													
Restated balance at December 31, 2018	140,564	78,911	197,717	(11,659)	405,532	7,489	836	33,281	7,069	(8,244)	40,431	19,377	465,340
Changes of items during the period													
Dividends from surplus			(21,924)		(21,924)								(21,924)
Net income			73,088		73,088								73,088
Purchase of treasury stock				(8)	(8)								(8)
Disposal of treasury stock		0		3	3								3
Increase by increase of consolidated subsidiaries			448		448								448
Decrease by increase of consolidated subsidiaries			(367)		(367)								(367)
Decrease by decrease of consolidated subsidiaries													-
Change of scope of equity method													-
Change in treasury shares of parent arising from transactions with non-controlling shareholders		1			1								1
Reversal of revaluation reserve for land			285		285								285
Others													-
Net changes of items other than shareholders' equity						2,301	(404)	(221)	(2,929)	3,130	1,878	690	2,568
Total changes of items during the period	-	1	51,529	(5)	51,525	2,301	(404)	(221)	(2,929)	3,130	1,878	690	54,093
Balance at December 31, 2019	**140,564**	**78,912**	**249,246**	**(11,664)**	**457,057**	**9,789**	**433**	**33,060**	**4,140**	**(5,114)**	**42,309**	**20,067**	**519,433**

For the year ended December 31, 2019 (US$ in thousands)

	Shareholders' equity					Total accumulated other comprehensive income							
	Capital stock	Capital surplus	Retained earnings	Treasury stock	Total shareholders' equity	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Revaluation reserve for land	Foreign currency translation adjustment	Remeasurements of defined benefit plans	Total valuation and translation adjustments	Non-controlling interests	Total net assets
Balance at December 31, 2018	1,282,982	720,255	1,804,642	(106,419)	3,701,460	68,352	7,634	303,772	64,518	(75,246)	369,029	176,863	4,247,352
Cumulative effects of changes in accounting policies										-			
Restated balance at December 31, 2018	1,282,982	720,255	1,804,642	(106,419)	3,701,460	68,352	7,634	303,772	64,518	(75,246)	369,029	176,863	4,247,352
Changes of items during the period													
Dividends from surplus			(200,114)		(200,114)								(200,114)
Net income			667,108		667,108								667,108
Purchase of treasury stock				(72)	(72)								(72)
Disposal of treasury stock		0		25	25								25
Increase by increase of consolidated subsidiaries			4,089		4,089								4,089
Decrease by increase of consolidated subsidiaries			(3,353)		(3,353)								(3,353)
Decrease by decrease of consolidated subsidiaries													-
Change of scope of equity method													-
Change in treasury shares of parent arising from transactions with non-controlling shareholders		8			8								8
Reversal of revaluation reserve for land			2,600		2,600								2,600
Others													-
Net changes of items other than shareholders' equity						21,001	(3,683)	(2,015)	(26,732)	28,573	17,143	6,294	23,437
Total changes of items during the period	-	8	470,331	(47)	470,293	21,001	(3,683)	(2,015)	(26,732)	28,573	17,143	6,294	493,730
Balance at December 31, 2019	**1,282,982**	**720,263**	**2,274,973**	**(106,465)**	**4,171,753**	**89,352**	**3,951**	**301,756**	**37,786**	**(46,673)**	**386,172**	**183,157**	**4,741,082**

Consolidated Statements of Cash Flows

(¥ in millions, US$ in thousands)

	Results for the year (Jan. 1-Dec. 31)		
	2018	2019	2019
	¥	¥	$
Net cash provided by (used in) operating activities			
Income before income taxes and minority interests	145,509	97,883	893,415
Depreciation and amortization	39,459	37,704	344,141
Impairment loss	22,573	15,662	142,956
Amortization of goodwill	-	98	894
Amortization of negative goodwill	(19)	-	-
Increase (decrease) in allowance for doubtful accounts	(2,134)	(700)	(6,390)
Increase (decrease) in provision for business structure improvement	(704)	(494)	(4,511)
Increase (decrease) in provision for loss on guarantees	(2,640)	-	-
Increase (decrease) in net defined benefit liability	3,522	(11,757)	(107,308)
Interest and dividends income	(2,354)	(2,568)	(23,437)
Interest expenses	2,983	2,255	20,587
Equity in (earnings) losses of affiliates	(1,253)	(748)	(6,826)
Loss (gain) on sales and valuation of investment securities	1,062	(1,735)	(15,833)
Loss on retirement of noncurrent assets	4,851	5,070	46,279
Loss (gain) on sales of noncurrent assets	141	(615)	(5,614)
Decrease (increase) in notes and accounts receivable-trade	(29,583)	33,489	305,671
Decrease (increase) in inventories	(40,469)	(21,585)	(197,020)
Increase (decrease) in notes and accounts payable-trade	20,397	(21,898)	(199,870)
Other, net	6,162	(25,591)	(233,577)
Subtotal	167,506	104,472	953,558
Interest and dividends income received	4,005	3,431	31,312
Interest expenses paid	(4,269)	(2,326)	(21,233)
Income taxes paid	(17,457)	(27,022)	(246,646)
Net cash provided by (used in) operating activities	149,785	78,554	716,991
Net cash provided by (used in) investing activities			
Payments into time deposits	(172)	(53)	(484)
Proceeds from withdrawal of time deposits	210	53	479
Purchase of property, plant and equipment	(41,269)	(40,708)	(371,559)
Proceeds from sales of property, plant and equipment	392	1,251	11,414
Purchase of investment securities	(703)	(864)	(7,888)
Proceeds from sales of investment securities	3,975	5,677	51,814
Purchase of investments in subsidiaries resulting in change in scope of consolidation	-	(4,851)	(44,278)
Proceeds from sales of investments in subsidiaries resulting in change in scope of consolidation	-	529	4,826
Net decrease (increase) in short-term loans receivable	197	450	4,108
Payments of long-term loans receivable	(2,950)	(558)	(5,097)
Collection of long-term loans receivable	672	289	2,636
Other, net	(9,690)	(9,369)	(85,513)
Net cash provided by (used in) investing activities	(49,338)	(48,156)	(439,542)
Net increase (decrease) in short-term loans payable	(24,507)	(9,545)	(87,121)
Net increase (decrease) in commercial papers	15,000	(20,000)	(182,548)
Proceeds from long-term loans payable	33,206	64,396	587,768
Repayment of long-term loans payable	(81,559)	(47,206)	(430,873)
Proceeds from issuance of bonds	-	20,000	182,548
Purchase of treasury shares	(10,016)	(9)	(81)
Proceeds from sales of treasury shares	26,104	0	1
Cash dividends paid	(10,084)	(21,861)	(199,531)
Cash dividends paid to non controlling shareholders	(2,365)	(1,329)	(12,133)
Other, net	(6,840)	(2,992)	(27,306)
Net cash provided by (used in) financing activities	(61,061)	(18,546)	(169,276)
Effect of exchange rate change on cash and cash equivalents	(3,231)	(2,388)	(21,792)
Net increase (decrease) in cash and cash equivalents	36,154	9,464	86,381
Cash and cash equivalents at beginning of period	76,833	112,835	1,029,893
Increase in cash and cash equivalents from newly consolidated subsidiary	-	310	2,826
Decrease in cash and cash equivalents resulting from exclusion of subsidiaries	(153)	(875)	(7,982)
Cash and cash equivalents at end of period	112,835	121,734	1,111,118

SEGMENT INFORMATION

(a) The operations of the Companies for the year ended December 31, 2018 and 2019 were summarized by business segment as follows:

Year ended December 31, 2018	Millions of yen							
	Petrochemicals	Chemicals	Electronics	Inorganics	Aluminum	Others	Elimination	Consolidated
Sales								
Outside customers	¥258,035	¥139,041	¥110,440	¥257,525	¥99,078	¥128,017	¥—	¥992,136
Inter-segment	10,844	17,499	1,472	8,624	9,176	9,307	(56,922)	—
Total	268,879	156,541	111,912	266,149	108,254	137,324	(56,922)	992,136
Operating income (loss)	¥20,333	¥17,393	¥13,557	¥132,445	¥4,942	¥1,734	(¥10,400)	¥180,003
Assets	¥156,169	¥218,256	¥135,468	¥300,197	¥150,117	¥158,183	(¥43,406)	¥1,074,983
Depreciation	5,046	8,806	9,845	7,967	5,655	899	1,242	39,459
Amortization of (negative) goodwill	—	(260)	12	8	222	(1)	—	(19)
Investments in non-consolidated subsidiaries and affiliates	10,718	3,421	—	1,824	—	388	—	16,352
Capital expenditures	5,051	8,048	10,083	8,127	5,521	2,406	2,491	41,727

Year ended December 31, 2019	Millions of yen							
	Petrochemicals	Chemicals	Electronics	Inorganics	Aluminum	Others	Elimination	Consolidated
Sales								
Outside customers	**¥240,923**	**¥140,158**	**¥95,702**	**¥221,453**	**¥90,500**	**¥117,717**	**¥—**	**¥906,454**
Inter-segment	**9,755**	**17,322**	**743**	**8,682**	**7,042**	**8,446**	**(51,989)**	**—**
Total	**250,678**	**157,480**	**96,445**	**230,135**	**97,542**	**126,163**	**(51,989)**	**906,454**
Operating income (loss)	**¥17,201**	**¥13,656**	**¥4,880**	**¥89,256**	**¥1,746**	**¥1,819**	**(¥7,759)**	**¥120,798**
Assets	**¥137,504**	**¥230,932**	**¥142,511**	**¥281,757**	**¥135,072**	**¥160,063**	**(¥11,458)**	**¥1,076,381**
Depreciation	**4,136**	**9,267**	**9,269**	**8,048**	**4,820**	**1,526**	**584**	**37,650**
Amortization of (negative) goodwill	**—**	**(163)**	**12**	**8**	**217**	**24**	**—**	**98**
Investments in non-consolidated subsidiaries and affiliates	**10,570**	**3,457**	**—**	**1,754**	**—**	**487**	**—**	**16,268**
Capital expenditures	**4,404**	**11,412**	**10,474**	**11,685**	**8,464**	**2,889**	**888**	**50,216**

Year ended December 31, 2019	Thousands of U.S. dollars							
	Petrochemicals	Chemicals	Electronics	Inorganics	Aluminum	Others	Elimination	Consolidated
Sales								
Outside customers	**$2,199,008**	**$1,279,278**	**$873,514**	**$2,021,295**	**$826,034**	**$1,074,455**	**$—**	**$8,273,583**
Inter-segment	**89,038**	**158,108**	**6,782**	**79,241**	**64,274**	**77,087**	**(474,529)**	**—**
Total	**2,288,046**	**1,437,386**	**880,295**	**2,100,536**	**890,308**	**1,151,542**	**(474,529)**	**8,273,583**
Operating income (loss)	**$156,997**	**$124,644**	**$44,540**	**$814,673**	**$15,939**	**$16,602**	**($70,821)**	**$1,102,574**
Assets	**$1,255,059**	**$2,107,813**	**$1,300,759**	**$2,571,714**	**$1,232,857**	**$1,460,963**	**($104,580)**	**$9,824,584**
Depreciation	**37,750**	**84,587**	**84,602**	**73,454**	**43,993**	**13,930**	**5,330**	**343,646**
Amortization of (negative) goodwill	**—**	**(1,484)**	**107**	**77**	**1,978**	**216**	**—**	**894**
Investments in non-consolidated subsidiaries and affiliates	**96,479**	**31,554**	**—**	**16,010**	**—**	**4,442**	**—**	**148,484**
Capital expenditures	**40,195**	**104,167**	**95,600**	**106,653**	**77,253**	**26,372**	**8,103**	**458,343**

(b) The operations of the Companies for the year ended December 31, 2018 and 2019 were summarized by geographic area as follows:

Year ended December 31, 2018	Millions of yen			
	Japan	Asia	Others	Total
Sales	¥551,333	¥239,885	¥200,919	¥992,136
	Japan	Others	Total	
Tangible fixed assets	¥379,577	¥98,829	¥478,406	

Year ended December 31, 2019	Millions of yen			
	Japan	Asia	Others	Total
Sales	**¥508,672**	**¥225,671**	**¥172,111**	**¥906,454**
	Japan	Others	Total	
Tangible fixed assets	**¥366,375**	**¥106,793**	**¥473,168**	

Year ended December 31, 2019	Thousands of U.S. dollars			
	Japan	Asia	Others	Total
Sales	**$4,642,861**	**$2,059,792**	**$1,570,930**	**$8,273,583**
	Japan	Others	Total	
Tangible fixed assets	**$3,344,061**	**$974,746**	**$4,318,807**	

(c) The impairment loss and the (negative) goodwill of the Companies for the year ended December 31, 2018 and 2019 were summarized by business segment as follows:

Year ended December 31, 2018	Millions of yen							
	Petrochemicals	Chemicals	Electronics	Inorganics	Aluminum	Others	Elimination	Total
Impairment loss	¥7	—	¥4,964	¥79	¥9,642	¥6,016	¥1,864	¥22,573
Goodwill								
Amortization	—	48	44	8	276	27	—	404
Unamortized balance	—	134	244	38	2,278	122	—	2,815
Negative goodwill								
Amortization	—	308	33	—	54	28	—	422
Unamortized balance	—	1,780	293	—	486	17	—	2,575

Year ended December 31, 2019	Millions of yen							
	Petrochemicals	Chemicals	Electronics	Inorganics	Aluminum	Others	Elimination	Total
Impairment loss	**¥2**	**¥2,871**	**¥272**	**¥179**	**¥11,447**	**¥892**	**¥—**	**¥15,662**
Goodwill								
Amortization	**—**	**145**	**44**	**8**	**270**	**27**	**—**	**496**
Unamortized balance	**—**	**3,241**	**199**	**29**	**1,960**	**94**	**—**	**5,524**
Negative goodwill								
Amortization	**—**	**308**	**33**	**—**	**54**	**4**	**—**	**398**
Unamortized balance	**—**	**1,472**	**260**	**—**	**432**	**13**	**—**	**2,178**

Year ended December 31, 2019	Thousands of U.S. dollars							
	Petrochemicals	Chemicals	Electronics	Inorganics	Aluminum	Others	Elimination	Total
Impairment loss	**$15**	**$26,203**	**$2,482**	**$1,637**	**$104,479**	**$8,139**	**$—**	**$142,956**
Goodwill								
Amortization	**—**	**1,327**	**404**	**77**	**2,467**	**249**	**—**	**4,524**
Unamortized balance	**—**	**29,581**	**1,819**	**269**	**17,887**	**862**	**—**	**50,419**
Negative goodwill								
Amortization	**—**	**2,811**	**297**	**—**	**489**	**33**	**—**	**3,630**
Unamortized balance	**—**	**13,437**	**2,374**	**—**	**3,945**	**120**	**—**	**19,876**

SHOWA DENKO K.K.

2/13/2020

2019 Consolidated Financial Results (Summary)

Ⅰ. Results for 2019

1. Summary

(Unit: billions of yen, except for "per share" indicators)

Items	2018 Jan.1 - Dec.31	2019 Jan.1 - Dec.31	Increase/ decrease
Net sales	992.1	906.5	-85.7
Operating income	180.0	120.8	-59.2
Net income attributable to owners of the parent	111.5	73.1	-38.4
Net income attributable to owners of the parent per share	¥758.15	¥501.03	¥-257.12
Stockholders' equity per share	¥3,057.16	¥3,423.25	¥366.09
End of term dividends per share	¥120.00	¥130.00(planned)	¥10.00

2. Net sales and Operating income by Segment (Year to year comparison)

(Unit: billions of yen)

Segment		2018 Jan.1 - Dec.31	2019 Jan.1 - Dec.31	Increase/ decrease
Net sales	Petrochemicals	268.9	250.7	-18.2
	Chemicals	156.5	157.5	0.9
	Electronics	111.9	96.4	-15.5
	Inorganics	266.1	230.1	-36.0
	Aluminum	108.3	97.5	-10.7
	Others	137.3	126.2	-11.2
	Adjustments	-56.9	-52.0	4.9
	Total	992.1	906.5	-85.7
Operating income	Petrochemicals	20.3	17.2	-3.1
	Chemicals	17.4	13.7	-3.7
	Electronics	13.6	4.9	-8.7
	Inorganics	132.4	89.3	-43.2
	Aluminum	4.9	1.7	-3.2
	Others	1.7	1.8	0.1
	Adjustments	-10.4	-7.8	2.6
	Total	180.0	120.8	-59.2

SiC epitaxial wafer business was transferred from the Others segment to the Electronics segment at the beginning of 2019.
The above data for 2018 and 2019 are based on this new segmentation.

3. Net sales and Operating income by Segment (Quarterly transition)

(Unit: billions of yen)

Segment		2019 CQ1 Jan.1 - Mar.31	2019 CQ2 Apr.1 - Jun.30	2019 CQ3 Jul.1 - Sept.30	2019 CQ4 Oct.1 - Dec.31
Net sales	Petrochemicals	62.7	64.8	62.1	61.1
	Chemicals	36.0	37.5	42.1	41.9
	Electronics	20.6	24.0	25.4	26.4
	Inorganics	72.4	70.3	47.4	40.0
	Aluminum	23.8	25.3	24.7	23.8
	Others	32.4	31.9	31.5	30.3
	Adjustments	-13.1	-13.0	-13.1	-12.7
	Total	234.7	240.8	220.1	210.9
Operating income	Petrochemicals	4.0	4.5	4.8	3.9
	Chemicals	2.4	3.1	4.0	4.1
	Electronics	-0.3	1.2	2.0	1.9
	Inorganics	39.5	32.3	13.1	4.4
	Aluminum	0.3	0.2	0.9	0.3
	Others	0.3	0.3	0.3	0.9
	Adjustments	-0.8	-1.6	-1.3	-4.0
	Total	45.4	40.1	23.8	11.5

Ⅱ. Forecast for 2020

1. Summary

(Unit: billions of yen, except for net income/share and cash dividends/share)

Items	2019	2020 Forecast	Increase/ decrease
Net sales	906.5	810.0	-96.5
Operating income	120.8	50.0	-70.8
Net income attributable to owners of the parent	73.1	15.0	-58.1
Net income attributable to owners of the parent per share	¥501.03	¥102.83	¥-398.20
End of term dividends per share	¥130.00(planned)	¥130.00	¥0.00

2. Net sales and Operating income by Segment

(Unit: billions of yen)

Segment		2019	2020 Forecast	Increase/ decrease
Net sales	Petrochemicals	250.7	233.0	-17.7
	Chemicals	157.5	170.0	12.5
	Electronics	96.4	112.0	15.6
	Inorganics	230.1	128.0	-102.1
	Aluminum	97.5	96.0	-1.5
	Others	126.2	125.0	-1.2
	Adjustments	-52.0	-54.0	-2.0
	Total	906.5	810.0	-96.5

Operating income	Petrochemicals	17.2	12.0	-5.2
	Chemicals	13.7	15.0	1.3
	Electronics	4.9	12.0	7.1
	Inorganics	89.3	14.0	-75.3
	Aluminum	1.7	4.0	2.3
	Others	1.8	2.5	0.7
	Adjustments	-7.8	-9.5	-1.7
	Total	120.8	50.0	-70.8

(Note) Amount of "Adjustment" includes company-wide costs which are not allocated to each segment.

Ⅲ. Cash flow

(Unit: billions of yen)

Cash flows from:	2018	2019	Increase/ decrease	2020 Forecast	Increase/ decrease
Operating activities	149.8	78.6	-71.2	55.0	-23.6
Investing activities	-49.3	-48.2	1.2	-50.0	-1.8
Free cash flow	100.4	30.4	-70.0	5.0	-25.4
Financing activities	-61.1	-18.5	42.5	-26.0	-7.5
Other	-3.4	-3.0	0.4	0.0	3.0
Net increase in cash	36.0	8.9	-27.1	-21.0	-29.9

Ⅳ. Reference

(Unit: billions of yen, expect for total number of employees, exchange rate and domestic naphtha price)

Items	2018	2019	Increase/ decrease	2020 Forecast	Increase/ decrease
Capital expenditures	41.7	50.2	8.5	59.1	8.8
Depreciation and amortization	39.5	37.7	-1.8	40.3	2.7
R&D expenditures	19.7	20.6	0.9	22.7	2.1
Gap between interest expense and interest/dividend income	-0.6	0.3	0.9	0.2	-0.1
Total number of employees	10,476	10,813	337	11,084	271
Exchange rate (yen/US$)	110.4	109.1	Yen appriciated by 1.4	105.0	Yen appriciated by 4.1
Domestic naphtha price (yen/kl)	51,100	42,000	-9,100	39,200	-2,800
Interest-bearing debt	288.0	298.5	10.6	300.0	1.5
Total assets	1,075.0	1,076.4	1.4		

Notes : The above forecast is based on the information available as of today and assumptions as of today regarding risk factors that could affect our future performance. Actual results may differ materially from the forecast due to a variety of risk factors, including, but not limited to, the economic conditions, costs of naphtha and other raw materials, demand or market conditions for our products such as graphite electrodes and other commodities, and foreign exchange rates. We undertake no obligation to update the forward-looking statements unless required by law.