



We “Act” to touch the heart and make society better

Second Quarter, 2020 Financial Results

- Consolidated -

SHOWA DENKO K.K.

August 12, 2020

Motohiro Takeuchi, CFO
Representative Director & Managing Corporate Officer

Performance forecast and other statements pertaining to the future as contained in this presentation are 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 influence of the coronavirus disease 2019 (COVID-19) on the world economy, the economic conditions, costs of naphtha and other raw materials, demand for our products such as graphite electrodes and other commodities, market conditions, and foreign exchange rates. We undertake no obligation to update the forward-looking statements unless required by law.

Consolidated Companies

- Consolidated subsidiaries: 152 (newly consolidated: 91 companies related to Hitachi Chemical) (Showa Denko Materials segment)

-Major companies

Hitachi Chemical Co., Ltd.

SD (Shanghai) Co., Ltd.

Hitachi Chemical (Nantong)

Co., Ltd.

Hitachi Chemical Electronic

Materials (Guangzhou) Ltd.

Hitachi Chemical (Suzhou) Co., Ltd.

Hitachi Chemical (Dongguan) Co., Ltd.

PT Hitachi Chemical Indonesia

Hitachi Chemical (Johor) Sdn. Bhd.

Hitachi Chemical Asia (Thailand) Co., Ltd.

Hitachi Chemical Co. America, Ltd.

Hitachi Powdered Metals (USA), Inc.

FIAMM Energy Technology S.p.A.

- Equity method applied: 13 (newly applied: 2 companies, Hitachi Chemical's related companies) (Showa Denko Materials segment)

Hitachi Chemical DuPont MicroSystems L.L.C.

Goi Chemical Co., Ltd.

Selected Data

(Average figure)

	Jan.- Jun., 2019	Jan.- Jun., 2020	Increase/decrease
■ Exchange rates:			
¥/US\$	110.1	108.3	Yen appreciated by 1.8/\$
¥/€	124.3	119.3	Yen appreciated by 5.0/€
■ Domestic naphtha price: ¥/KL	43,300	34,900 (1Q: 44,800, 2Q: 25,000)	-8,400
■ Aluminum			
LME price: US\$/T	1,850	1,619	-231
Domestic market*: K¥/T	255	224	-31

Exchange rate at December 31, 2019 ¥109.6/US\$, at June 30, 2020 ¥107.7/US\$

⇒ Yen appreciated by ¥1.8/US\$

*Domestic market:
data from Nikkei

Summary 2019 (Jan.1 – Jun.30) vs. 2020 (Jan.1 – Jun.30)

(Unit: Billions of yen except cash dividends per share)

	Jan.-Jun., 2019	Jan.-Jun., 2020	Increase/decrease
Net sales	475.5	326.6	-148.9
Operating income	85.5	-25.8	-111.3
Non-operating income and expenses, net	-0.6	-17.4	-16.8
Interest/Dividends income and expenses	0.2	-0.9	-1.1
Equity in earnings of affiliates	0.5	0.4	-0.1
Foreign exchange gains or losses	0.1	0.0	-0.1
Other	-1.4	-17.0	-15.5
Ordinary income	84.8	-43.2	-128.1
Extraordinary profit	1.8	2.1	0.3
Extraordinary loss	-3.0	-8.5	-5.5
Income before income taxes	83.6	-49.6	-133.2
Income taxes	-16.2	-1.7	14.5
Profit	67.5	-51.3	-118.8
Net income attributable to non-controlling interests	-1.7	-3.3	-1.6
Net income attributable to owners of the parent	65.8	-54.6	-120.4
Midterm dividends per share (yen)	50	0	-50

Special factors (impacted on first half results)

(Unit: Billions of Yen)

Major item	Breakdown	Amount
Petrochemical	Negative influence of the difference between the receipts and disbursements of raw materials, reflecting the sharp decline in naphtha prices, time-lag factor	8.5
Graphite Electrodes	Devaluation of inventory in accordance with the “lower of cost or market” accounting method	21.7
Influence of the coronavirus disease 2019 (COVID-19) to operating income		2.0
Influence of the integration with Hitachi Chemical Co., Ltd (HC)	Advisory fee, attorney’s fee, etc. (Operating expenses)	3.5
	Post-merger integration (PMI) expenses* (Operating expenses)	0.8
	Expenses related to fund-raising, registration tax, etc. (Non-operating expenses)	16.1
	Interest on borrowing related to share acquisition, etc. (Non-operating expenses)	1.2
Influence of the integration with HC (first half)		21.6
Extraordinary loss	Closure of Meitingen Plant, Germany, in the graphite electrode business	4.7
Total amount of special factors in first half		58.5

*PMI expenses: expenses related to merger processes such as management and operation to maximize the effect of integration after merger.

Extraordinary Profit/Loss

(Unit: Billions of Yen)

	Jan.-Jun., 2019	Jan.-Jun., 2020	Increase/decrease
■ Extraordinary profit	1.8	2.1	0.3
● Gain on sales of non-current assets	0.5	1.6	1.1
● Other	1.3	0.5	-0.8
■ Extraordinary loss	-3.0	-8.5	-5.5
● Loss on sales and retirement of non-current assets	-1.0	-1.5	-0.5
● Business restructuring expenses	—	-5.3	-5.3
● Other	-2.0	-1.7	0.3
■ Extraordinary profit/loss, net	-1.2	-6.4	-5.2

Consolidated Sales and Operating Income by Segment (1)

(Unit: Billions of Yen)

		Jan.-Jun. 2019	Jan.-Jun. 2020	Increase/ decrease	Item
Petro-chemicals	Sales	127.5	95.7	-31.7	Olefins: sales decreased (market prices down, shipment volumes down) Organic chemicals: sales decreased (vinyl acetate, ethyl acetate: shipment volumes down due to shutdown maintenance, market prices down) SunAllomer Ltd.: sales decreased (market prices down, shipment volumes down)
	Operating income	8.5	-3.7	-12.1	Olefins: profit decreased (depreciation of naphtha inventory due to a fall in market price, spread squeezed, shipment volumes down) Organic chemicals: profit decreased (vinyl acetate, ethyl acetate: shipment volumes down, market prices down) SunAllomer Ltd.: profit decreased (shipment volumes down)
Chemicals	Sales	73.5	72.0	-1.5	Basic chemicals: sales decreased (ammonia: shipment volumes down, AN: market prices down, chloroprene rubber: shipment volumes for export down) Electronic chemicals: sales increased (shipment volumes up) Industrial gases: sales decreased (shipment volumes down) Functional chemicals: sales decreased (shipment volumes down) Coating materials: newly consolidated in 2H, 2019
	Operating income	5.5	5.0	-0.5	Basic chemicals: profit decreased (ammonia: profit up, AN, chloroprene rubber: profit down) Electronic chemicals: profit increased (shipment volumes up) Industrial gases: profit slightly decreased Functional chemicals: profit decreased (shipment volumes down)
Electronics	Sales	44.6	44.6	-0.0	HDs: sales slightly increased Compound semiconductors: sales increased (shipment volumes for export up) LIB materials: sales increased (shipment volumes of SPALF™ up) SiC epitaxial wafers: sales decreased (steady in domestic market, shipment volumes for export down)
	Operating income	0.9	1.8	0.8	HDs: profit slightly decreased Compound semiconductors: profit increased (shipment volumes for export up) LIB materials: profit increased (shipment volumes of SPALF™ up, cost reduction) SiC epitaxial wafers: profit decreased (shipment volumes for export down)

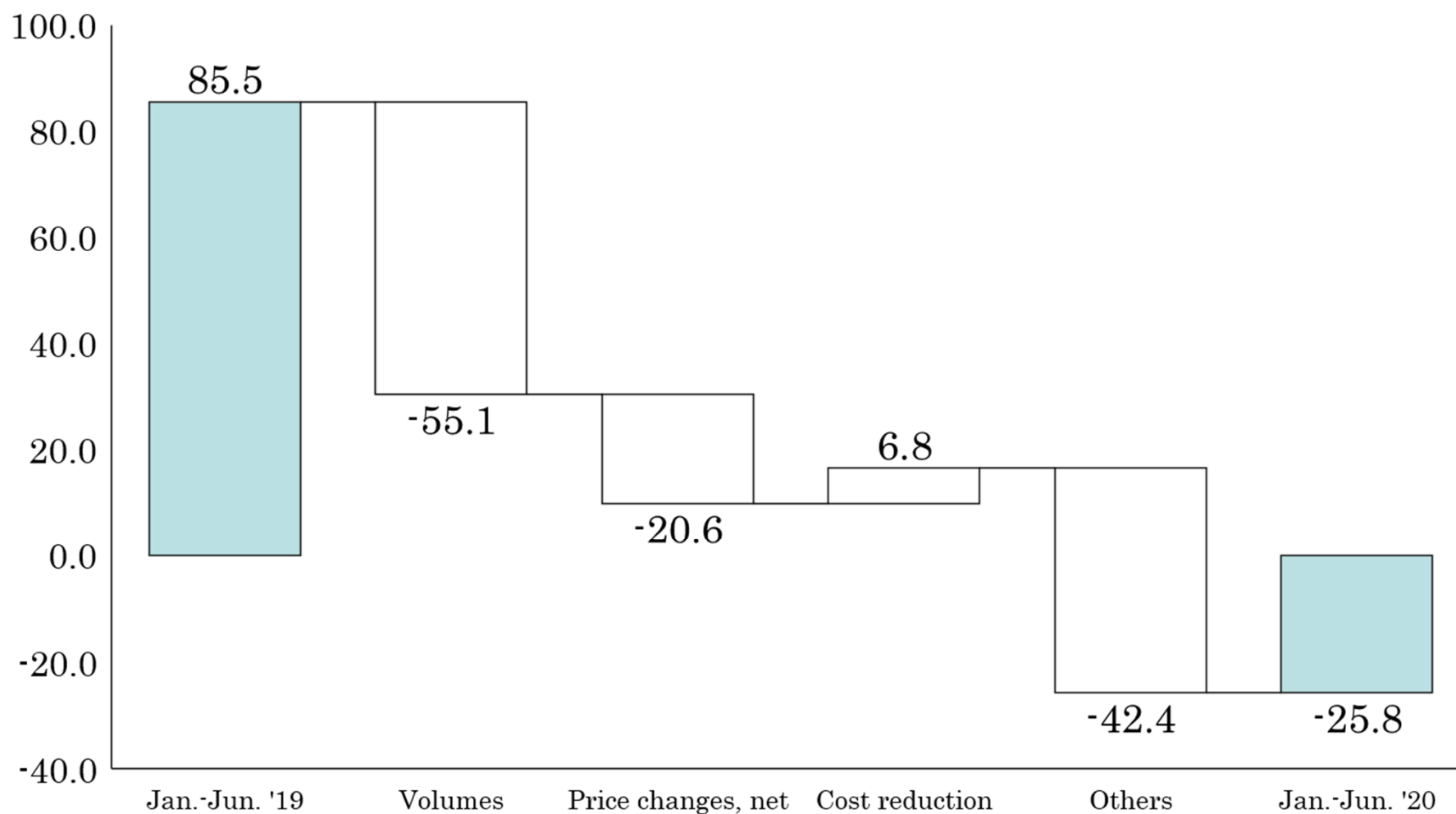
Consolidated Sales and Operating Income by Segment (2)

(Unit: Billions of Yen)

		Jan.-Jun. 2019	Jan.-Jun. 2020	Increase/ decrease	Item
Inorganics	Sales	142.7	43.0	-99.7	Ceramics: sales decreased (shipment volumes of abrasives for auto and steel industry down) Graphite electrodes: sales significantly decreased (shipment volumes down due to further reduced production, market prices down)
	Operating income	71.8	-22.9	-94.7	Ceramics: profit maintained at the year-earlier level Graphite electrodes: profit significantly decreased (devaluation of inventory in accordance with the “lower of cost or market” accounting method, shipment volumes down due to further reduced production, market prices down)
Aluminum	Sales	49.0	38.8	-10.2	High-purity foil for capacitors: sales decreased (shipment volumes down) Aluminum specialty components: sales decreased (shipment volumes for auto application down) Aluminum cans: sales decreased (shipment volumes for Japan and Vietnam down)
	Operating income	0.5	-0.2	-0.7	High-purity foil for capacitors: profit increased Aluminum specialty components: profit decreased (shipment volumes down) Aluminum cans: profit decreased (shipment volumes for Japan and Vietnam down)
Others	Sales	64.3	55.6	-8.7	
	Operating income	0.6	0.5	-0.1	
Adjustments	Sales	-26.1	-23.2	3.0	
	Operating income	-2.4	-6.3	-3.9	Expenses related to the acquisition of Hitachi Chemical Company, Ltd.’s shares
Total	Sales	475.5	326.6	-148.9	
	Operating income	85.5	-25.8	-111.3	

Operating Income Breakdown by Factor

(Unit: Billions of Yen)



Consolidated Balance Sheet

(Unit: Billions of Yen)

Assets	Dec. 31, 2019	June. 30, 2020	Increase/ decrease	Liabilities and net assets	Dec. 31, 2019	June. 30, 2020	Increase/ decrease
Cash and deposits	122.1	198.6	76.6	Notes and accounts payable	117.5	153.9	36.4
Notes and accounts receivable	170.3	248.3	78.0	Interest-bearing debt	298.5	997.6	699.1
Inventories	173.7	239.6	65.9	Net defined benefit liability	10.0	26.2	16.2
Other current assets	31.0	59.0	28.0	Other liabilities	130.9	201.1	70.1
<u>Total current assets</u>	497.1	745.6	248.5	<u>Total liabilities</u>	556.9	1,378.8	821.8
Buildings and structures	77.1	142.8	65.7	Capital stock	140.6	140.6	0
Machinery and equipment	140.3	221.5	81.1	Capital surplus	78.9	78.9	-0
Land	224.0	248.2	24.2	Retained earnings	249.2	183.5	-65.8
Other tangible fixed assets	31.7	102.7	71.0	Treasury stock	-11.7	-11.7	0
<u>Total tangible fixed assets</u>	473.2	715.3	242.1	<u>Total shareholders' equity</u>	457.1	391.3	65.8
Goodwill	3.3	482.2	478.9	Valuation difference on available-for-sale securities	9.8	3.7	-6.1
Other intangible fixed assets	19.3	30.3	11.0	Deferred gains or losses on hedges	0.4	-0.4	-0.8
<u>Total intangible fixed assets</u>	22.6	512.5	489.9	Revaluation reserve for land	33.1	32.8	-0.2
Investments and other assets	83.5	132.9	49.4	Foreign currency translation adjustment	4.1	-0.8	-4.9
incl. investment securities	71.8	82.7	10.9	Remeasurements of defined benefit plans	-5.1	-4.9	0.2
				<u>Total accumulated other comprehensive income</u>	42.3	30.4	-11.9
				Non-controlling interests	20.1	305.8	285.7
<u>Total fixed assets</u>	579.3	1,360.7	781.4	<u>Total net assets</u>	519.4	727.5	208.1
Total assets	1,076.4	2,106.3	1,029.9	Total liabilities and net assets	1,076.4	2,106.3	1,029.9

Showa Denko K.K. has made Hitachi Chemical Company, Ltd. a consolidated subsidiary, considering the end of this second quarter (June 30, 2020) as acquisition date, and consolidated Hitachi Chemical's financial results into Showa Denko's consolidated financial statements.

Influence of integration with Hitachi Chemical to Balance Sheets

(Unit: Billions of Yen)

Jun. 30, 2020

● Increase in total assets	1,100.2
● Increase in current assets	306.8
● Increase in intangible fixed assets^{*1}	489.8
● Increase in liabilities	538.2
(Interest-bearing debt^{*2}	366.9)
● Non-controlling interests	284.0

*1 Amount of goodwill is calculated by tentative treatment before Purchase Price Allocation (PPA) .

*2 In October 2020, Hitachi Chemical Company, Ltd. is scheduled to deliver 120.0 billion yen, which is equivalent to the total value of fractional shares, to shareholders who have fractional shares which are realized due to consolidation of shares. Because of this, Interest-bearing debt will increase by the same amount.

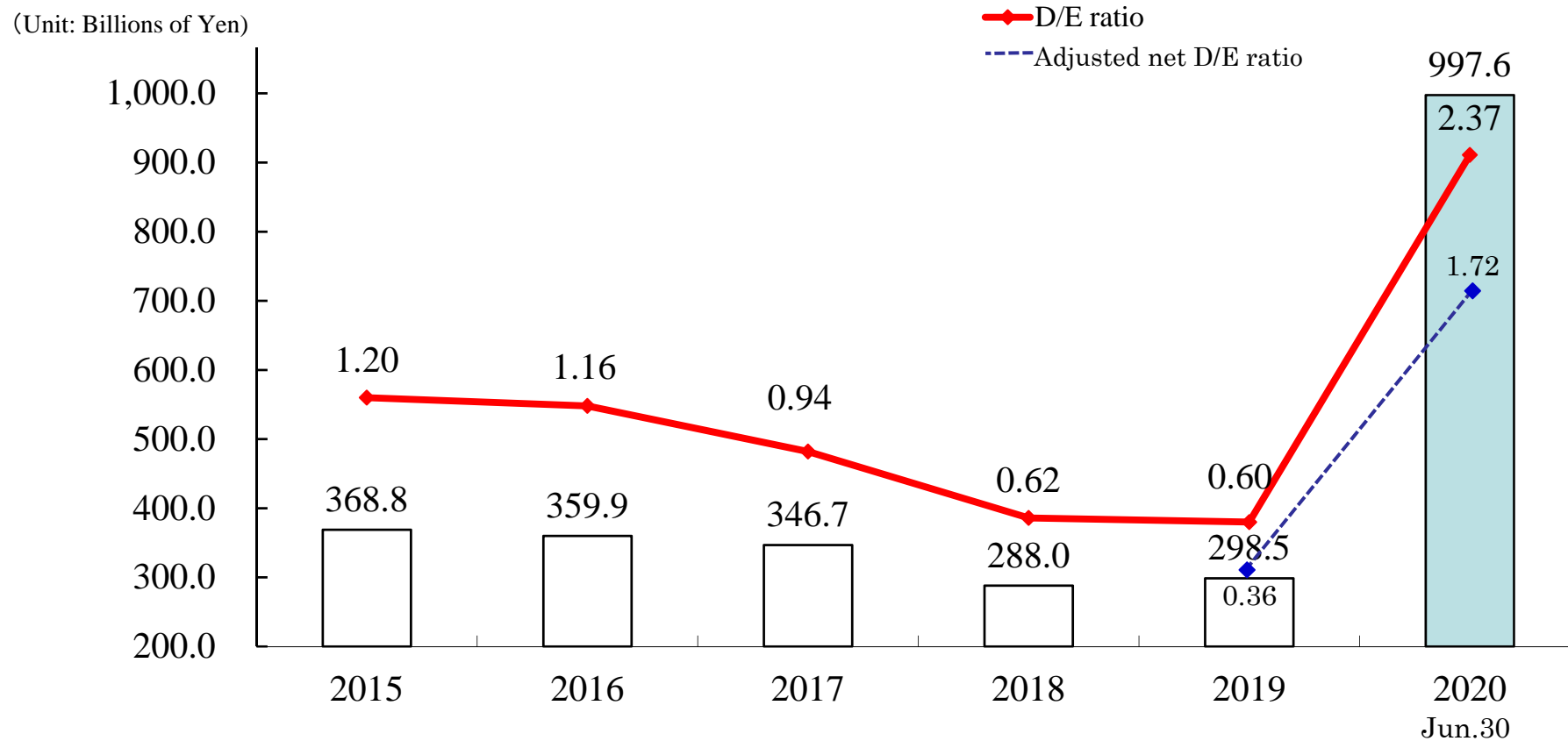
Total Assets Interest-bearing Debt and D/E ratio

(Unit: Billions of Yen)

	Dec. 31, 2019	June. 30, 2020	Increase/ decrease
● Total assets	1,076.4	2,106.3	1,029.9
● Interest-bearing debt	298.5	997.6	699.1
● Debt/Equity ratio	0.60 times (Adjusted net D/E ratio 1.72 times)	2.37 times	1.77p
● Stockholders' Equity ratio	46.4%	20.0%	-26.4p

(note) In accordance with the consolidation of Hitachi Chemical Company, Ltd., SDK will calculate its D/E ratio with an assumption as follows, starting from the third quarter of the fiscal year ending December 31, 2020. Regarding preferred stocks issued by HC Holdings K.K., which is a subsidiary of SDK, we will add the amount equivalent to 50% of the value of issued preferred stocks to interest-bearing debts and the remaining 50% of it to the equity capital of SDK. We will also add lease liability to the equity capital of SDK, and use net interest-bearing debt (interest-bearing debt minus cash and deposits) in calculation of D/E ratio. For reference, if we used this assumption in calculation of D/E ratio at the end of the first half of 2020, D/E ratio would be 1.72 times. The assumption that we consider 50% of the total value of issued preferred stocks as equity capital is based on the credit rating given by Japan Credit Rating Agency, Ltd. on April 21, 2020.

Interest-bearing Debt



Equity ratio	31.5%	31.8%	34.3%	41.5%	46.4%	20.0%
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Consolidated Cash Flows

(Unit: Billions of Yen)

	Jan.-Jun. 2019	Jan.-Jun. 2020	Increase/ decrease
●CF from operating activities	40.5	5.2	-35.3
●CF from investing activities	-17.9	-792.6	-774.7
●Free CF	22.6	-787.4	-810.0
●CF from financing activities	-18.7	864.7	883.4
●Others	-3.3	-1.6	1.8
Increase/decrease in cash and cash equivalents	0.6	75.8	75.2

Selected Data (Consolidated)

(Unit: Billions of Yen)

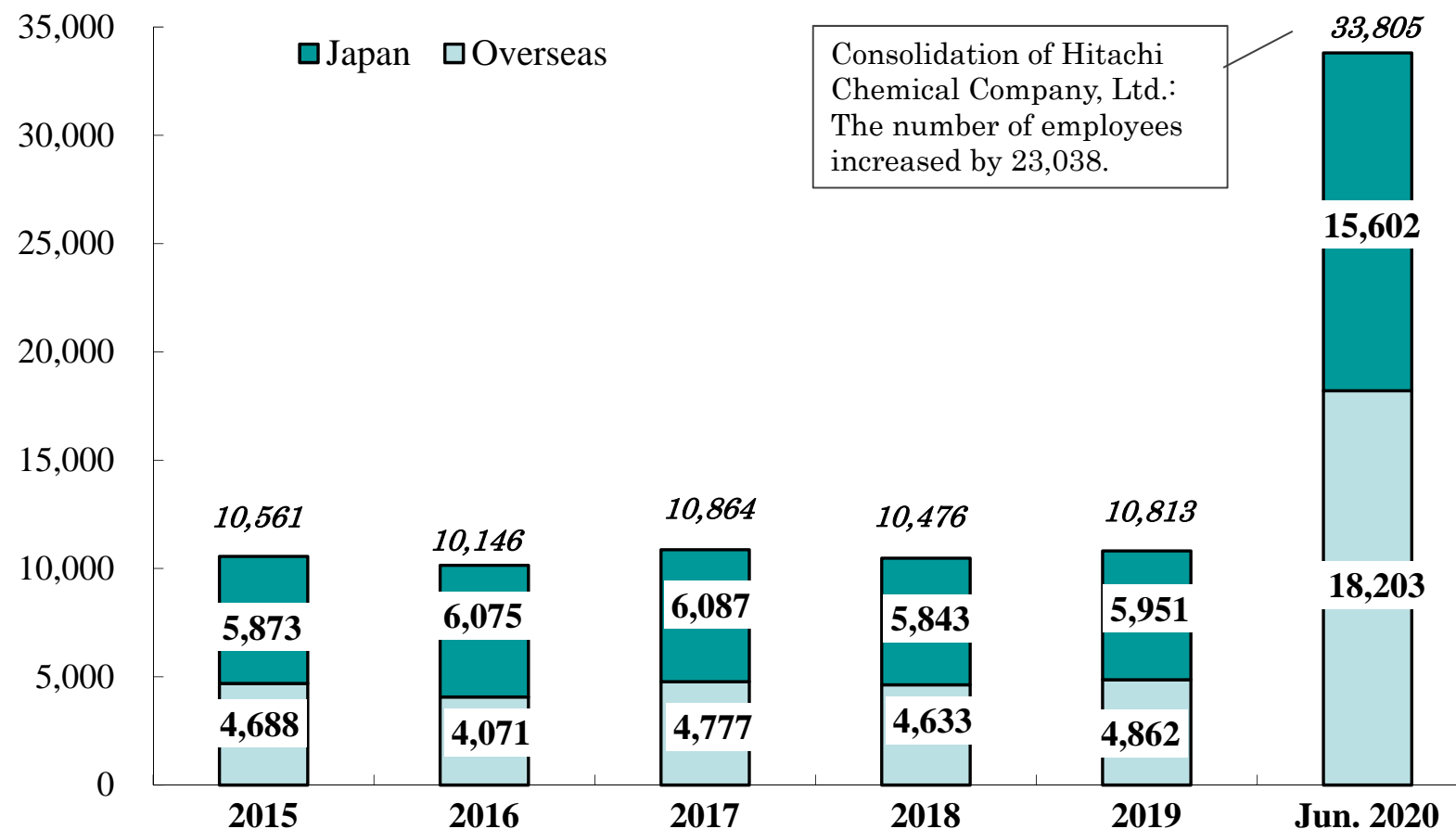
	Jan.-Jun. 2019	Jan.-Jun. 2020	Increase/ decrease
● Interest/dividend income less interest expenses	0.2	-0.9	-1.1
● Capital expenditures	22.3	24.8	2.5
● Depreciation and amortization	18.6	19.4	0.8
● R&D expenditures	10.1	9.7	-0.3
● Number of employees (Unit: people)	10,603	33,805	23,202
● Total employment cost	42.3	40.3	-2.0

Capital Expenditures/ Depreciation by Segment

(Unit: Billions of Yen)

	Jan.-Jun., 2019		Jan.-Jun., 2020		Increase/decrease	
	Capital expenditures	Depreciation	Capital expenditures	Depreciation	Capital expenditures	Depreciation
Petrochemicals	2.3	2.1	2.8	2.1	0.6	0
Chemicals	4.5	4.5	6.9	4.7	2.4	0.2
Electronics	5.4	4.6	4.2	4.8	-1.2	0.2
Inorganics	3.7	4.1	4.1	4.2	0.4	0.1
Aluminum	4.5	2.4	5.2	2.1	0.7	-0.3
Others	2.0	1.0	1.6	1.5	-0.4	0.6
Total	22.3	18.6	24.8	19.4	2.5	0.8

Total Number of Employees and Breakdown by Location



Japan	55.6%	59.9%	56.0%	55.8%	55.0%	46.2%
Overseas	44.4%	40.1%	44.0%	44.2%	45.0%	53.8%

Selected Data, Forecast

(Unit: Billions of Yen)

	2019 Actual		2020 Revised Forecast*		Increase/ decrease
● Exchange rate: ¥/US\$	1H	110.1	1H actual	108.3	1H Yen appreciated by 1.8
	2H	108.1	2H revised	105.0	2H Yen appreciated by 3.1
	¥/€				
● Domestic naphtha price: ¥/KL	1H	124.3	1H actual	119.3	1H Yen appreciated by 5.0
	2H	119.8	2H revised	115.0	2H Yen appreciated by 4.8
● Aluminum LME price: US\$/T	1H	43,300	1H actual	34,900	1H -8,400
	2H	40,750	2H revised	25,100	2H -15,650
● Interest-bearing debt at the year end		298.5		1,115.5	817.0
● Interest/dividend income less interest expenses		0.3		-5.3	-5.6
● R&D expenditures		20.6		37.0	16.4

* 2020 revised forecast was announced on Aug. 12, 2020.

2020 Forecast

(Unit: Billions of Yen except Cash dividends per Share and Net income per Share)

	2019 Actual	2020 Revised Forecast*	Increase/ decrease	2020	
				First half	Second half
Net sales	906.5	960.0	53.5	326.6	633.4
Operating income	120.8	-30.0	-150.8	-25.8	-4.2
Non-operating income and expense	-1.5	-25.0	-23.5	-17.4	-7.6
Ordinary income	119.3	-55.0	-174.3	-43.2	-11.8
Extraordinary profit	-21.4	-24.0	-2.6	-6.4	-17.6
Extraordinary loss					
Net income attributable to owners of the parent	73.1	-90.0	-163.1	-54.6	-35.4
Net income attributable to owners of the parent per share (yen)	501.03	-616.94	-1,117.97		
Cash dividends per share (yen)	130 (Q2) 50 (Q4) 80	Undecided (planned) (Q2) 0 (Q4) Undecided (planned)	—		

* 2020 revised forecast was announced on Aug. 12, 2020.

(note) Showa Denko K.K. consolidated financial results of Hitachi Chemical Company, Ltd. into its consolidated financial statements, considering the end of the second quarter (June 30, 2020) as acquisition date. Forecast of performance for the year ending December 31, 2020 includes forecast of Hitachi Chemical's financial results for the second half of 2020 (July 1 to December 31, 2020).

Special factors (impact on full year results)

(Unit: Billions of Yen)

Major item	Breakdown	Amount	Note
Petrochemical	Negative influence of the difference between the receipts and disbursements of raw materials, reflecting the sharp decline in naphtha prices, time-lag factor	8.5	Temporary
Influence of COVID-19	Chemicals segment	3.0	Temporary
	Electronics segment	1.5	
	Aluminum segment	2.0	
	Showa Denko Materials segment	13.0	
	Other	0.5	
	Influence of COVID-19 to operating income	20.0	
Graphite Electrodes	Slowdown in global steel production	26.0	Temporary
	Devaluation of inventory in accordance with the “lower of cost or market” accounting method	10.7	
Influence of the integration with Hitachi Chemical Co., Ltd. (HC)	Advisory fee, attorney’s fee, etc. (Operating expenses)	3.5	Temporary
	Post-merger integration (PMI) expenses* (Operating expenses)	4.6	Continuous
	Adjustment of cost of sales on a consolidated basis due to market valuation of inventories on consolidation (Operating expenses)	11.8	Temporary
	Amortization of goodwill, etc. (second half) (Operating expenses)	18.7	Continuous
	Influence to operating income	103.8	
Influence of the integration with HC	Expenses related to fund-raising, registration tax, etc. (Non-operating expenses)	16.1	Temporary
	Interest on borrowing related to share acquisition, etc. (Non-operating expenses)	5.3	Continuous
	Total of non-operating expenses	21.4	
Extraordinary loss	Closure of Meitingen Plant, Germany, in the graphite electrode business	4.7	Temporary
Influence of the integration with HC	Preferred stock dividends (Net income attributable to non-controlling interests)	8.8	Continuous
Total amount of the impact of special factors on full year results		138.7	

*PMI expenses: expenses related to merger processes such as management and operation to maximize the effect of integration after merger.

Special factors (impact on full year results)

(Unit: Billions of Yen)

Temporary expenses incurred in this year		Total	101.3
Petrochemical	Negative influence of the difference between the receipts and disbursements of raw materials, reflecting the sharp decline in naphtha prices, time-lag factor		8.5
Influence of COVID-19	Chemicals segment		3.0
	Electronics segment		1.5
	Aluminum segment		2.0
	Showa Denko Materials segment		13.0
	Other		0.5
		Subtotal	20.0
Graphite Electrodes	Slowdown in global steel production		26.0
	Devaluation of inventory in accordance with the “lower of cost or market” accounting method		10.7
Influence of the integration with Hitachi Chemical Co., Ltd.	Advisory fee, attorney’s fee, etc. (Operating expenses)		3.5
	Adjustment of cost of sales on a consolidated basis due to market valuation of inventories on consolidation (Operating expenses)		11.8
	Expenses related to fund-raising, registration tax, etc. (Non-operating expenses)		16.1
		Subtotal	31.4
Extraordinary loss	Closure of Meitingen Plant, Germany, in the graphite electrode business		4.7
Continuous expenses		Total	37.4
Influence of the integration with Hitachi Chemical Co., Ltd.	Post-merger integration (PMI) expenses* ¹ (Operating expenses)		4.6
	Amortization of goodwill, etc. (second half) (Operating expenses)		18.7
	Interest on borrowing related to share acquisition, etc.* ² (Non-operating expenses)		5.3
	Preferred stock dividends* ³ (Net income attributable to non-controlling interests)		8.8
Total amount of the impact of special factors on full year results			138.7

*1 PMI expenses: expenses related to merger processes such as management and operation to maximize the effect of integration after merger.

*2 On and after the day we borrowed money. Recognized in 2020. *3 On and after the day HC Holdings issued preferred stocks. Recognized in 2020.

Consolidated Sales and Operating Income by Segment, 2020 Forecast (1)

(Unit: Billions of Yen)

		2019 Actual	2020 Revised Forecast*	Increase/ decrease	2020	
					1H	2H
Petrochemicals	Sales	250.7	186.0	-64.7	95.7	90.3
	Operating income	17.2	1.0	-16.2	-3.7	4.7
Chemicals	Sales	157.5	155.0	-2.5	72.0	83.0
	Operating income	13.7	13.0	-0.7	5.0	8.0
Electronics	Sales	96.4	100.0	3.6	44.6	55.4
	Operating income	4.9	9.0	4.1	1.8	7.2
Inorganics	Sales	230.1	91.0	-139.1	43.0	48.0
	Operating income	89.3	-23.0	-112.3	-22.9	0

* 2020 revised forecast was announced on Aug. 12, 2020.

Consolidated Sales and Operating Income by Segment, 2020 Forecast (2)

(Unit: Billions of Yen)

		2019 Actual	2020 Revised Forecast*	Increase/ decrease	2020	
					1H	2H
Aluminum	Sales	97.5	85.0	-12.5	38.8	46.2
	Operating income	1.7	1.5	-0.2	-0.2	1.7
Showa Denko Materials**	Sales	—	280.0	280.0	—	280.0
	Operating income	—	-20.0	-20.0	—	-20.0
Others	Sales	126.2	109.0	-17.2	55.6	53.4
	Operating income	1.8	1.0	-0.8	0.5	0.5
Adjustments	Sales	-52.0	-46.0	6.0	-23.2	-22.8
	Operating income	-7.8	-12.5	-4.7	-6.3	-6.2
Total	Sales	906.5	960.0	53.5	326.6	633.4
	Operating income	120.8	-30.0	-150.8	-25.8	-4.2

* 2020 revised forecast was announced on Aug. 12, 2020.

**Hitachi Chemical Company, Ltd.'s financial results for the second half of 2020 (July 1 to December 31, 2020) is consolidated as "Showa Denko Materials" segment. This segment includes amount of adjustment of cost of sales on a consolidated basis due to market valuation of inventories on consolidation (-11.8 billion yen) and amortization for goodwill, etc. for second half (-18.7 billion yen).

Consolidated Cash Flows, 2020 Forecast

(Unit: Billions of Yen)

	1H, 2020 Actual	2H, 2020 Forecast	2020 Forecast*
● CF from operating activities	5.2	59.8	65.0
● CF from investing activities	-792.6	-157.4 [*]	-950.0
● Free CF	-787.4	-97.6	-885.0
● CF from financing activities	864.7	105.3 [*]	970.0
● Others	-1.6	-3.4	-5.0
Increase/decrease of cash and equivalents	75.8	4.2	80.0

* We expect cash inflow (CF from financing activities) and outflow (CF from investing activities) of about 120 billion yen to cover the cost of acquisition of shares in Hitachi Chemical held by investors who were not subject to the TOB or did not applied for the TOB.

Capital expenditures/Depreciation Forecast by Segment for 2020

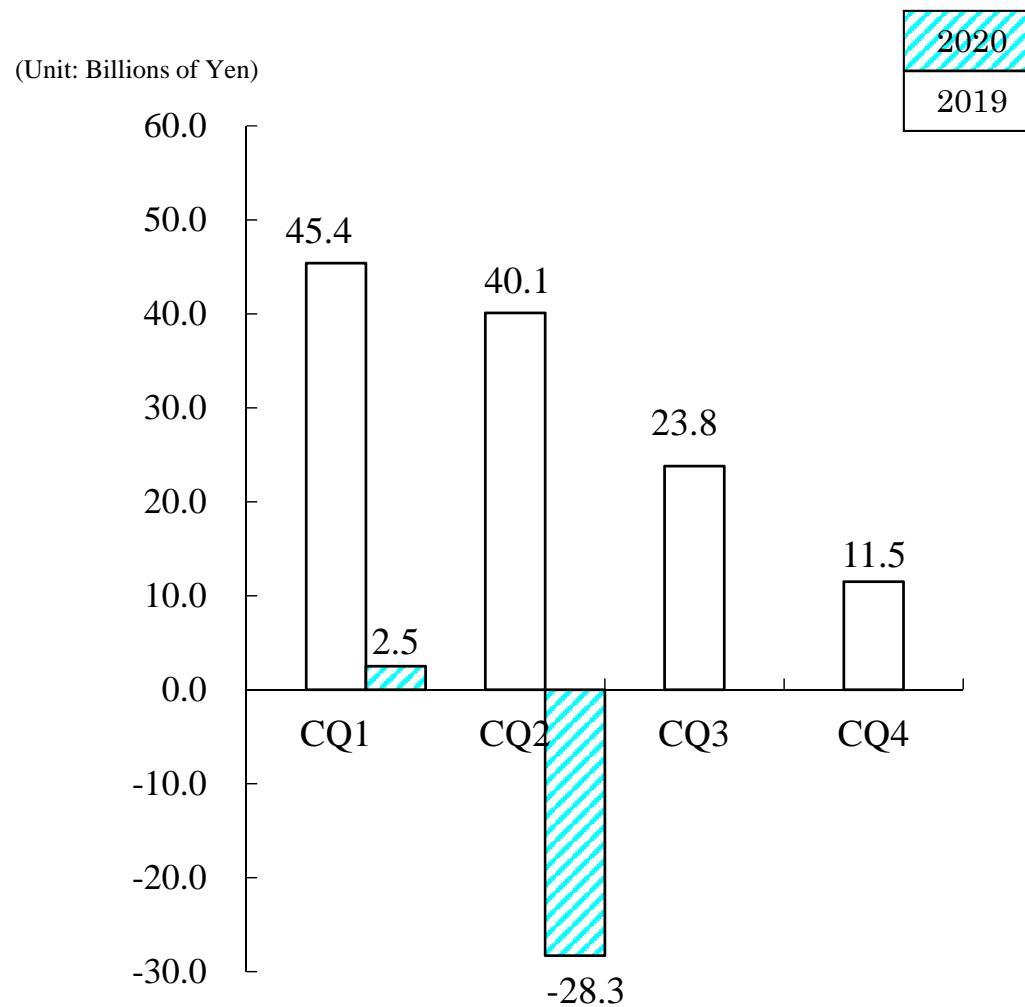
(Unit: Billions of Yen)

	2019 Actual		2020 Revised Forecast*		Increase/decrease	
	Capital expenditures	Depreciation	Capital expenditures	Depreciation	Capital expenditures	Depreciation
Petrochemicals	4.4	4.1	5.9	4.3	1.5	0.2
Chemicals	11.4	9.3	11.0	9.4	-0.5	0.1
Electronics	10.1	9.3	10.4	9.2	0.2	-0
Inorganics	11.7	8.0	8.2	8.0	-3.5	-0.1
Aluminum	8.5	4.8	8.9	4.6	0.5	-0.2
Showa Denko Materials**	—	—	19.1	22.5	19.1	22.5
Others	4.1	2.1	3.0	3.1	-1.2	0.9
Total	50.2	37.7	66.4	61.1	16.2	23.4

* 2020 revised forecast was announced on Aug. 12, 2020.

** Hitachi Chemical Company, Ltd.'s financial results for the second half of 2020 (July 1 to December 31, 2020) is consolidated as "Showa Denko Materials" segment.

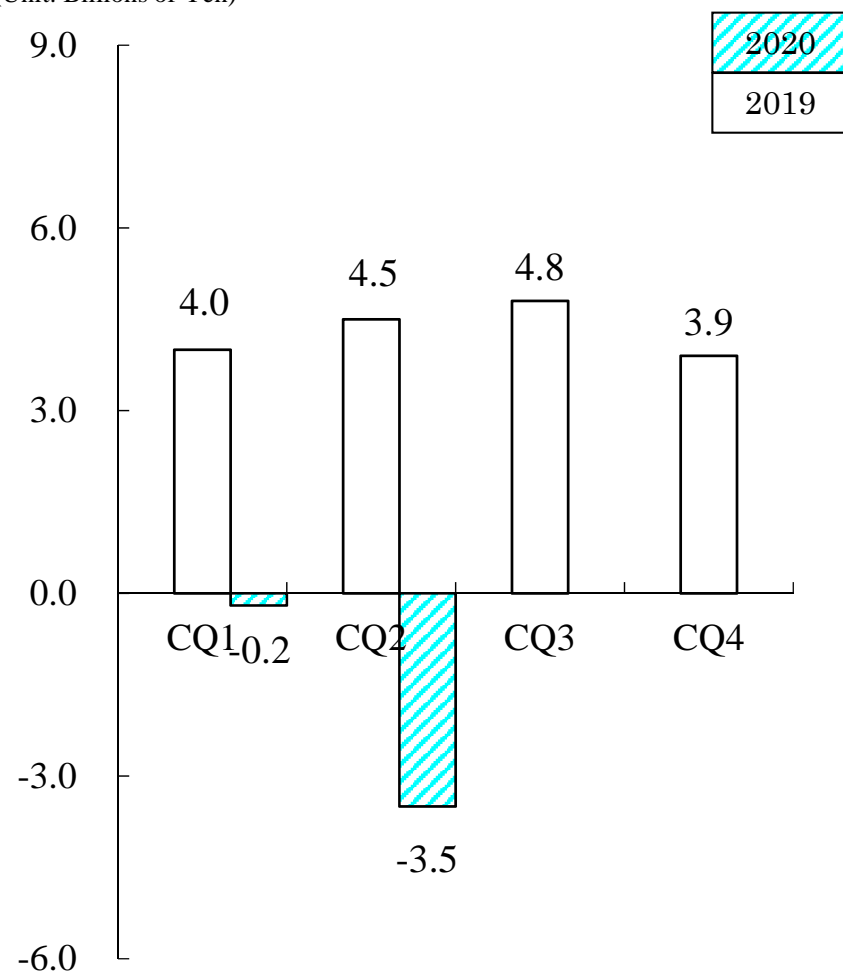
(Reference) Quarterly Operating Income



(Reference) Quarterly Operating Income by Segment

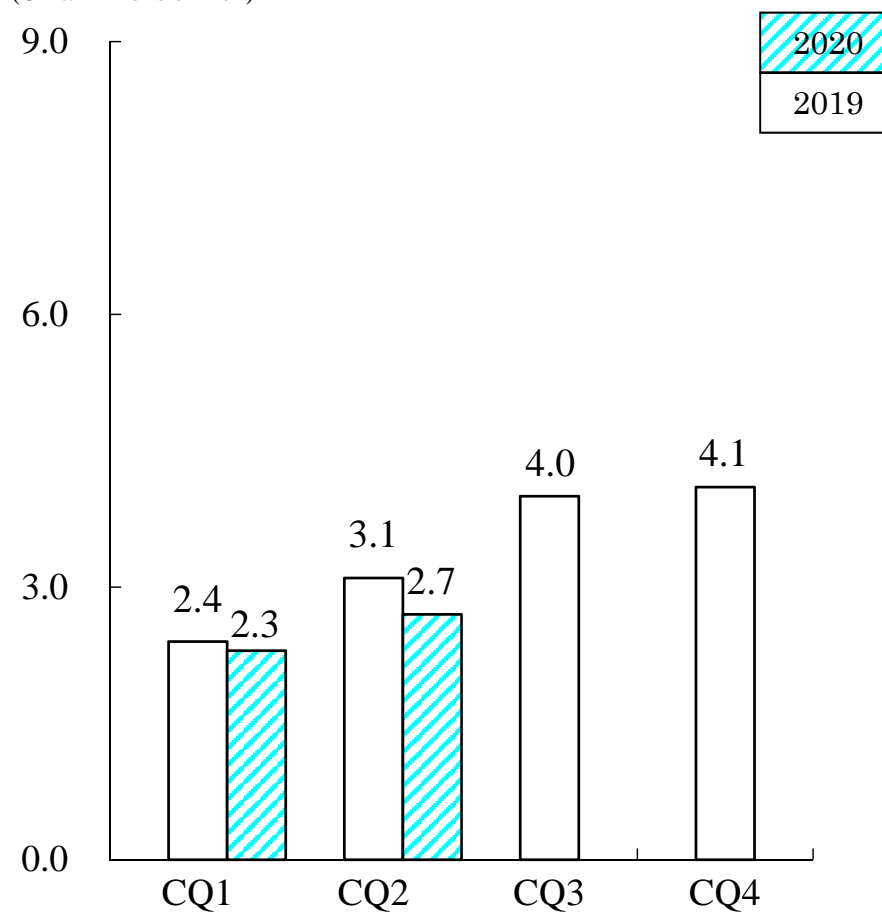
《Petrochemicals》

(Unit: Billions of Yen)



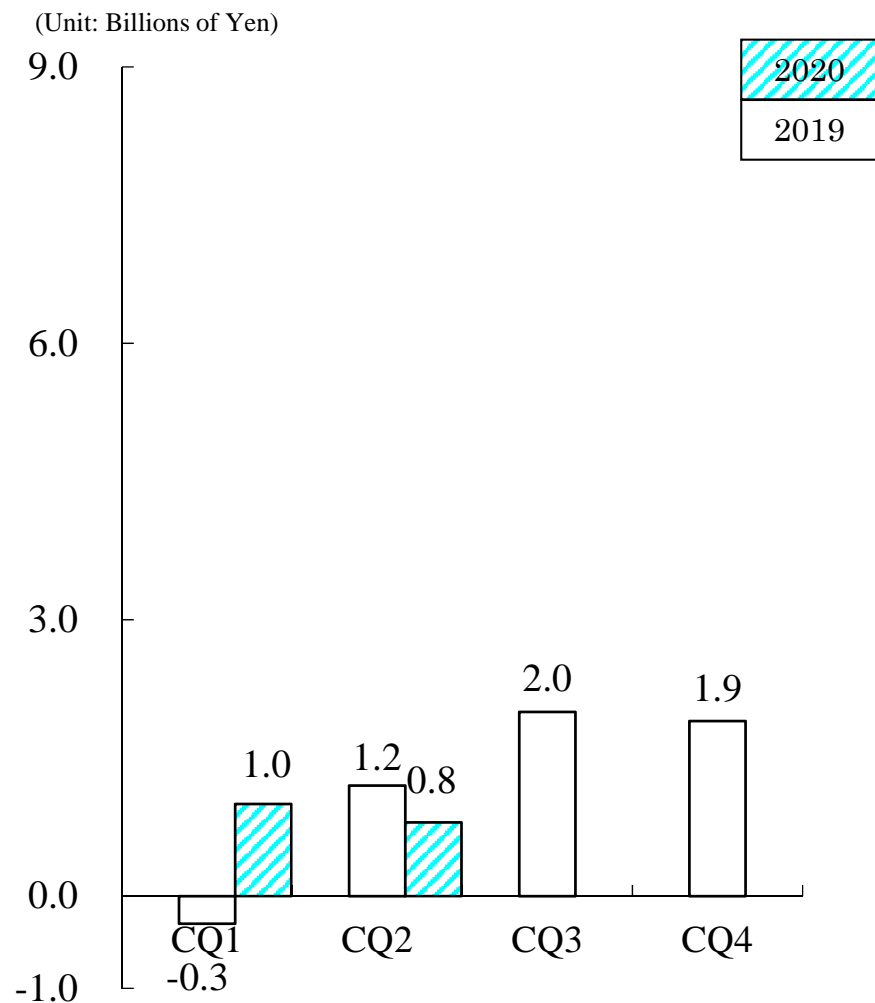
《Chemicals》

(Unit: Billions of Yen)

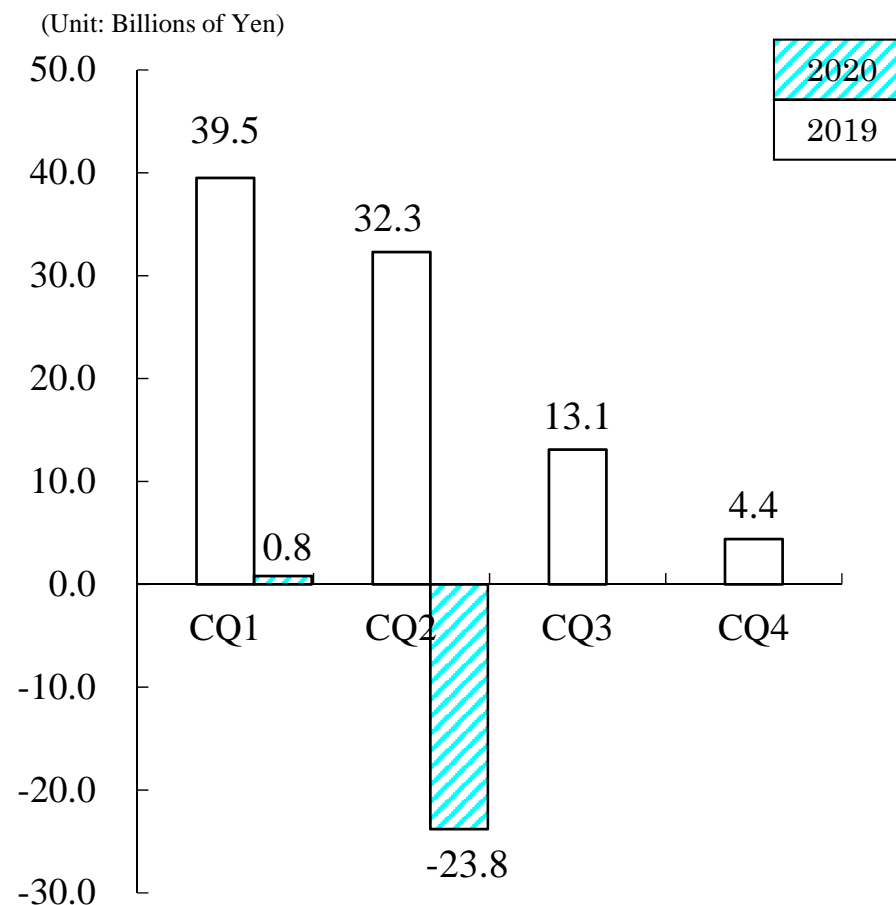


(Reference) Quarterly Operating Income by Segment

《Electronics》



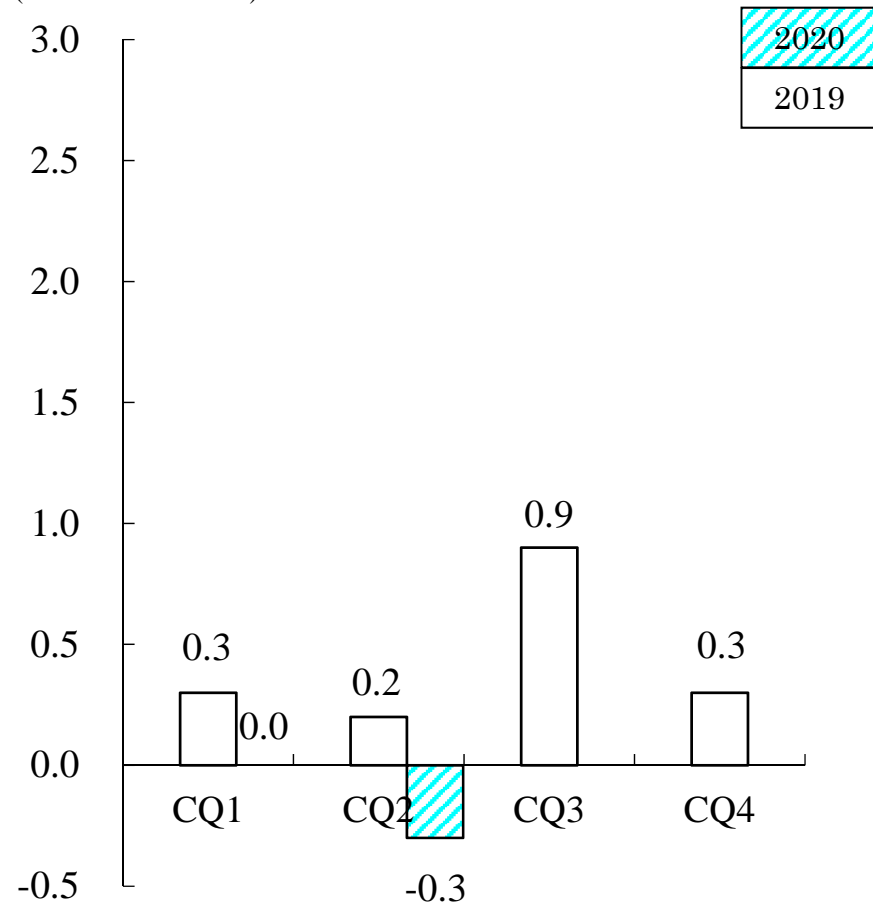
《Inorganics》



(Reference) Quarterly Operating Income by Segment

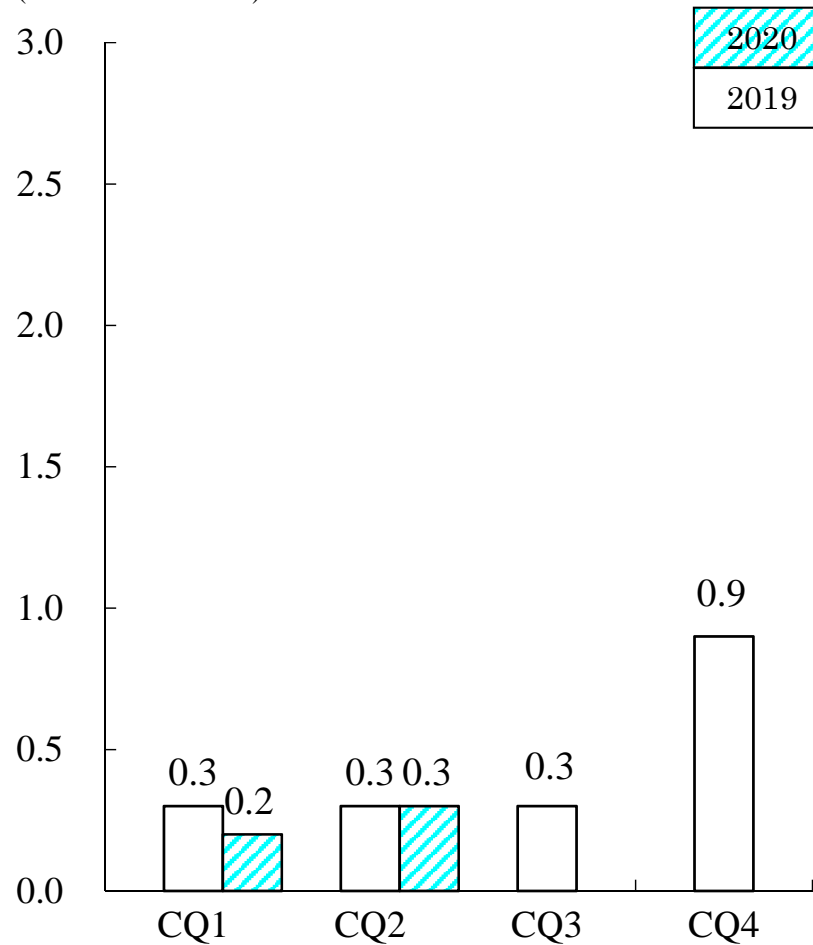
《Aluminum》

(Unit: Billions of Yen)



《Others》

(Unit: Billions of Yen)



Topics

[General]

- Announcement regarding results of tender offer for shares in Hitachi Chemical Company, Ltd. and change in subsidiary
- Announcement regarding fundraising, capital reduction of the consolidated subsidiary and change in the specified subsidiary company

For details, please refer to our news releases announced on April 21, 2020.

- As SDK's consolidated subsidiary, Hitachi Chemical changes firm name
Hitachi Chemical Company, Ltd., a consolidated subsidiary of SDK, has resolved at the annual general shareholders' meeting held on June 23, 2020 to change its firm name into "Showa Denko Materials Co., Ltd." on October 1, 2020. The new firm name represents Hitachi Chemical's determination of opening its new chapter as a consolidated subsidiary of SDK, and now SDK and Hitachi Chemical share the idea of offering their customers and society optimum solutions by combining Showa Denko Group's wide-ranging material technology with Hitachi Chemical Group's material design technology utilizing characteristics of raw materials, ability to evaluate functions, and ability to design functions leading to process technology, including module segmentation.

Topics

[General]

● Received award for used-plastic chemical recycling business

SDK received an award from Chairman of the Japan Business Federation for its used-plastic chemical recycling business. This award is part of Fujisankei Communications Group's 29th Grand Prize for the Global environment Award*. SDK has been conducting the used-plastic chemical recycling business since 2003. At its Kawasaki Plant, used plastic collected from home is gasified by thermal decomposition to generate hydrogen and carbon monoxide. Carbon monoxide from this process is used for production of carbonic acid products. Hydrogen is used as raw material for ammonia production, in fuel-cell vehicles, and for power generation at a hotel using fuel cells. Thus this business is contributing toward promotion of a low-carbon society. While reducing CO₂ emissions by avoiding incineration of used plastic, the business promotes resource recycling on land and reduces marine pollution by plastic. In addition to this chemical recycling, the Showa Denko Group is conducting various environment-friendly businesses. They include the global supply of graphite electrodes for recycling of iron, and production of aluminum cans based on used aluminum cans (can-to-can recycling). The group was the first company in Japan to start an aluminum can recycling project.

*This award was established in 1992 by Fujisankei Communications Group with special contribution from World Wide Fund for Nature (WWF) Japan. The award aims at encouraging the development of new technologies and products that will prevent global warming and promote a recycling-oriented society. It also aims at promoting environmental protection measures and enhancing global environment awareness. The award is granted to corporations recognized as having accomplished distinguished achievements in these areas.

Topics

[General]

● Introduced AI system to examine capital investment

SDK introduced an artificial-intelligence-based search system to look efficiently for information useful for capital investment evaluation from the company's knowledge databases. This new search engine uses an AI system named "KIBIT*" and searches the company's document database for knowledge useful for its internal examination and screening of investment plans. SDK started operation of the new system at the end of January 2020. KIBIT is an AI which simulates "tacit knowledge" held by experts and skilled workers. In order to search databases for cases appropriate to refer, this AI looks up not only key words but also structure of writing and the line of thought in documents on databases, including those in documents contained in attached files. This system enables us to extract cases of investment similar to newly suggested investment plans under screening not reliant on examiners' experiences. In a trial run of the new system conducted in SDK, we confirmed that the KIBIT-based system searched our document databases for similar cases of investment and judged degree of similarity within almost one tenth of the time needed by conventional search systems. In addition, the KIBIT-based system enables us to pick up many similar cases simultaneously, and make the most of our knowledge and know-how about facility-safety measures. SDK will put this new search system into regular use in its process to judge appropriateness of capital investment plans, and consider to extend the use of the news search system to cover search for similar cases of accidents and abnormalities in production fields.

*KIBIT: An artificial intelligence originally developed by FRONTEO, Inc. This AI is equipped with FRONTEO's original mechanical learning algorithm and powerful natural-language processing technology. It can learn deeply from small amount of teaching data, and conduct high precision analysis of database in a short time.

Topics

[General]

● Developed AI-based image analysis system to improve spherical alumina production

SDK developed an artificial-intelligence-based image analysis system for spherical alumina production in cooperation with BLUE TAG. SDK started using the system at its production line in the first half of 2020. SDK's spherical alumina product has the advantage of uniformity in sphericity and stability in product quality. Due to high fluidity and compatibility, it is used as filler for heatsinks for electronic components and as abrasive. The AI-based image analysis system we developed this time utilizes BLUE TAG's high technology of micro-level-image processing in the process to learn examples of skilled operator's judgement as training data. Thus the new system is aimed at visualizing experience-based knowledge of skilled operators and ensuring quick feedback of digitalized data to the production process to stabilize product quality. This was not possible under the conventional image-analysis software. As a result of initial tests, we confirmed the system's ability to make a judgement at the same level as that of skilled operators in about 20 seconds. In addition, this system also enables accumulation of data for relearning process, and inspection accuracy under the system can be improved based on operation results at the production line. Fully utilizing the new AI-based image analysis system, we will work to further improve product quality and productivity.

[General]

● Oita Complex received Best Safety Award from Japan Chemical Industry Association

In May 2020, SDK's Oita Complex received the Best Safety Award from Japan Chemical Industry Association (JCIA) in a program to commend chemical companies' safety activities. This is an award to commend model business facilities which perform excellent safety activities, aiming to promote voluntary safety/security activities in the chemical industry. Oita Complex's receiving the award brought SDK an honor to receive the award for two consecutive years, following the one awarded to Oyama Plant in 2019. In addition, this was the second time for Oita Complex to receive the award, following the first one in 2010. Oita Complex put "Give top priority to safety, aiming to achieve operation without any accidents or disasters" into the first line of its management policy. All employees and members of cooperative companies promote safety activities, equipment maintenance activities, educational programs and health care programs including "Oita Complex production system reform activities." Oita Complex continues operation without any accidents and disasters for a total of 6,250,000 hours, or 6 years. Cooperative companies continue operation without any absence from the workplace because of work-related injury for more than 10 years. This time, one of the reason Oita Complex received the award was the establishment of safety culture among SDK, other companies that constitute the Complex, and cooperative companies. Operation without any accidents and disasters was made possible through implementation of "Do all the common tasks properly" policy based on every employee's sense of responsibility. The Showa Denko Group as a body will nourish safety culture further, and enrich safety activities.

[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. In addition, since the market for semiconductor chips in Taiwan is also expected to expand, SDK's subsidiary "Taiwan Showa Chemicals Manufacturing Co., Ltd." has established a new facility to produce high-purity C_4F_8 with annual production capacity of 150t, and started operation in May 2020.

[Chemicals segment]

- Completed expansion of lines to produce vinyl ester resin and synthetic resin emulsion in Shanghai

In June 2020, SDK expanded production lines to produce vinyl ester resin (VE) and synthetic resin emulsion (EM) in the premises of Shanghai Showa Highpolymer Co., Ltd. (SSHP), a Chinese subsidiary of SDK, and has increased production of VE and EM there, aiming to expand the Showa Denko Group's functional resin business in China. The market for electronic parts such as liquid crystal displays (LCDs) and touch panels has been expanding due to the progress in telecommunication technologies including 5th Generation mobile communication system. As a result, the demand for VE, which is used in the process to produce electronic parts including LCDs and touch panels, has been rapidly increasing in China. In addition, since VE has excellent corrosion resistance and chemical resistance, the demand for VE for use as corrosion-resistant inner lining material has also been increasing. This use includes inner lining for desulfurization equipment increasingly introduced to thermal power plants to prevent air pollution, wastewater treatment equipment for electronic parts factories, garbage plants and storage tanks for chemicals. In China, regulation against volatile organic compound (VOC) as an environmental protection policy started in 2015, and, since then, there has been strict regulation for use of paints and adhesives containing organic solvents. As a result, switching over to aqueous paints and aqueous adhesives utilizing EM has been in progress, and therefore the demand for EM has been increasing.

[Electronics segment]

● Developed HAMR-technology-based HD media

SDK developed the technology of manufacturing media for next-generation hard disk drives (HDDs) based on the Heat Assisted Magnetic Recording (HAMR*) technology. Due to the rapid expansion of cloud service, video content, and image-sharing website, the world's data generation volume is growing rapidly. Thus, data centers need HDDs with larger storage capacity. While HD media record information through the polarity of magnetic particles, the speed of improving recording density has slowed down under conventional magnetic recording methods. As a result, there is a need for new recording methods, including HAMR. Also, there is a need for next-generation HD media corresponding to such new recording methods. To contribute toward commercialization of HAMR-based HDDs, SDK has successfully manufactured a new type of HD media. The new product has magnetic coercivity several times as high as the existing most-advanced HD media, while achieving low noise due to very small crystal grain size and optimized grain size distribution control. The new product embodies the highest levels in the industry in terms of read-write characteristics and durability. HD media are key parts for HDDs to determine their storage capacities. As the largest independent HD media supplier, SDK aims to quickly launch top-quality media based on innovative technologies. In accordance with its motto of "Best in Class," SDK will continue contributing to the increases in storage capacities of HDDs.

*HAMR represents a recording method in which magnetic film is locally heated at the time of recording. This technology has been developed to solve the "magnetic recording trilemma": difficulty in simultaneously meeting the three requirements of fine-particle structure, resistance to thermal fluctuation, and ease of magnetization. Compared with the recording density of approx. 1.14 Tb/in² for HD media based on conventional magnetic recording methods, it is said that HAMR-based HD media will achieve recording density of 5-6 Tb/in² in the future. Provided that the same number of disks are used, it is estimated that a 3.5-inch HDD will achieve storage capacity of approx. 70-80 TB per unit.

[Electronics segment]

- Decided to install equipment to mass-produce *SPALF*TM packaging material for large onboard LIBs

Showa Denko Packaging Co., Ltd. (SPA), a consolidated subsidiary of SDK, has developed a new product to be added to the lineup of *SPALF*TM aluminum laminate film which is used as packaging material for pouch-type lithium-ion batteries (LIBs), and decided to install equipment to mass-produce the new product. This new product is specialized for large-sized LIBs, which are mainly used for cars. Operation of the new production equipment is scheduled to be started in March, 2021. *SPALF*TM is laminated composite film consisting of resin films and aluminum foil, and is mainly used as packaging material for pouch-type LIBs. Pouch-type LIBs have outstanding flexibility in shaping. In recent years, pouch-type LIBs have begun to be widely used in large-sized equipment including EVs because pouch-type LIBs' high quality has been widely recognized and there has been considerable progress in verification of pouch-type LIBs' safety. Since development of EVs is in progress not only in China but also in Europe, the demand for pouch-type LIBs has been increasing. The global demand for LIBs (in electrical capacitance) is expected to increase 30% a year until 2025*. The Showa Denko Group produces and sells various LIB materials with distinguishing advantages, such as *SPALF*TM, *VGCF*TM additives for anode/cathode materials, and *POLYSOL*TM aqueous binding resin. By increasing sales of these LIB materials, the Group will aim to contribute to the growth of LIB market and improvement in functions of LIBs, and make the Group's LIB materials business grow to be established as a KOSEIHA Business in the field of advanced battery materials.

*SDK's estimate

[Inorganics segment]

● About closing of a graphite electrode production site in Germany

In June 2020, the Showa Denko Group completed labor-management consultations concerning planned closure of a production site in Meitingen, Germany, under the jurisdiction of consolidated subsidiaries SHOWA DENKO CARBON Products Germany GmbH & Co. KG and SHOWA DENKO CARBON Germany GmbH. The Meitingen site is currently producing connecting pins* for graphite electrodes. When the site is closed, the Showa Denko Group's connecting pin production will be concentrated at Omachi Plant in Japan. When production at Meitingen is stopped, the Showa Denko Group's global graphite electrode production capacity will decrease by 40,000 t/y, to 210,000 t/y. The Group has the leading share in the global ultrahigh power (UHP) graphite electrode market. However, electric steelmakers are continuing to adjust their inventory of graphite electrodes since the second half of 2019. Thus, our operating rates have fallen in the European market, where economic slowdown is noticeable. In addition, we have started temporary idling for a limited period at SHOWA DENKO CARBON Austria GmbH's Steeg site. These two actions will result in a rebalancing of capacity in Europe in line with projected graphite electrode demand. SDK will continue taking various measures to achieve "Value in Use No. 1" for customers and to further increase competitiveness and profitability.

*A connecting pin is used for connecting rods of graphite electrodes.