Evolving unique chemical company

Second Quarter, 2015 Financial Results

- Consolidated -

SHOWA DENKO K.K.

July 30, 2015

Saburo Muto, CFO
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 economic conditions, costs of naphtha and other raw materials, demand for our products, market conditions, and foreign exchange rates. We undertake no obligation to update the forward-looking statements unless required by law.

Consolidated Companies

- Consolidated subsidiaries: 48
  - 4 companies newly consolidated
    - Shanghai Showa Electronics Materials Co., Ltd.
    - Showa Specialty Gas Singapore Pte. Ltd.
    - Shanghai Showa Highpolymer Co., Ltd.
    - SHOTIC MALAYSIA SDN. BHD.
  - 1 company excluded
    - Shotan Shoji Kaisha Ltd.
- Equity method applied: 13
  - 1 company newly applied
    - PT. Indonesia Chemical Alumina

Selected Data

(Average figure)

	Jan.- Jun. 2014	Jan.- Jun. 2015	Increase/ decrease
■Exchange rate:¥/US$	102.5	120.2	Yen depreciated by 17.8
■Domestic naphtha price: ¥/kl	70,950	47,800	-23,150
■Aluminum			
LME price: US$/T	1,794	1,802	8
Domestic market*: K¥/T	252	303	51

Exchange rate at 2014 year-end: ¥120.6/US$, at the end of June, 2015 ¥ 122.5 /US$
⇒Yen depreciated by ¥1.9/US$

*Domestic market: data from Nikkei

Summary

2014 (Jan.1 – Jun.30) vs. 2015 (Jan.1 – Jun.30)

(Unit: Billions of Yen)

	Jan.-Jun. 2014	Jan.-Jun. 2015	Increase/ decrease
Net Sales	413.4	397.0	-16.4
Operating Income	10.5	16.1	5.6
Non-operating income and expense	-3.3	-0.6	2.7
Interest/Dividend income less expenses	-1.0	-0.8	0.2
Equity in earnings or losses of affiliates	0.4	1.1	0.7
Foreign exchange gain or loss	-0.9	-1.0	-0.1
Other	-1.9	0.1	2.0
Ordinary Income	7.2	15.5	8.3
Extraordinary Income	1.1	1.9	0.8
Extraordinary Loss	-5.8	-17.5	-11.7
Income before income taxes and minority interests	2.5	-0.1	-2.6
Income Taxes	-5.4	-5.3	0.2
Minority Interests in income	-0.5	6.6	7.1
Net Income	-3.4	1.3	4.7

Extraordinary Profit/Loss

(Unit: Billions of Yen)

	Jan.-Jun. 2014	Jan.-Jun. 2015	Increase/ decrease
■Extraordinary Profit	1.1	1.9	0.8
●Gain from sales of fixed assets	0.0	0.1	0.1
●Gain on sales of investment securities	0.7	1.7	1.0
●Other	0.4	0.1	-0.2
■Extraordinary Loss	-5.8	-17.5	-11.7
●Loss on sales and retirement of noncurrent assets	-0.7	-1.4	-0.7
●Loss on valuation of investment securities	-4.0	0.0	4.0
●Provision of allowance for doubtful accounts	-	-12.9	-12.9
●Other	-1.0	-3.2	-2.1
■Extraordinary Profit/Loss, Net	-4.7	-15.6	-10.9

Consolidated Sales by Segment

(Unit: Billions of Yen)

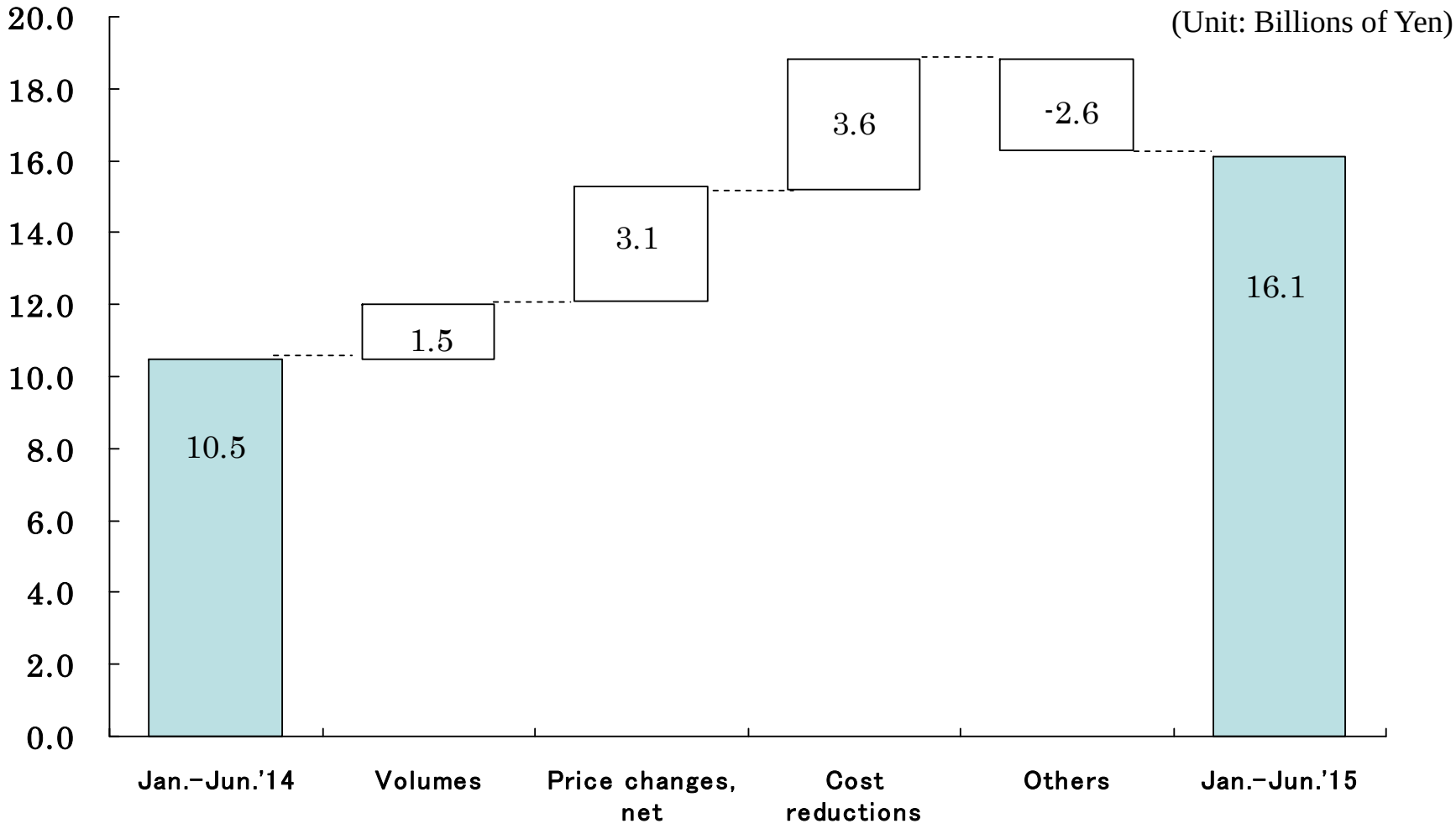
	Jan.-Jun. 2014	Jan.-Jun. 2015	Increase	
Petrochemicals	119.7	121.2	1.5	【Olefins】sales maintained at the year-earlier level (shipment volumes up as there was no shutdown maintenance in 2015; market price down) 【Organic chemicals】sales increased (shipment volumes of vinyl acetate and ethyl acetate up)
Chemicals	67.3	70.2	2.9	【Basic chemicals】sales decreased (Ammonia: shipment volumes down, AN: market price down) 【Electronic chemicals】sales increased (shipment volumes up) 【Functional chemicals】sales increased (Shanghai Showa Highpolymer Co., Ltd.: newly consolidated) 【Industrial gases】sales maintained at the year-earlier level
Electronics	69.5	65.0	-4.5	【HDs】sales decreased (shipment volumes down) 【Compound semiconductors】sales slightly decreased 【Rare earth】sales substantially decreased (shipment volumes down, market price down)
Inorganics	33.3	33.1	-0.3	【Ceramics】sales maintained at the year-earlier level 【Graphite electrodes】sales slightly decreased
Aluminum	45.8	50.0	4.2	【High-purity foil for capacitors】sales increased (shipment volumes of Showa Denko Aluminum (Nantong) Co., Ltd. up) 【Aluminum specialty components】sales decreased (shipment volumes down) 【Aluminum cans】sales increased (Hanacans Joint Stock Company: newly consolidated at the end of June, 2014)
Others	99.1	79.4	-19.7	【LIB materials】sales increased (shipment volumes up for smartphone and automotive applications) 【SHOKO Co., Ltd.】sales substantially decreased (Steel-related business in China)
Adjustment	-21.5	-22.0	-0.6	
Total	413.4	397.0	-16.4	

Consolidated Operating Income by Segment

(Unit: Billions of Yen)

	Jan.-Jun. 2014	Jan.-Jun. 2015	Increase	
Petrochemicals	-1.9	6.0	7.9	【Olefins】profit substantially increased (improved export margin; shipment volumes up as there was no shutdown maintenance in 2015) 【Organic chemicals】profit increased (shipment volumes up)
Chemicals	1.4	4.3	2.9	【Basic chemicals】profit increased (chloroprene rubber: export steady) 【Electronic chemicals】profit increased (shipment volumes up) 【Functional chemicals】Shanghai Showa Highpolymer Co., Ltd.: newly consolidated 【Industrial gases】profit increased 【Power generating business】profit increased
Electronics	13.2	8.0	-5.2	【HDs】profit decreased (shipment volumes down) 【Compound semiconductors】profit slightly increased 【Rare earth】profit decreased (shipment volumes down; reductions in the book value of inventories)
Inorganics	-0.8	0.0	0.7	【Ceramics】profit increased (shipment volumes up) 【Graphite electrodes】profit increased
Aluminum	1.8	1.4	-0.4	【High-purity foil for capacitors】profit slightly increased 【Aluminum specialty components】profit slightly increased 【Aluminum cans】profit decreased (metal costs up)
Others	0.3	0.2	-0.1	【LIB materials】profit increased (shipment volumes up) 【SHOKO Co., Ltd.】profit decreased
Adjustment	-3.5	-3.7	-0.2	
Total	10.5	16.1	5.6	

Operating Income Breakdown by Factor



Consolidated Balance Sheet

(Unit: Billions of Yen)

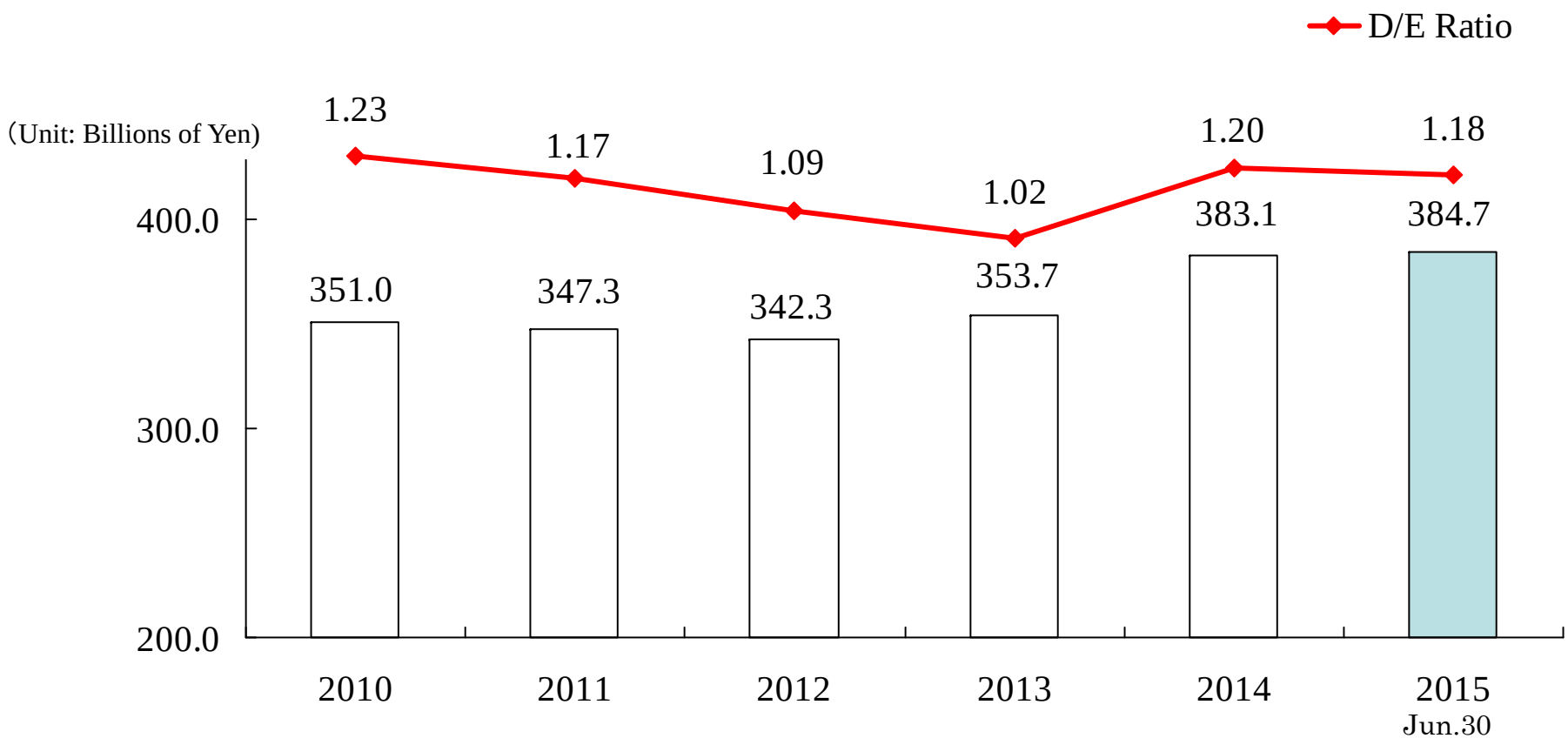
Assets	Dec.31, 2014	Jun.30, 2015	Increase/ decrease	Liabilities and Net Assets	Dec.31, 2014	Jun.30, 2015	Increase/ decrease
Cash and deposits	66.8	67.6	0.8	Notes and accounts payable	127.2	108.0	-19.2
Notes and accounts receivable	156.9	129.2	-27.7	Interest-bearing debt	383.1	384.7	1.6
Inventories	123.6	119.2	-4.4	Net defined benefit liability	22.1	14.4	-7.7
Other current assets	33.1	32.8	-0.3	Other liabilities	158.1	141.3	-16.8
Total Current Assets	380.4	348.8	-31.6	Total Liabilities	690.6	648.5	-42.1
Buildings and structures	85.9	86.3	0.4	Capital stock	140.6	140.6	0.0
Machinery and equipment	119.9	118.6	-1.4	Capital surplus	62.2	62.2	0.0
Land	254.1	254.1	0.0	Retained earnings	57.5	55.9	-1.6
Other tangible fixed assets	53.7	58.8	5.1	Treasury stock	-10.2	-10.2	0.0
Total Tangible Fixed Assets	513.7	517.8	4.2	Total Shareholders' equity	250.1	248.5	-1.6
Intangible Fixed Assets	13.7	13.1	-0.6	Valuation difference on available-for-sale securities	6.8	10.5	3.7
Investments and other assets	103.3	95.9	-7.4	Foreign currency translation adjustment, Deferred hedge gains	20.3	24.6	4.3
incl. investment securities	76.1	79.9	3.8	Revaluation reserve for land	27.9	31.5	3.6
				Remeasurements of defined benefit plans	-4.9	-2.0	2.9
				Total accumulated other comprehensive income	50.1	64.5	14.5
				Minority Interests	20.3	14.1	-6.2
Total fixed assets	630.6	626.8	-3.8	Total net assets	320.5	327.2	6.7
Total Assets	**1,011.1**	**975.6**	**-35.4**	**Total Liabilities and Net Assets**	**1,011.1**	**975.6**	**-35.4**

Total Assets
Interest-bearing Debt and D/E ratio

(Unit: Billions of Yen)

	Dec.31, 2014	Jun.30, 2015	Increase/ decrease
● **Total assets**	1,011.1	975.6	-35.4
● **Interest-bearing debt**	383.1	384.7	1.6
● **Debt/Equity ratio**	1.20times	1.18times	-0.02p
● **Stockholders' Equity ratio**	29.7%	32.1%	2.4p

Interest-bearing Debt



Equity ratio	26.1%	26.8 %	29.2%	30.6%	29.7%	32.1%

Consolidated Cash Flows

(Unit: Billions of Yen)

	2014 Jan.-Jun.	2015 Jan.-Jun.	Increase/ decrease
●CF from Operating Activities	11.3	21.3	10.0
●CF from Investing Activities	-30.6	-18.3	12.3
●Free CF	-19.3	3.1	22.4
●CF from Financing Activities	6.2	-7.6	-13.7
●Others	-1.5	2.1	3.5
Increase/decrease of cash and equivalents	-14.6	-2.5	12.1

Selected Data (Consolidated)

(Unit: Billions of Yen)

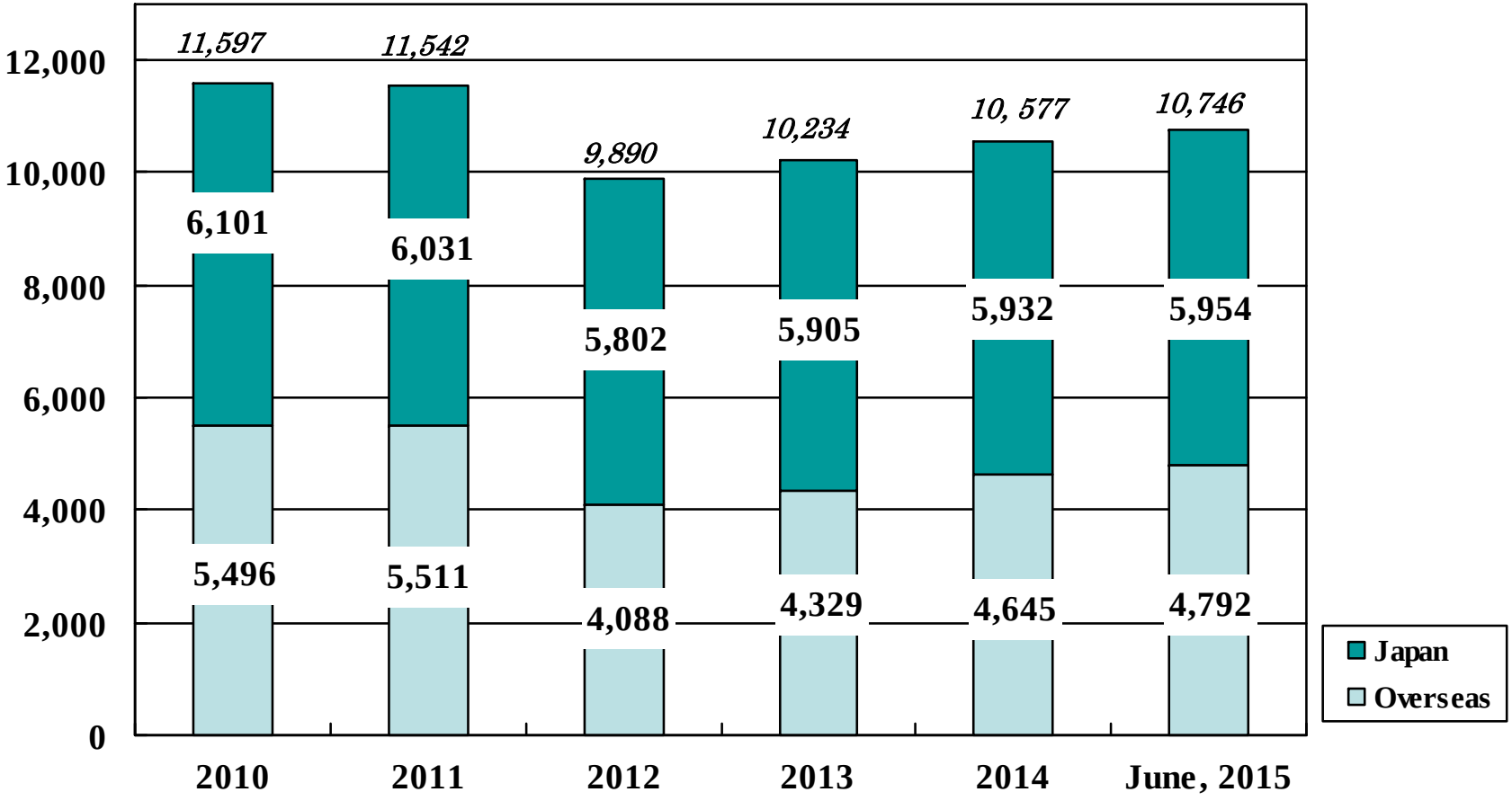
	Jan.-Jun. 2014	Jan.-Jun. 2015	Increase/ decrease
● Interest/dividend income less interest expenses	-1.0	-0.8	0.2
● Capital expenditures	25.1	20.3	-4.9
● Depreciation and amortization	19.7	21.0	1.3
● R&D expenditures	9.8	10.3	0.5
● Number of employees	10,458	10,746	288
● Total employment cost	36.5	37.0	0.5

Capital expenditures/ Depreciation by Segment

(Unit: Billions of Yen)

	Jan.-Jun. 2014		Jan.-Jun. 2015		Increase/decrease	
	Capital expenditures	Depreciation	Capital expenditures	Depreciation	Capital expenditures	Depreciation
Petrochemicals	3.5	3.2	1.2	3.0	-2.3	-0.2
Chemicals	3.9	3.8	5.3	3.8	1.4	0.1
Electronics	3.1	6.4	4.2	6.9	1.1	0.5
Inorganics	7.8	1.7	4.5	2.0	-3.3	0.3
Aluminum	4.0	2.4	2.4	3.0	-1.6	0.7
Others	2.9	2.3	2.7	2.3	-0.2	0.1
Total	25.1	19.7	20.3	21.0	-4.9	1.3

Total number of employees and breakdown by location



Japan	52.6%	52.3%	58.7%	57.7%	56.1%	55.4%
Overseas	47.4%	47.7%	41.3%	42.3%	43.9%	44.6%

2015 Forecast

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

	2014	2015 Revised Forecast*	Increase/ decrease	2015 Initial Forecast**	Increase/ decrease (against initial)
Net Sales	876.6	825.0	-51.6	900.0	-75.0
Operating Income	20.9	40.0	19.1	40.0	0.0
Non-operating income and expense	1.2	-3.0	-4.2	-5.5	2.5
Ordinary Income	22.1	37.0	14.9	34.5	2.5
Extraordinary Profit / Extraordinary Loss	-12.1	-24.0	-11.9	-9.0	-15.0
Net Income	3.5	10.0	6.5	15.0	-5.0
Net Income per Share	¥2.38	¥7.00	¥4.62	¥10.50	¥-3.50
Cash dividends per Share	¥3.00	¥3.00 (planned)	–	¥3.00 (planned)	–

* 2015 Revised forecast was announced on July 30, 2015.
**2015 Initial forecast was announced on Feb. 12, 2015.

Consolidated Net Sales by Segment, 2015 Forecast

(Unit: Billions of Yen)

	2014	2015 Revised Forecast*	Increase/ decrease	2015 Initial Forecast**	Increase/ decrease (against initial)
Petrochemicals	281.4	248.0	-33.4	262.0	-14.0
Chemicals	139.1	145.0	5.9	153.0	-8.0
Electronics	138.5	138.0	-0.5	149.0	-11.0
Inorganics	67.6	72.0	4.4	80.0	-8.0
Aluminum	98.0	105.0	7.0	111.0	-6.0
Others	195.0	162.0	-33.0	182.0	-20.0
Adjustment	-43.0	-45.0	-2.0	-37.0	-8.0
Total	876.6	825.0	-51.6	900.0	-75.0

* 2015 Revised forecast was announced on July 30, 2015.
**2015 Initial forecast was announced on Feb. 12, 2015.

Consolidated Operating Income by Segment, 2015 Forecast

(Unit: Billions of Yen)

	2014	2015 Revised Forecast*	Increase/ decrease	2015 Initial Forecast**	Increase/ decrease (against initial)
Petrochemicals	-4.9	13.0	17.9	7.0	6.0
Chemicals	5.5	10.5	5.0	9.5	1.0
Electronics	25.8	19.5	-6.3	24.0	-4.5
Inorganics	-0.3	1.5	1.8	4.0	-2.5
Aluminum	3.0	3.0	0.0	2.5	0.5
Others	-0.7	0.5	1.2	1.0	-0.5
Adjustment	-7.4	-8.0	-0.6	-8.0	0.0
Total	20.9	40.0	19.1	40.0	0.0

* 2015 Revised forecast was announced on July 30, 2015.
**2015 Initial forecast was announced on Feb. 12, 2015.

Selected Data, Forecast

(Unit: Billions of Yen)

	2014 Actual	2015 Revised Forecast*	Increase/ decrease
●Interest-bearing debt at year end	383.1	380.0	-3.1
●Interest/dividend income less interest expenses	-0.8	-2.4	-1.6
●R&D expenditures	20.4	20.9	0.6
●Number of employees	10,577	10,903	326
●Total employment cost	72.0	74.0	2.0
●Exchange rate: ¥/US$	1H 102.5 2H 109.2	1H 120.2 2H 120.0	1H 17.8 2H 10.8
●Domestic naphtha price: ¥/kl	1H 70,950 2H 68,450	1H 47,800 2H 50,900	1H -23,150 2H -17,550
●Aluminum LME price: US$/T	1H 1,794 2H 1,993	1H 1,802 2H 1,850	1H 8 2H -143

* 2015 Revised forecast was announced on July 30, 2015.

Capital expenditures/Depreciation Forecast by Segment for 2015

(Unit: Billions of Yen)

	2014 Actual		2015 Revised forecast*		Increase/decrease		2015 Initial forecast**	
	Capital expenditures	Depreciation	Capital expenditures	Depreciation	Capital expenditures	Depreciation	Capital expenditures	Depreciation
Petrochemicals	4.2	6.5	2.3	5.7	-1.9	-0.7	2.4	5.8
Chemicals	7.8	7.5	12.0	7.4	4.3	-0.1	11.5	7.2
Electronics	7.8	13.2	14.6	14.0	6.8	0.7	15.0	13.4
Inorganics	15.4	3.6	11.2	4.3	-4.2	0.7	10.6	5.5
Aluminum	7.1	5.3	5.2	6.0	-1.9	0.7	5.7	5.8
Others	5.0	4.6	6.0	5.0	1.0	0.4	5.9	4.9
Total	47.3	40.7	51.3	42.4	3.9	1.7	51.2	42.6

* 2015 Revised forecast was announced on July 30, 2015.
**2015 Initial forecast was announced on Feb. 12, 2015.

CQ2 Summary (Reference)

CQ1 (Jan.1 – Mar.31), 2015 v s. CQ2 (Apr.1 – Jun.30), 2015

(Unit: Billions of Yen)

	CQ1, 2015	CQ2, 2015	Increase/ decrease
Net Sales	193.2	203.8	10.6
Operating Income	3.9	12.3	8.4
Non-operating income and expense	-1.1	0.5	1.6
Interest/Dividend income less expenses	-0.7	0.0	0.7
Equity in earnings or losses of affiliates	0.5	0.5	0.0
Foreign exchange gain or loss	-0.9	-0.1	0.8
Other	0.0	0.1	0.1
Ordinary Income	2.8	12.7	10.0
Extraordinary Income	0.0	1.9	1.9
Extraordinary Loss	-15.2	-2.4	12.8
Income before income taxes and minority interests	-12.4	12.3	24.7
Income Taxes	-2.4	-2.9	-0.5
Minority Interests in income	7.2	-0.6	-7.8
Net Income	-7.5	8.8	16.3

Consolidated Sales by Segment

(Unit: Billions of Yen)

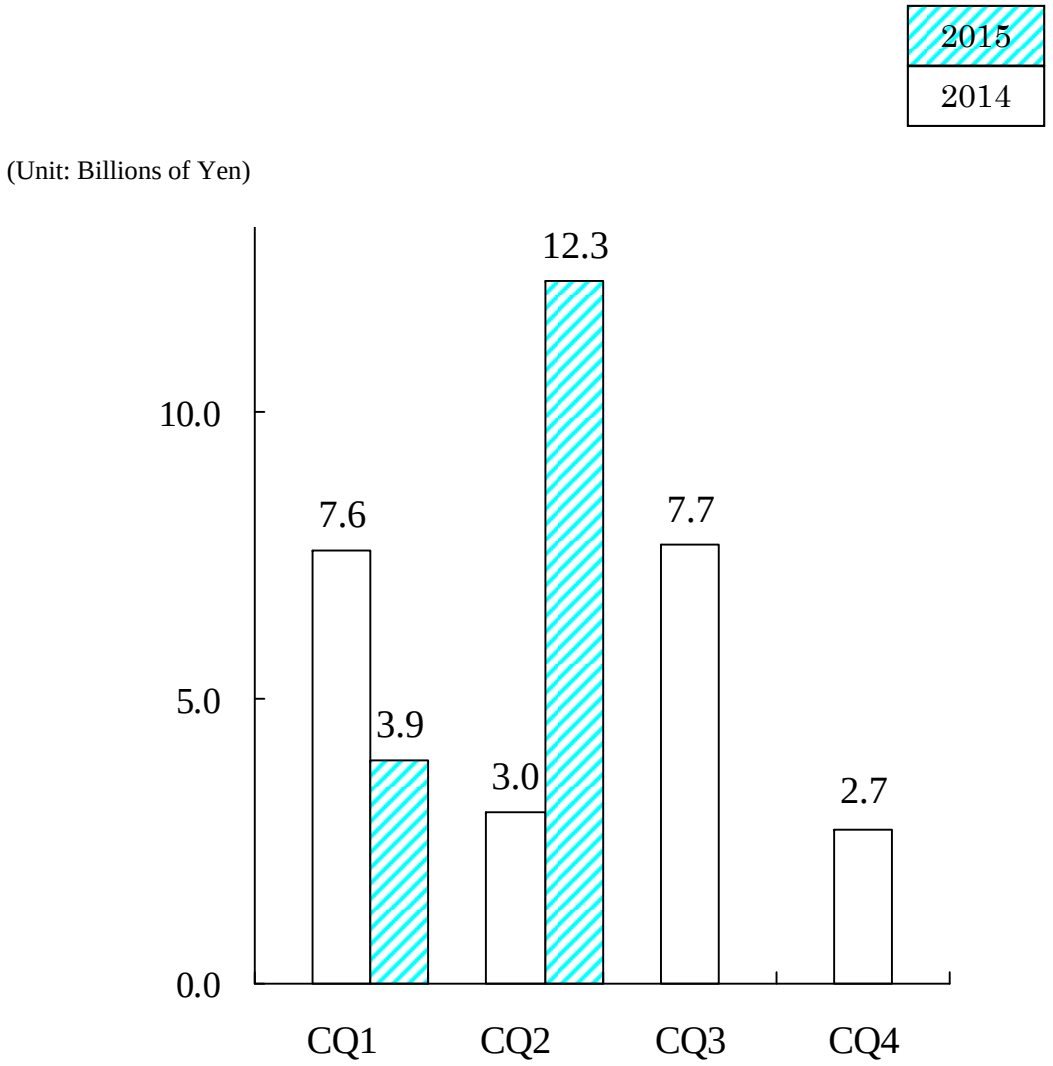
	CQ1, 2015	CQ2, 2015	Increase/ decrease	
Petrochemicals	57.1	64.1	7.0	【Olefins】sales increased (market price up) 【Organic chemicals】sales decreased
Chemicals	34.8	35.5	0.7	【Basic chemicals】sales increased (Chloroprene rubber: shipment volumes up) 【Electronic chemicals】sales increased (shipment volumes up) 【Functional chemicals】sales decreased (shipment volumes down) 【Industrial gases】sales increased (seasonal)
Electronics	33.0	32.0	-0.9	【HDs】sales decreased (shipment volumes down) 【Compound semiconductors】sales slightly increased 【Rare earth】sales maintained at the CQ1 level
Inorganics	15.7	17.4	1.7	【Ceramics】sales increased (shipment volumes up for electronic component applications) 【Graphite electrodes】sales increased (shipment volumes up)
Aluminum	23.1	26.9	3.9	【High-purity foil for capacitors】sales increased (shipment volumes up) 【Aluminum specialty components】sales maintained at the CQ1 level 【Aluminum cans】sales increased (seasonal)
Others	40.6	38.8	-1.8	【LIB materials】sales increased (shipment volumes up) 【SHOKO Co., Ltd.】sales decreased
Adjustment	-11.1	-11.0	0.1	
Total	193.2	203.8	10.6	

Consolidated Operating Income by Segment

(Unit: Billions of Yen)

	CQ1, 2015	CQ2, 2015	Increase/ decrease	
Petrochemicals	-1.7	7.7	9.4	【Olefins】profit substantially increased (improved export margin) 【Organic chemicals】profit increased
Chemicals	2.1	2.1	0.0	【Basic chemicals】profit slightly increased 【Electronic chemicals】profit increased (shipment volumes up) 【Functional chemicals】profit maintained at the CQ1 level 【Industrial gases】profit increased 【Power generating business】profit decreased (due to shutdown maintenance)
Electronics	5.4	2.6	-2.8	【HDs】profit decreased (shipment volumes down) 【Compound semiconductors】profit maintained at the CQ1 level 【Rare earth】profit decreased (reductions in the book value of inventories)
Inorganics	-0.3	0.3	0.5	【Ceramics】profit increased (shipment volumes up) 【Graphite electrodes】profit slightly increased
Aluminum	0.2	1.2	1.1	【High-purity foil for capacitors】profit maintained at the CQ1 level 【Aluminum specialty components】profit increased 【Aluminum cans】profit decreased
Others	0.1	0.1	0.1	【LIB materials】profit increased (shipment volumes up)
Adjustment	-1.9	-1.8	0.1	
Total	3.9	12.3	8.4	

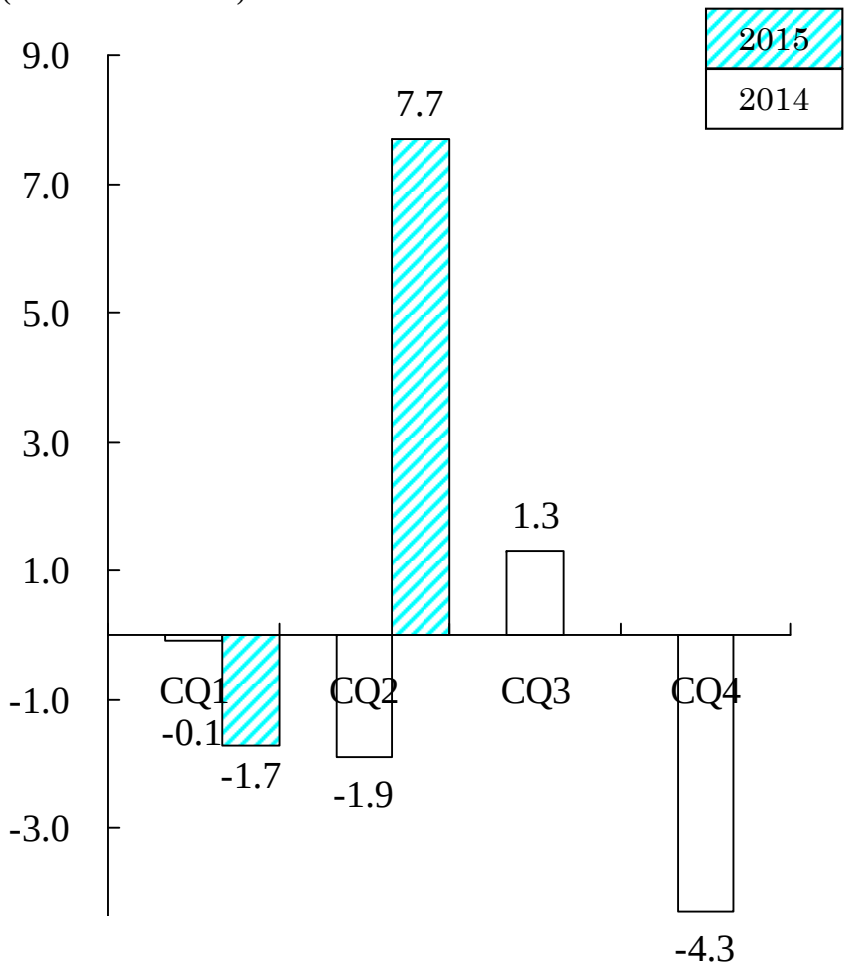
(Reference)　Quarterly Operating Income



(Reference) Quarterly Operating Income by Segment

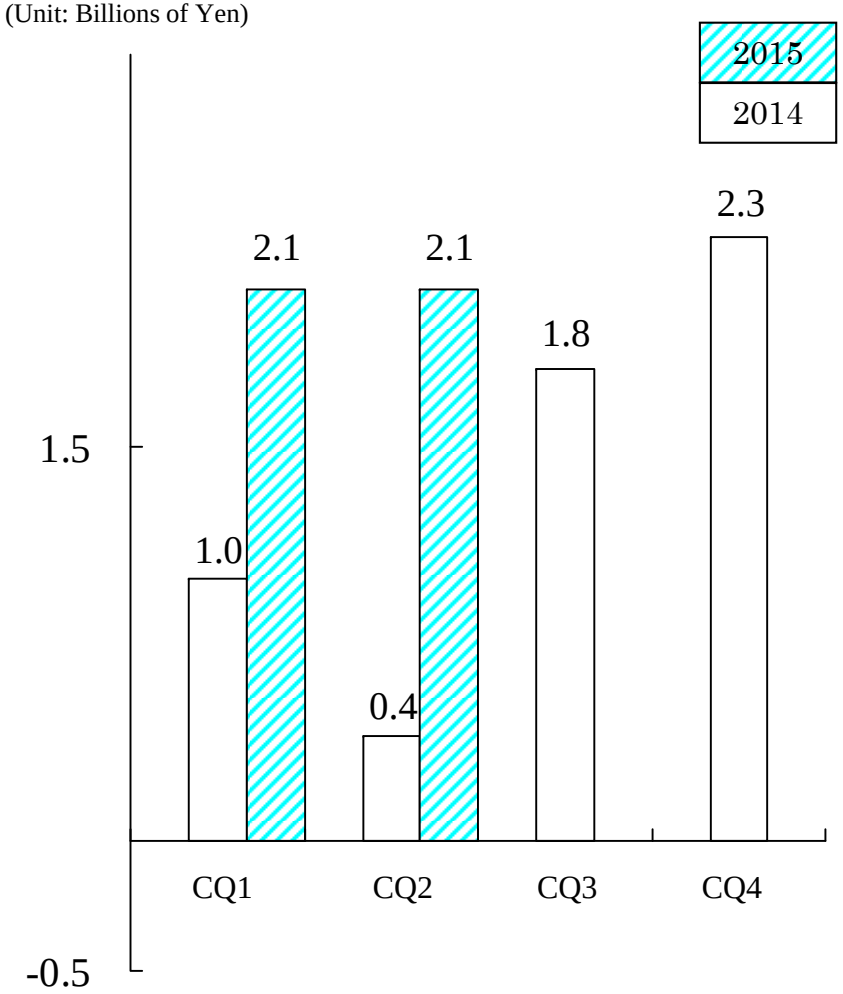
《Petrochemicals》

(Unit: Billions of Yen)



《Chemicals》

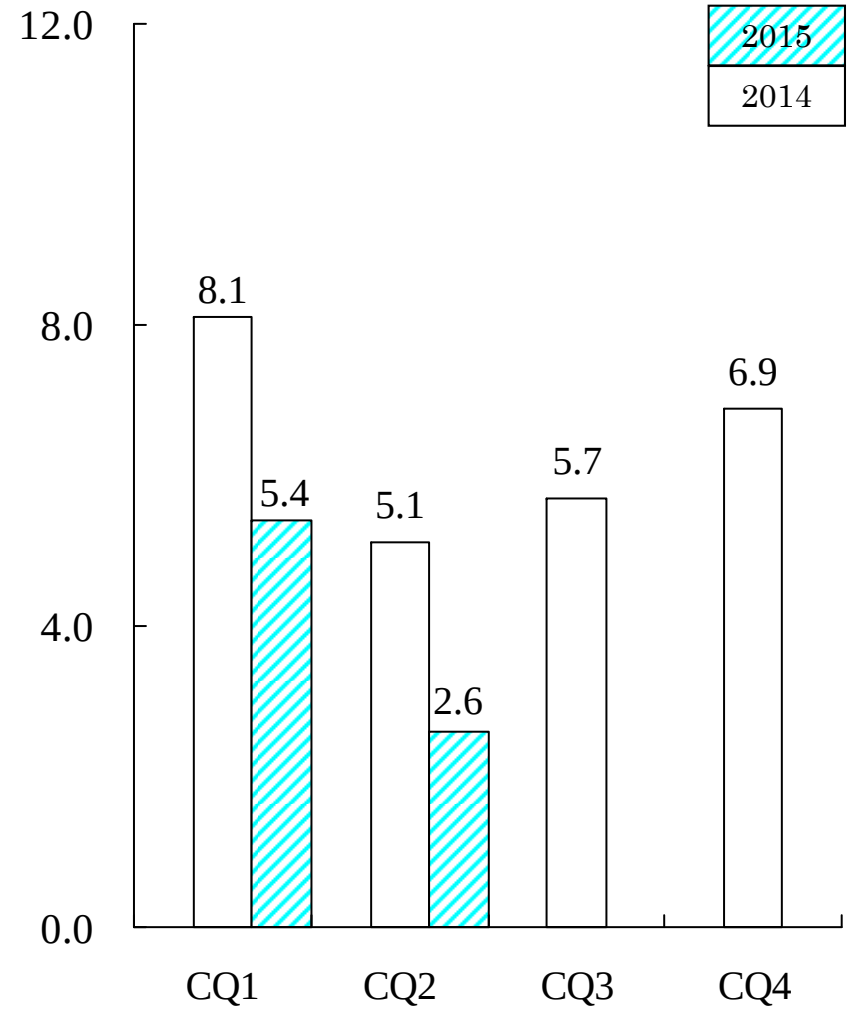
(Unit: Billions of Yen)



(Reference) Quarterly Operating Income by Segment

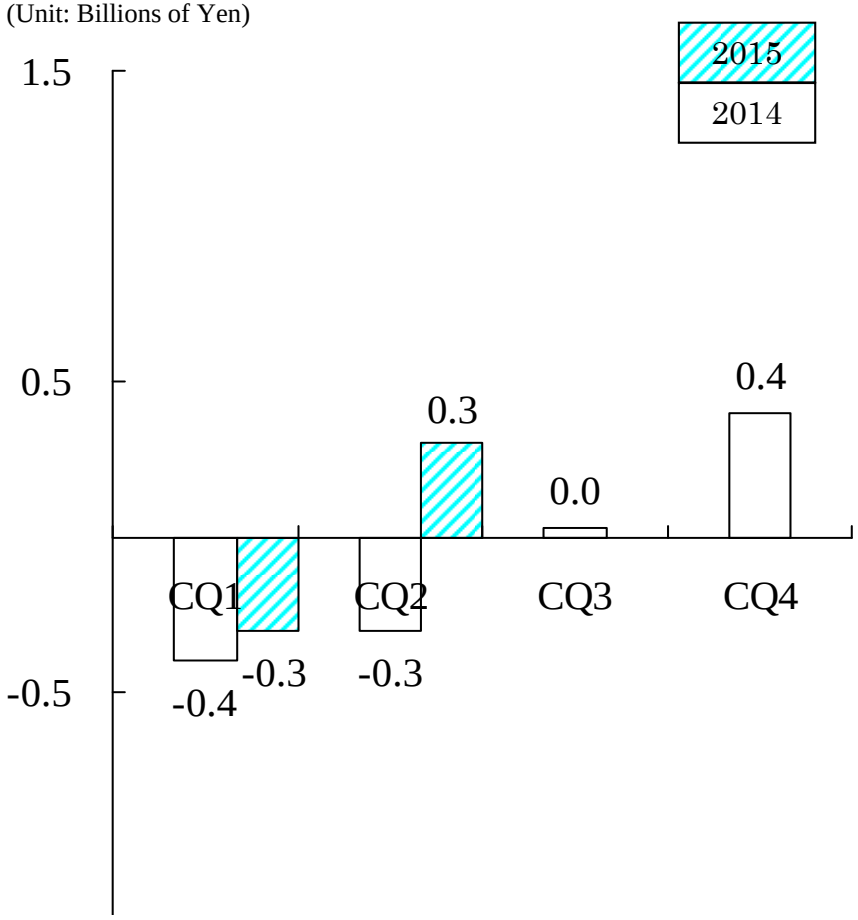
《Electronics》

(Unit: Billions of Yen)



《Inorganics》

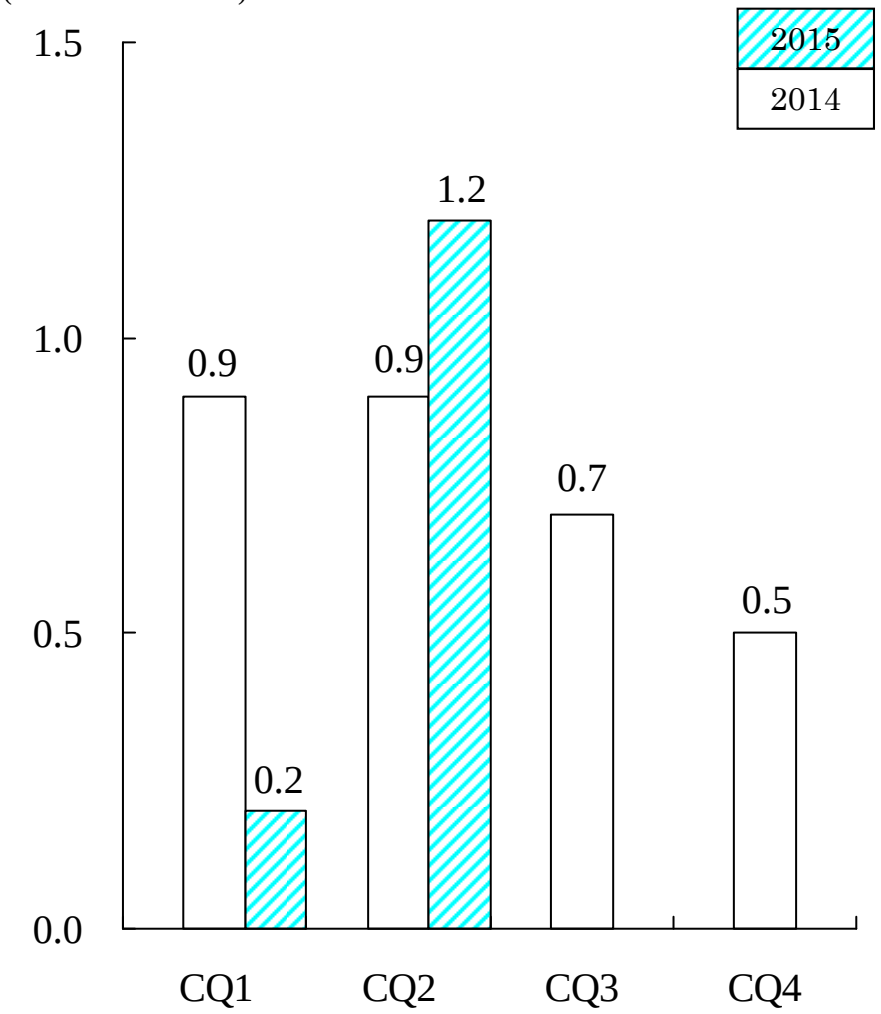
(Unit: Billions of Yen)



(Reference) Quarterly Operating Income by Segment

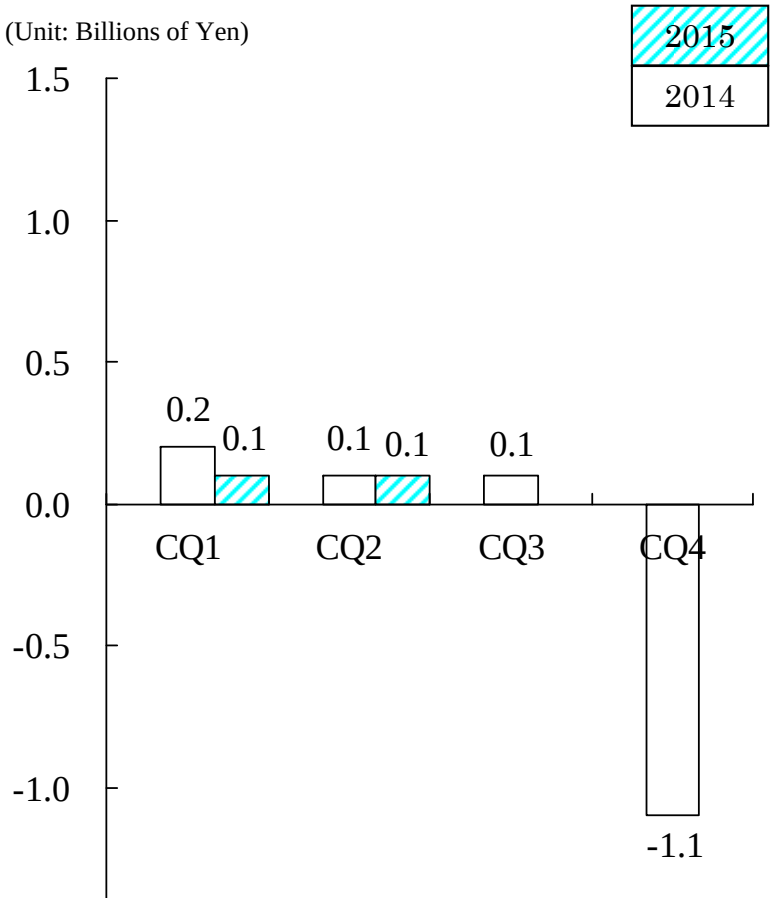
《Aluminum》

(Unit: Billions of Yen)



《Others》

(Unit: Billions of Yen)



Topics

[General]

- **Start of mass production of transparent conductive ink for electronics**

  In May 2015, SDK and Microwave Chemical Co., Ltd. jointly developed a technology to mass produce silver nanowire ink that forms transparent electro-conductive patterns through utilization of printing technology. In 2012, SDK developed printable silver nanowire ink jointly with National University Corporation Osaka University. However, establishment of technology that realizes stable mass production of silver nanowires was a problem. This time, SDK and Microwave Chemical jointly developed a method to synthesize silver nanowires with microwave heating. This production method utilizes the property of silver nanoparticles that, when microwave is irradiated on silver nanoparticles in their growth process to silver nanowires, only the growing ends absorb energy and generate heat. Through this method, SDK successfully produced slender nanowires with great efficiency. SDK will start to offer samples of this ink and related materials.

- **Development of conductive ink for screen printing of film circuits**

  In May 2015, SDK developed an electro-conductive silver ink that can form thin film electronic circuits through screen printing. In recent years, in order to attain higher performance, many electronic devices adopt multilayered circuit boards, and the need for thin film electronic circuits is increasing. However, electronic circuits formulated through screen printing, which is the mainstream method in the field of printed electronics, tends to be thicker than those formed by other methods of printing, and thinning of screen-printed electronic circuits was a pressing matter. This time, SDK successfully developed a silver ink that contains polymers and solvents with advanced proprietary compositions, and secures enough electro-conductivity and viscosity even in the form of thin film, without increasing density of precious silver particles. Electric circuits printed with this new ink can form thin film of less than 1 micrometer in thickness through simple after-treatment process to vaporize and dry solvents out with heat.

Topics

[Petrochemicals segment]

- **Signing multi-technology acetyls licensing agreement with KBR**

  SDK concluded a business alliance agreement with KBR Inc., an engineering company headquartered in Texas, USA, to cooperatively market SDK's proprietary technologies to produce acetic acid and its derivatives (acetyls). Under the licensing agreement, SDK will provide KBR with its proprietary technologies to catalyze and process acetic acid to produce its derivatives, and its skills and know-how on plant operation, which were cultivated over many years. SDK will aim to seek more opportunities to license its proprietary acetyls-related technologies by utilizing KBR's sales network.

[Chemicals segment]

- **Expanding utilization of used plastic to produce liquefied ammonia "*ECOANN*™"**

  In July 2015, SDK completed the expansion of used-plastic gasification facility at the Kawasaki Plant. After the expansion, the percentage of hydrogen from used plastic to produce liquefied ammonia "*ECOANN*™" will increase to 65%. This investment is partly subsidized by the Ministry of Economy, Trade and Industry's interest subsidy program for the promotion of effective utilization of resources*. Under the program, SDK received a loan from the Development Bank of Japan, Inc. The method to produce hydrogen form used plastic entails significantly lower environmental burden compared to the conventional methods to produce hydrogen from petroleum-derived raw materials. *ECOANN*™ has been approved and rated high as "eco-friendly goods for procurement" by major electric power companies. Moreover, in July 2015, SDK's proprietary process to produce this liquefied ammonia was accredited by Japan Environment Association, which sponsors the "Eco Mark Program" to praise environment friendly products/processes, to be eligible for Eco Mark, an official Japanese program in conformity with Type-1 environmental labelling principles hosed by Global Eco-labelling Network*, as the first case of production process in the world. SDK will continue developing environment friendly products and production processes.

*Under this program, the Japanese government provides interest subsidies for bank loans to firms investing in plant and equipment that promote effective utilization of recyclable resources.

**Eco Mark Program is hosted by Japan Environment Association, which is a member of Global Eco-labelling Network. Eco Mark is awarded to products/processes certified by third party certification authorities to have environmental superiority. Certification process of Eco Mark is operated in conformity with Type-1 environmental labelling principles defined in ISO 14024.

Topics

[Chemicals segment]

- Completing high-purity N_2O base in South Korea

  SDK increased its capacity for supplying high-purity nitrous oxide (N_2O), a specialty gas for semiconductor production, by cooperating with Dooam Industrial (Dooam), headquartered in Anseong, Gyeonggi Province, South Korea. The two companies jointly constructed a purification facility within the premises of Dooam's plant near Seoul, and started full-scale operation of the new facility in March 2015. With the addition of the newly completed 600t/y facility in South Korea to the existing 1,200t/y plant in Japan, the Showa Denko Group's high-purity N_2O supply capacity has increased to 1,800t/y in total, which is 1.5 times of the previous level. High-purity N_2O is used for deposition of an insulating oxide film in the process of chemical vapor deposition (CVD) for producing semiconductors and LCDs. For this application, demand for high-purity N_2O in Asia is expected to grow at an annual rate of 10% or more. Under its medium-term consolidated business plan "PEGASUS Phase II," SDK classifies its business in semiconductor processing high-purity gases in the category of "Growth" business. SDK will aim to further expand its production and delivery bases of the business, with focus on Asia.

- Expanding capacities to produce high-purity hydrogen fluoride and high-purity hydrogen bromide

  In March 2015, SDK expanded capacities to produce high-purity hydrogen fluoride (HF) and high-purity hydrogen bromide (HBr), which are specialty gases for semiconductor production. High-purity HF is mainly used as a cleaning gas. In recent years, the number of cases where HF is used as an etching gas in the process of dry etching is increasing. Therefore, SDK expanded its HF production facility in Kawasaki Plant to double the capacity. SDK also decided to build a new facility to produce high-purity HF in the premises of its wholly-owned subsidiary Shanghai Showa Electronics Materials Co. Ltd. The new facility is scheduled to start its operation by the end of 2015. High-purity HBr is used for etching of polysilicon in the manufacturing process of semiconductors including NAND flash memories and DRAMs. SDK is the sole company in the world that has integrated HBr production system from synthesis of crude HBr to purification of it to produce high-purity HBr gas. SDK has been expanding the amount of sales of HBr with its efficient and flexible production system and its advanced purification, analysis and quality control technologies. Since the demand for semiconductor memories is increasing very rapidly centering on the use in portable terminals and data centers, in the second quarter of 2015, SDK expanded its capacity to produce high-purity HBr to 600t/y, which is 1.5 times of the previous level.

Topics

[Chemicals segment]

- **Locating second bulk molding compound plant in China**

  In February 2015, SDK decided to establish a new production site for thermosetting bulk molding compound (BMC*) in Zhuhai, Guangdong Province, China, as its second BMC plant in China, jointly with Eternal Materials Co., Ltd., a synthetic resin manufacturer based in Taiwan. SDK Group's BMC business sector has production sites at three locations, in Japan, Shanghai, and Thailand. SDK Group's sales of BMC in China is expected to continue recording annual growth rate of 15% in average for quite a while, and will exceed the production capacity of the BMC plant in Shanghai. By establishing another BMC plant, SDK Group will strengthen its BMC supply system in the growing Chinese market.

  * BMC is a thermosetting bulk molding compound resin made from unsaturated polyester resin as main component, kneaded together with glass fiber and other additives. BMC is used as headlamp reflectors and engine covers for car applications, and ncapsulation material for home electrical appliances and precision parts.

- **Decision to split and transfer phenolic resin business**

  SDK has decided to split and transfer its phenolic resin business to its wholly owned subsidiary AICA SDK PHENOL CO., LTD. on September 1, 2015. On the same day, SDK will transfer 85% of the AICA SDK PHENOL's share to Aica Kogyo Company, Limited, to make AICA SDK PHENOL a joint corporation.

Topics

[Chemicals segment]

- Launching new slimming/anti-aging cosmetic material

SDK has developed *HCAP*™ (2-palmitoyl hydroxycitric acid; a hydroxycitric acid derivative) as a cosmetic raw material that deeply permeates the skin and cell membrane, contributing significantly to the effect of controlling accumulation of fatty acid and skin anti-aging. As hydroxycitric acid (HCA), which is an active compound, is water soluble and does not readily permeate the skin, its effect was limited when used in cosmetics. SDK, however, has developed a lipophilic derivative of HCA, increasing its transdermal permeability. SDK is already selling Hi-Carnitine, a cosmetic raw material that promotes fat combustion and moisturizes the skin. Thus, SDK can now provide slimming agents based on two different approaches, namely, *HCAP*™ and Hi-Carnitine, looking forward to the synergy effect of them.

[Electronics segment]

- Starting commercial production of 2.5-inch 750 GB HD media

In March 2015, SDK started shipment of 2.5-inch hard disk (HD) media with storage capacity of 750 gigabytes per platter, the world's highest storage capacity for this size available on the market to date*. The new 2.5-inch HD media we started to ship is classified into the eighth-generation of perpendicular magnetic recording (PMR) technology based media. As the world's largest independent HD media supplier, SDK will aim to continue leading the development of HD media with higher capacities including next generation 2.5-inch HD media with storage capacity of 1 terabyte, following the launch of 750 gigabyte media. SDK will also aim to continue meeting expectations of our customers in HDD industry by ensuring stable supply of high-capacity media.

*As of February 5, 2015 (To the best of SDK's knowledge)

Topics

[Inorganics segment]

- Starting commercial operation of a new chemical alumina plant in Indonesia

  PT. Indonesia Chemical Alumina, a joint corporation owned by SDK and PT ANTAM (Persero) Tbk, of Indonesia, started commercial operation of its new chemical alumina plant established in the Tayan District, West Kalimantan, Indonesia. Chemical alumina is used for various industrial applications including electronic materials, chemicals for water treatment, abrasives, and thermal conductive fillers.

[Aluminum segment]

- Completing expansion of high-purity aluminum foil plant in China

  In April 2015, Showa Denko Aluminum (Nantong) Co., Ltd. (SDAN), a consolidated subsidiary of SDK, completed construction work to expand its capacity to produce high-purity aluminum foil for high-voltage use* to be applied to aluminum electrolytic capacitors from 400 tons per month to 600 tons per month, and started its commercial operation. Aluminum electrolytic capacitors are used in wide areas such as electric appliances, IT devices, electric vehicles, and hybrid cars. Especially in China, the demand for medium- and high-voltage electrolytic capacitors is increasing in applications including environment friendly cars and power conditioners for solar power generation. SDK will continue strengthening of SDAN as a base to provide our customers in China with high-purity aluminum foil for high-voltage use in a timely manner.

  *High-purity aluminum foil for high-voltage use is electrolytic foil made from 99.99% purity of aluminum or higher, and has a withstanding voltage of 200V or higher.

Topics

[Aluminum segment]

- **Starting supply of cans for coffee beverages with milk**

  Showa Aluminum Can Corporation, a subsidiary of SDK, set up a new facility to produce aluminum cans for coffee beverages in its Oyama Plant located in Tochigi Prefecture, and started its commercial operation. The scale of domestic market for cans to be used to contain coffee beverages is about 10 billion cans per year, most of which are made of steel. In 2014, the self-restraint guideline set by the beverage makers' association was changed to allow use of aluminum cans to contain coffee with milk. Aluminum cans are expected to increase its share in the coffee beverage container market because aluminum cans are of lighter weight and recycle-friendly.

[Others segment]

- **Launching new LIB-packaging laminates for downsizing**

  Showa Denko Packaging Co., Ltd., a subsidiary of SDK, developed aluminum laminated films with electroconductivity, integrated with electrodes, to be used for packaging pouch type lithium ion batteries (LIBs). Aluminum laminated films with cathodic/anodic structure can eliminate necessity to deposit tab-leads on electrodes to conduct electricity to the outside of LIBs, and make downsizing of LIBs possible. The new laminates also eliminate electrolyte leakage from areas around through paths of tab-leads, and give more heat radiation capacity to LIBs than conventional ones. Moreover, by eliminating conventional cathodic/anodic-metal layers, these new laminates make it possible to manufacture LIBs with less than 50% thickness of conventional ones. Thus, these new laminates are expected to be applied to slim type products with batteries, and driving gears.

Topics

[Others segment]

- SDK and Yamaguchi University ally to promote plant factories

  SDK and National University Corporation Yamaguchi University concluded a partnership agreement to jointly promote global dissemination of our original high-speed plant growth technology "*SHIGYO*™ method" for LED-based plant factories and the results of joint researches related to that method. *SHIGYO*™ method is a technology to accelerate growth of plants by irradiating light emitted from SDK's proprietary ultra-bright red LEDs and blue LEDs in optimum pattern for plant growth. The optimum irradiation methods differ depending on the plant and the environment in which it is grown. Therefore, it is necessary for plant factory operators to receive technical support after introduction of *SHIGYO*™ method. Thus, SDK, with Yamaguchi University, will aim to cooperate with research institutions in various countries in more effective way, and contribute to dissemination and development of plant factories optimized for conditions in each region.