



# Management's Discussion and Analysis

## Results of Operations

The Group recorded consolidated net sales of ¥906,454 million (US\$8,274 million) in 2019, down 8.6% from the previous year. Sales in the Chemicals segment increased slightly. However, sales in the other five segments decreased. Sales in the Inorganics segment fell due to a decrease in the sales volume of graphite electrodes resulting from reduced output. Sales in the Petrochemicals segment declined due to lower market prices for petrochemical products.

The cost of sales went down ¥33,846 million, or 4.8%, to ¥671,157 million (US\$6,126 million), reflecting the decrease in net sales.

Selling, general and administrative expenses rose ¥7,369 million, or 6.4%, to ¥114,499 million (US\$1,045 million), due partly to the cost of M&A of Industrielack (ILAG) Group.

R&D expenditures increased ¥2,115 million, or 10.3%, to ¥22,720 million (US\$207 million).

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 five 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.

## Information by Business Segment

### Petrochemicals Segment

In the Petrochemicals segment, net sales fell 6.8%, to ¥250,678 million (US\$2,288 million). In our olefin business, sales volumes of ethylene and propylene increased from the previous year because once-in-four-year maintenance (resulting in the large-scale shutdown of ethylene production) did not take place, as it did in the first half of 2018. However, sales of olefin products fell due to lower market prices of petrochemical products in Asia, a result of easing supply-demand conditions. Sales of organic chemicals decreased due partly to a decline in market prices for vinyl acetate and ethyl acetate. Operating income for this segment decreased 15.4%, to ¥17,201 million (US\$157 million).

### Chemicals Segment

In the Chemicals segment, sales increased 0.6%, to ¥157,480 million (US\$1,437 million). For basic chemicals, sales decreased slightly. Production of liquefied ammonia and chloroprene rubber maintained the same level as the previous year. However, sales of acrylonitrile slowed due to a fall in the market price. Shipment volumes and sales of electronic chemicals decreased due to adjustments in production in the semiconductor and display industries. Sales of industrial gases and functional chemicals were at the same levels as the previous year. In addition, the nonstick chemical coating companies that we have acquired in recent years were consolidated by us. As a result, sales in the Chemicals segment rose. However, operating income for this segment decreased 21.5%, to ¥13,656 million (US\$125 million).

### Electronics Segment

In the Electronics segment, sales decreased 13.8%, to ¥96,445 million (US\$880 million). Sales of HD media fell, 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 data centers declined due to a global slowdown in investment in information technology (IT). Sales of rare earth magnetic alloys decreased due to structural reforms. Sales of compound semiconductors decreased due to lower shipment volumes. Sales of lithium-ion battery (LIB) materials decreased due to a lower shipment volumes, partly from a stagnant EV market in China. For SiC epitaxial wafers, sales declined due mainly to a falloff in exports, despite higher sales volumes of products for use in electric railcars. Operating income for this segment decreased 64.0%, to ¥4,880 million (US\$45 million).

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

### Inorganics Segment

In the Inorganics segment, sales decreased 13.5%, to ¥230,135 million (US\$2,101 million). Sales of graphite electrodes fell due to a reduction in the Company's production and lower sales volumes of graphite electrodes starting from the middle of 2019. We are responding to the weakening supply-demand situation for graphite electrodes (mainly in the European market) that are the result of a slowdown in steel production and the 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 adjusted production in the electronic parts/materials industry, in addition to lower shipment volumes for general-purpose alumina and abrasives. This segment recorded operating income of ¥89,256 million (US\$815 million), down 32.6% from the previous year.

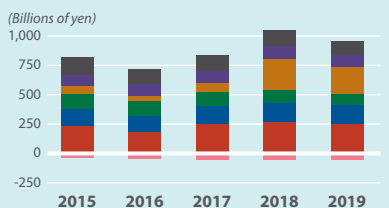
### Aluminum Segment

In the Aluminum segment, sales fell 9.9%, to ¥97,542 million (US\$890 million). Sales of rolled products decreased due to lower shipment volumes of high-purity aluminum foil for capacitors, the result of adjusting production in customer industries, including industrial equipment and automotive parts. Sales of aluminum specialty components decreased due mainly to a decline in shipment volumes of these components for use in automotive parts. Sales of aluminum cans remained at the same level as the previous year. Operating income for this segment decreased 64.7%, to ¥1,746 million (US\$16 million).

### Others Segment

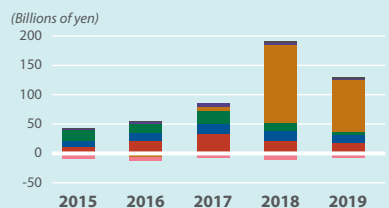
In the Others segment, sales decreased 8.1%, to ¥126,163 million (US\$1,152 million). Shoko Co., Ltd.'s sales decreased due to falling markets for two divisions: Plastics and Metal Ceramics. However, operating income for this segment increased 4.9%, to ¥1,819 million (US\$17 million).

### Net Sales by Segment



Legend: Petrochemicals (Red), Chemicals (Blue), Electronics (Green), Inorganics (Orange), Aluminum (Purple), Others (Grey), Adjustments (Pink)

### Operating Income by Segment



Legend: Petrochemicals (Red), Chemicals (Blue), Electronics (Green), Inorganics (Orange), Aluminum (Purple), Others (Grey), Adjustments (Pink)

## Information by Geographic Area

### Sales in Japan

Sales in the Petrochemicals segment decreased due to a decline in market prices of petrochemical products resulting from lower raw naphtha prices, despite an increase in shipment volumes of products due to recovery from the impact of once-in-four-year large-scale shutdown maintenance of ethylene production facilities, which took place in the first half of 2018. Sales in the Chemicals segment decreased. In the electronic chemicals business, sales decreased due to a decrease in shipment volumes of high-purity gases for electronics resulting from adjustment of production in the semiconductor and display industries. In the basic chemicals business, sales decreased due partly to a decline in market price of acrylonitrile. In the Electronics segment, sales of compound semiconductors and rare earth magnetic alloys decreased due to stagnant shipment volumes. In the Inorganics segment, sales of graphite electrodes increased due to a rise in market prices. However, in the ceramics business, sales of titanium oxide for electronics and heat radiant filler decreased due to adjustment of production by customers. In the Aluminum segment, sales of high-purity aluminum foil for capacitors decreased due partly to a reduction in shipment volumes resulting from production adjustment in the industrial equipment manufacturers. Sales of aluminum specialty components also decreased due to a reduction in shipment volumes of products for use as automotive parts. In the Others segment, sales decreased due to a decline in sales figures of Shoko Co., Ltd. Resulting from a decline in market prices of synthetic resins.

As a result, consolidated sales from operations in Japan decreased ¥42,661 million, or 7.7%, to ¥508,672 million (US\$4,643 million).

### Sales in Asia (excluding Japan)

Sales in the Petrochemicals segment in Asia increased because of an increase in export of olefins due to recovery from the impact of once-in-four-year large-scale shutdown maintenance of ethylene production facilities, which took place in the first half of 2018.

In the Chemicals segment, sales of electronic chemicals decreased due to a reduction in shipment volumes of high-purity gases for electronics resulting from production adjustment in the semiconductor and display industries in East Asia. Sales of functional chemicals decreased due to a reduction in shipment volumes to China. Consolidation of subsidiaries producing coating materials contributed to an increase in sales of chemicals in Asia.

In the Electronics segment, sales of HD media decreased due to a reduction in shipment volumes of media for PCs.

In the Inorganics segment, sales of graphite electrodes decreased due to a decline in shipment volumes caused by reduction of production aiming to cope with softening supply-demand situation.

As a result, consolidated sales from operations in Asia (excluding Japan) decreased ¥14,214 million, or 5.9% from the previous year, to ¥225,671 million (US\$2,060 million).

### Sales in the Rest of the World

Sales in the rest of the world decreased due mainly to a decrease in sales in the Inorganics segment. Though sales of graphite electrodes in the U.S. market increased, sales of graphite electrodes in Europe significantly decreased due to a reduction in the Group's production volumes of graphite electrodes, especially those of our European bases, 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. In the Chemicals segment we newly consolidated coating materials manufacturing companies.

As a result, consolidated sales from operations in the rest of the world decreased ¥28,808 million, or 14.3% from the previous year, to ¥172,111 million (US\$1,571 million).

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

The gap between interest expenses and interest and dividends income improved ¥941 million to the proceeds of ¥321 million (US\$3 million), due mainly to a decrease in interest expense.

We recorded a gain on the equity in earnings of unconsolidated subsidiaries and affiliates to which the equity method is applied of ¥748 million (US\$7 million), a deterioration of ¥505 million. This reduction was due mainly to a decrease in income of a synthetic-resin production company resulting from a sluggish market.

For foreign exchange gain (losses), the Group recorded foreign exchange losses of ¥728 million (US\$6 million) in 2019, a deterioration of ¥381 million from the previous year due mainly to the recording of a foreign exchange loss from a subsidiary manufacturing HD media in Taiwan caused by the appreciation of the New Taiwan dollar against the U.S. dollar. In 2018, however, this HD media manufacturing subsidiary in Taiwan recorded foreign exchange gain due to the depreciation of the New Taiwan dollar against the U.S. dollar.

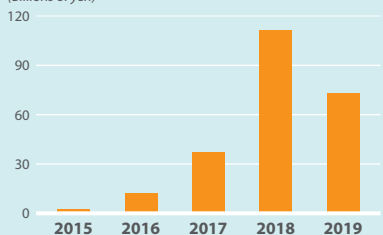
We recorded a loss of ¥4,455 million (US\$41 million), net, on retirement and sales of non-current assets, a decrease of ¥538 million, due mainly to the recording of retirement losses resulting from removal of old facilities that belonged to the Inorganics and Chemicals segments.

We also recorded a loss of ¥15,662 million (US\$143 million) for the impairment loss on fixed assets, a decrease of ¥6,911 million, due partly to our recognition of an impairment loss amounting to ¥2,812 million from the integration of bases to manufacture unsaturated polyester resin and vinyl ester resin in our functional chemicals business, another impairment loss amounting to ¥10,418 million from the business to manufacture aluminum specialty components for the automotive parts industry, and another impairment loss amounting to ¥804 million from the business to manufacture aluminum cans for beverages in Oyama and Hikone plants where the Group streamlined their production capacities.

Gain on sales of investment securities increased ¥222 million from

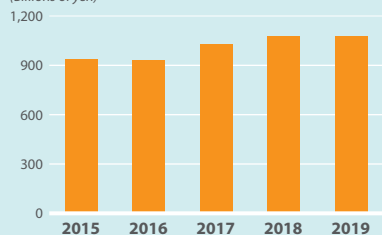
#### Net Income Attributable to Owners of the Parent

(Billions of yen)



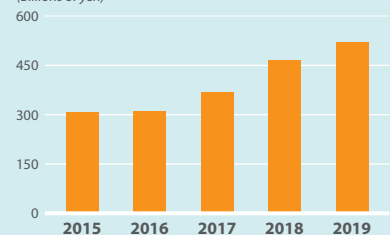
#### Total Assets

(Billions of yen)



#### Total Net Assets

(Billions of yen)



the previous year, to ¥1,743 million (US\$16 million).

The sum of extraordinary losses, other than those mentioned above, decreased ¥4,104 million from the previous year, to ¥3,522 million (US\$32 million), which was due mainly to a decrease in 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, improved by ¥11,885 million, to a loss of ¥21,410 million (US\$195 million).

As a result, the Company recorded income before income taxes and non-controlling interests of ¥97,883 million (US\$893 million), down ¥47,626 million from the previous year.

Income taxes decreased ¥6,174 million to ¥22,582 million (US\$206 million) due to a decrease in the Company's income before income taxes and non-controlling interests. Consequently, the Company recorded net income attributable to owners of the parent of ¥73,088 million (US\$667 million), down ¥38,415 million from the previous year.

## Financial Position

### Total Assets

Total assets at the end of 2019 increased ¥1,398 million from the end of the previous year, to ¥1,076,381 million (US\$9,825 million), due mainly to the increase in inventories resulting from a rise in prices of raw materials for graphite electrodes, despite a decrease in accounts receivable-trade. Cash and deposits increased ¥8,900 million from the end of the previous year, to ¥122,086 million (US\$1,114 million).

Net property, plant and equipment decreased ¥5,238 million, to ¥473,168 million (US\$4,319 million), due mainly to the recording of impairment loss. Total investments and other assets increased ¥6,112 million, to ¥106,156 million (US\$969 million), due mainly to an increase in goodwill.

### Liabilities

Interest-bearing debt increased ¥10,556 million from the end of the previous year, to ¥298,524 million (US\$2,725 million). However, accounts payable-trade decreased due to a fall in price of naphtha as raw material. As a result, total liabilities fell ¥52,695 million from the end of the previous year, to ¥556,949 million (US\$5,084 million).

### Net Assets

Net assets at the end of 2019 amounted to ¥519,433 million (US\$4,741 million), up ¥54,093 million over the previous year, due partly to the recording of net income attributable to owners of the parent.

### Capital Expenditures

Capital expenditures increased ¥8,489 million from the previous year, to ¥50,216 million (US\$458 million). Capital expenditures for the Chemicals segment increased due to investments to increase production capacity of electronic chemicals, capital expenditures for the Inorganics segment

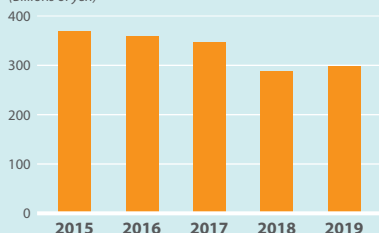
increased due to investment to improve facilities to produce graphite electrodes in Europe. In addition, in the Aluminum segment, capital expenditures rose due to investments to construct the third factory of Hanacans in Vietnam. However, in the Petrochemicals segment, the amount of capital investment fell due to the completion of large-scale periodic shutdown maintenance in the first half of the previous year. In the Electronics segment, capital expenditures for facilities to produce HD media also decreased.

### Cash Flows

Net cash provided by operating activities decreased ¥71,231 million from the previous year, to ¥78,554 million (US\$717 million), due partly to lower income before income taxes and minority interests. Net cash used in investing activities fell ¥1,182 million, to ¥48,156 million (US\$440 million), due partly to an increase in proceeds from sales of investment securities. Therefore, free cash flow was ¥30,397 million (US\$277 million), a decrease in proceeds of ¥70,050 million. Net cash used in financing activities decreased ¥42,516 million due partly to a lower level of repayments of interest bearing debt, ending up at ¥18,546 million (US\$169 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 (US\$1,111 million).

### Interest-Bearing Debt

(Billions of yen)



### Cash Flows from Operating Activities

(Billions of yen)

