Evolving unique chemical company

2013 Financial Results

- Consolidated -

SHOWA DENKO K.K.

February 13, 2014

Saburo Muto, CFO

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.

Consolidated Companies

- Consolidated subsidiaries: 42
  (4 companies newly consolidated)
  Korea Showa Chemicals Co. (Chemicals Segment)
  Showa Denko Sichuan Carbon Inc. (Inorganics Segment)
  Nagoya Kenmazai Kogyo K.K. (Inorganics Segment)
  SHOKO (Shanghai) Co., Ltd. (Others)

- Equity method applied: 15
  (4 companies excluded)
  Techno Namiken Co., Ltd. (liquidated)
  SANYO SHOWA Panel System Corporation (sold)
  Summit Showa Aluminum Ltd. (sold)
  Showa Parts Corporation (liquidated)

Selected Data

(Average)

	2012	Oct.-Dec.	2013	Oct.-Dec.	Increase/decrease	Oct.-Dec.
Exchange rate: ¥/US$	79.8	81.2	97.7	100.5	Yen depreciated by 17.8	Yen depreciated by 19.3
Domestic naphtha price: ¥/kl	55,050	55,800	65,250	67,800	10,200	12,000
Aluminum LME price: US$/t	2,051	2,021	1,888	1,813	-163	-208

Exchange rate at 2012 year-end: ¥86.6/US$, at 2013 year-end : ¥105.4/US$ ⇒Yen depreciated by ¥18.8/US$

Summary

2012 (Jan.1 – Dec.31) vs. 2013 (Jan.1 – Dec.31)

(Unit: Billions of Yen)

	2012	2013	Increase
Net Sales	739.8	848.1	108.3
Operating Income	28.1	26.0	-2.2
Non-operating income and expenses	-4.7	-2.5	2.2
Interest/Dividend income less interest expenses	-3.5	-2.8	0.7
Equity in earnings or losses of affiliates	0.3	-0.3	-0.6
Currency exchange gain or loss	0.2	2.2	2.0
Other	-1.6	-1.5	0.1
Ordinary Income	23.4	23.5	0.0
Extraordinary Profit	0.8	6.3	5.5
Extraordinary Loss	-13.0	-5.7	7.2
Income before income taxes and minority interests	11.3	24.0	12.7
Income Taxes	-0.3	-13.8	-13.5
Income before minority interests	11.0	10.3	-0.8
Minority Interests in income	-1.7	-1.2	0.5
Net Income	9.4	9.1	-0.3
Net Income per share	¥6.26	¥6.06	¥-0.20

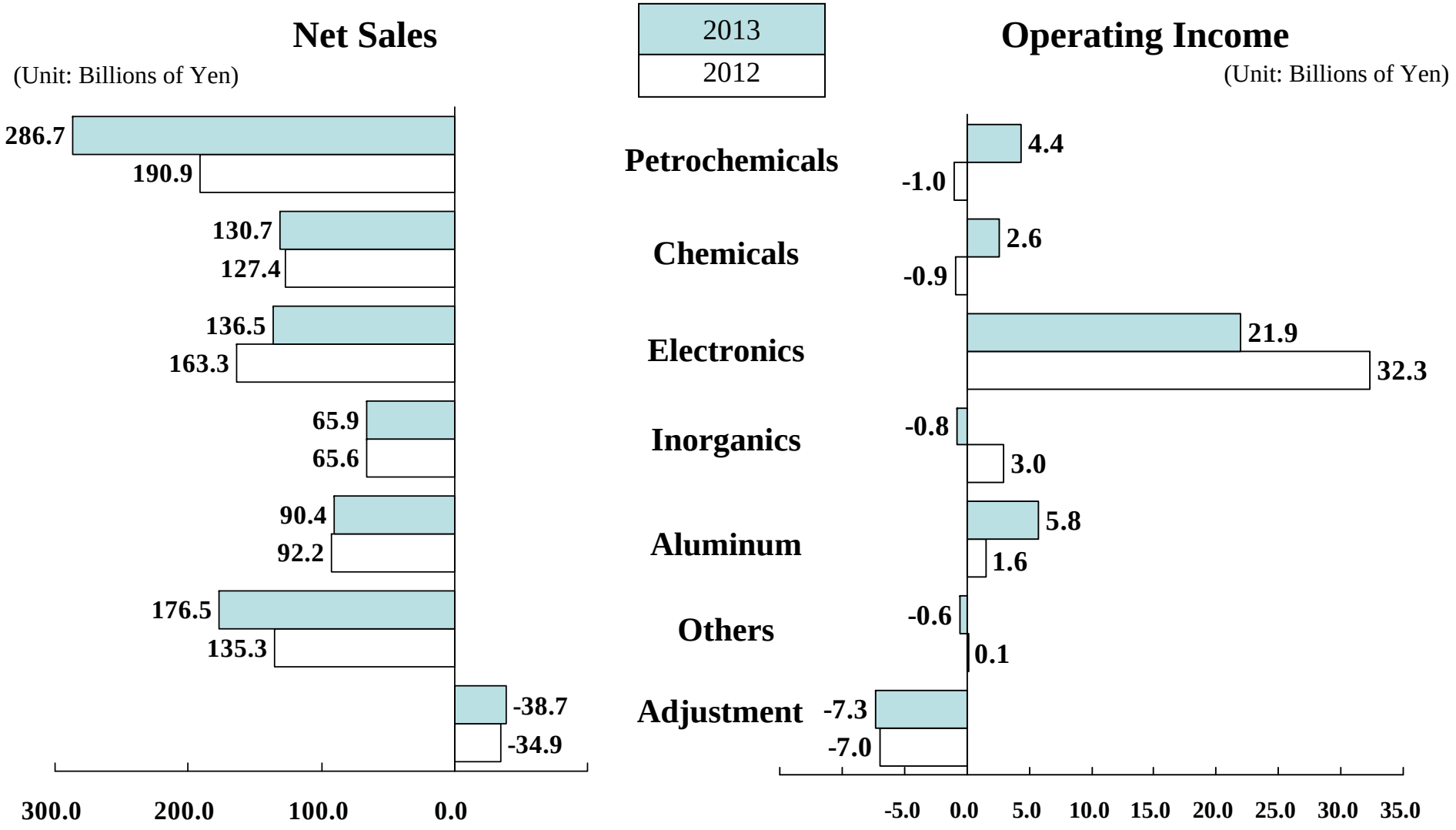
Cash dividends per Share	¥3.00	¥3.00(planned)	—

Extraordinary Profit/Loss

(Unit: Billions of Yen)

	2012	2013	Increase
■Extraordinary Profit	0.8	6.3	5.5
●Gain on sales of investment securities	0.1	5.1	5.0
●Compensation for contract cancellation	-	0.8	0.8
●Other	0.7	0.3	-0.4
■Extraordinary Loss	-13.0	-5.7	7.2
●Loss on sales and retirement of noncurrent assets	-2.0	-1.5	0.6
●Impairment loss	-3.5	-1.4	2.1
●Loss on valuation of investment securities	-3.0	-0.5	2.5
●Other	-4.5	-2.4	2.0
■Extraordinary Profit/Loss, Net	-12.2	0.5	12.7

Sales and Operating Income by Segment



Consolidated Sales by Segment

(Unit: Billions of Yen)

	2012	2013	Increase/ Decrease	
Petrochemicals	190.9	286.7	95.8	Olefins: sales increased (shipment volumes up due to the settlement of the problem with ethylene equipment in CQ1, 2012, price up) Organic chemicals: sales increased (shipment volumes of vinyl acetate and allyl alcohol up)
Chemicals	127.4	130.7	3.3	Basic chemicals: sales increased (ammonia: market prices up, chloroprene rubber: shipment volumes up) Industrial gases: sales decreased (shipment volumes down) Electronic chemicals, Functional chemicals: sales increased (shipment volumes up)
Electronics	163.3	136.5	-26.8	HDs: sales decreased (shipment volumes down due to inventory adjustments in HDD industry) Compound semiconductors: sales decreased due to the transfer of the GaN-based blue LED business Rare earth: sales decreased (shipment volumes down, price down)
Inorganics	65.6	65.9	0.3	Ceramics: sales increased (shipment volumes for electronic applications up) Graphite electrodes: sales decreased (shipment volumes down, price down)
Aluminum	92.2	90.4	-1.8	High-purity foils for capacitors: sales increased (shipment volumes up) Aluminum specialty components: sales increased (shipment volumes of Shotic up) Aluminum cans: sales maintained at the year-earlier level Showa Denko Aluminum Trading K.K. transferred to the Others segment
Others	135.3	176.5	41.2	LIB materials: sales (shipment volumes for smartphones and tablet PC applications up) SHOKO Co., Ltd.: sales increased Shoko (Shanghai) Co., Ltd. : newly consolidated
Adjustment	-34.9	-38.7	-3.8	
Total	739.8	848.1	108.3	

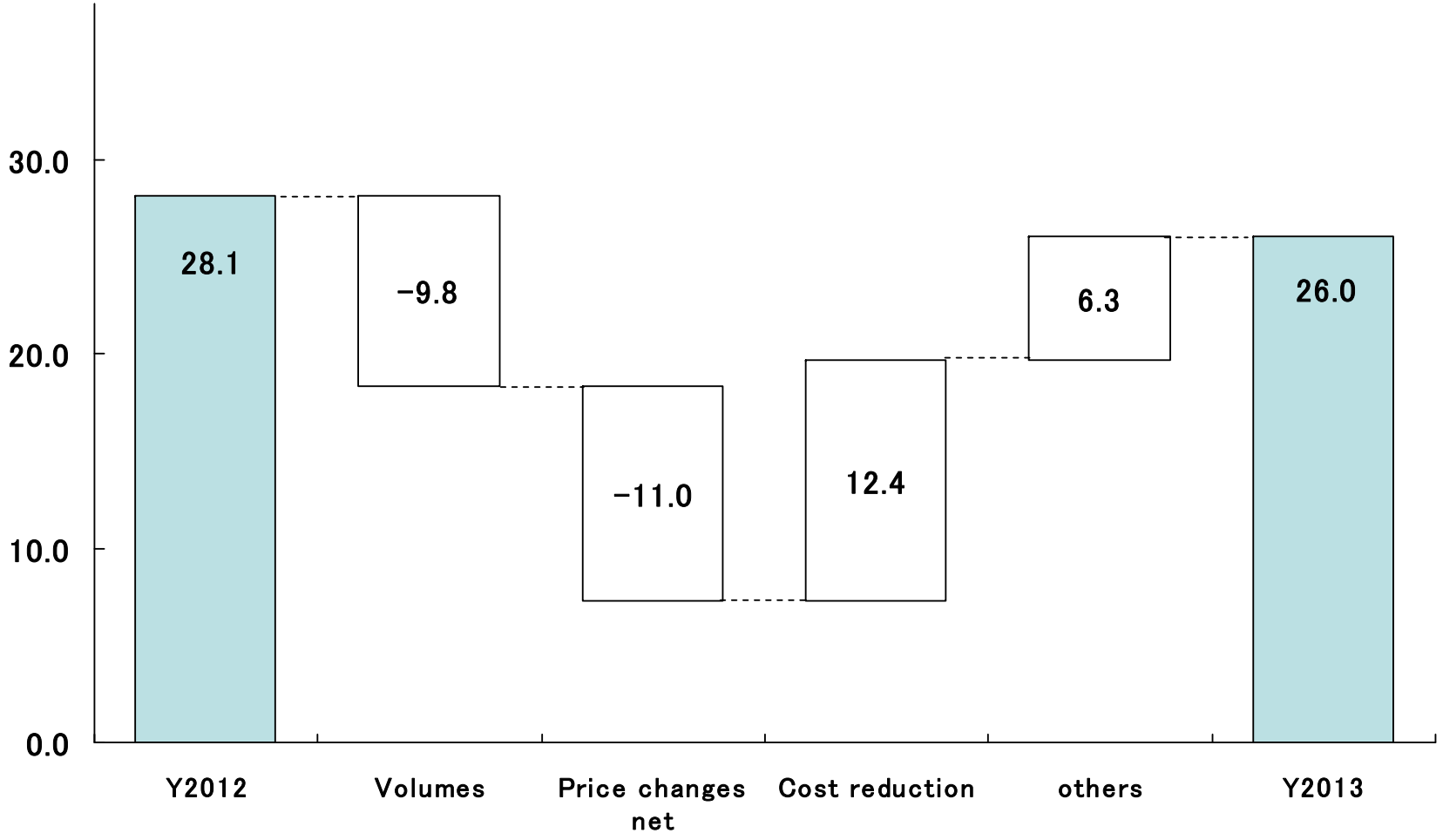
Consolidated Operating Income by Segment

(Unit: Billions of Yen)

	2012	2013	Increase/ decrease	
Petrochemicals	-1.0	4.4	5.4	Olefins: profit increased (shipment volumes up due to the settlement of the problem with ethylene equipment in CQ1, 2012) Organic chemicals: profit slightly increased (shipment volumes up)
Chemicals	-0.9	2.6	3.4	Basic chemicals: profit increased (profit of AN and chloroprene rubber up, ammonia down) Industrial gases, Electronic chemicals, Functional chemicals: profit increased
Electronics	32.3	21.9	-10.4	HDs: profit decreased (shipment volumes down) Compound semiconductors: profit increased Rare earth: profit decreased due to the influence of reductions in book value of inventory, shipment volumes down, price down
Inorganics	3.0	-0.8	-3.8	Ceramics: profit increased (shipment volumes for electronic applications up) Graphite electrodes: profit decreased (shipment volumes down, price down)
Aluminum	1.6	5.8	4.3	High-purity foils for capacitors: profit increased (shipment volumes up) Aluminum specialty components: profit increased (profit for Shotic up) Aluminum cans: profit increased
Others	0.1	-0.6	-0.7	LIB materials: profit decreased (due to increase of the fixed cost) SHOKO Co., Ltd.,: profit increased Shoko (Shanghai) Co., Ltd. : profit increased (newly consolidated)
Adjustment	-7.0	-7.3	-0.3	
Total	28.1	26.0	-2.2	

Operating Income Breakdown by Factor

(Unit: Billions of Yen)



Consolidated Balance Sheet

(Unit: Billions of Yen)

Assets	Dec.31, 2012	Dec.31, 2013	Increase/ decrease	Liabilities and Shareholders' Equity	Dec.31, 2012	Dec.31, 2013	Increase/ decrease
Cash and deposits	51.6	68.2	16.6	Notes and accounts payable	107.2	124.2	17.0
Notes and accounts receivable	138.2	156.1	17.9	Interest-bearing debt	342.3	353.7	11.4
Inventories	121.8	120.2	-1.6	Provision for retirement benefits	23.4	20.3	-3.1
Other current assets	30.6	30.1	-0.4	Other liabilities	145.3	141.8	-3.5
Total Current Assets	342.1	374.6	32.5	Total Liabilities	618.2	640.0	21.8
Buildings and structures	81.6	85.5	3.9	Capital stock	140.6	140.6	—
Machinery and equipment	115.2	111.6	-3.5	Capital surplus	62.2	62.2	0.0
Land	254.3	254.6	0.3	Retained earnings	53.2	58.4	5.2
Other tangible fixed assets	22.2	42.4	20.2	Treasury stock	-0.1	-0.1	0.0
Tangible Fixed Assets	473.3	494.1	20.8	Total Shareholders' equity	255.8	261.0	5.2
Intangible Fixed Assets	10.3	11.0	0.6	Valuation difference on available-for-sale securities	0.9	5.8	4.9
Investments and other assets	107.5	106.1	-1.4	Foreign currency translation adjustment, Deferred hedge gains	-12.0	6.4	18.4
Incl. Investment securities	67.8	78.7	10.9	Revaluation reserve for land	28.0	27.9	-0.1
				Total accumulated other comprehensive income	16.9	40.2	23.2
				Minority Interests	42.2	44.6	2.4
Total fixed assets	591.1	611.2	20.1	Total net assets	315.0	345.8	30.8
Total Assets	**933.2**	**985.8**	**52.6**	**Total Liabilities and Net Assets**	**933.2**	**985.8**	**52.6**

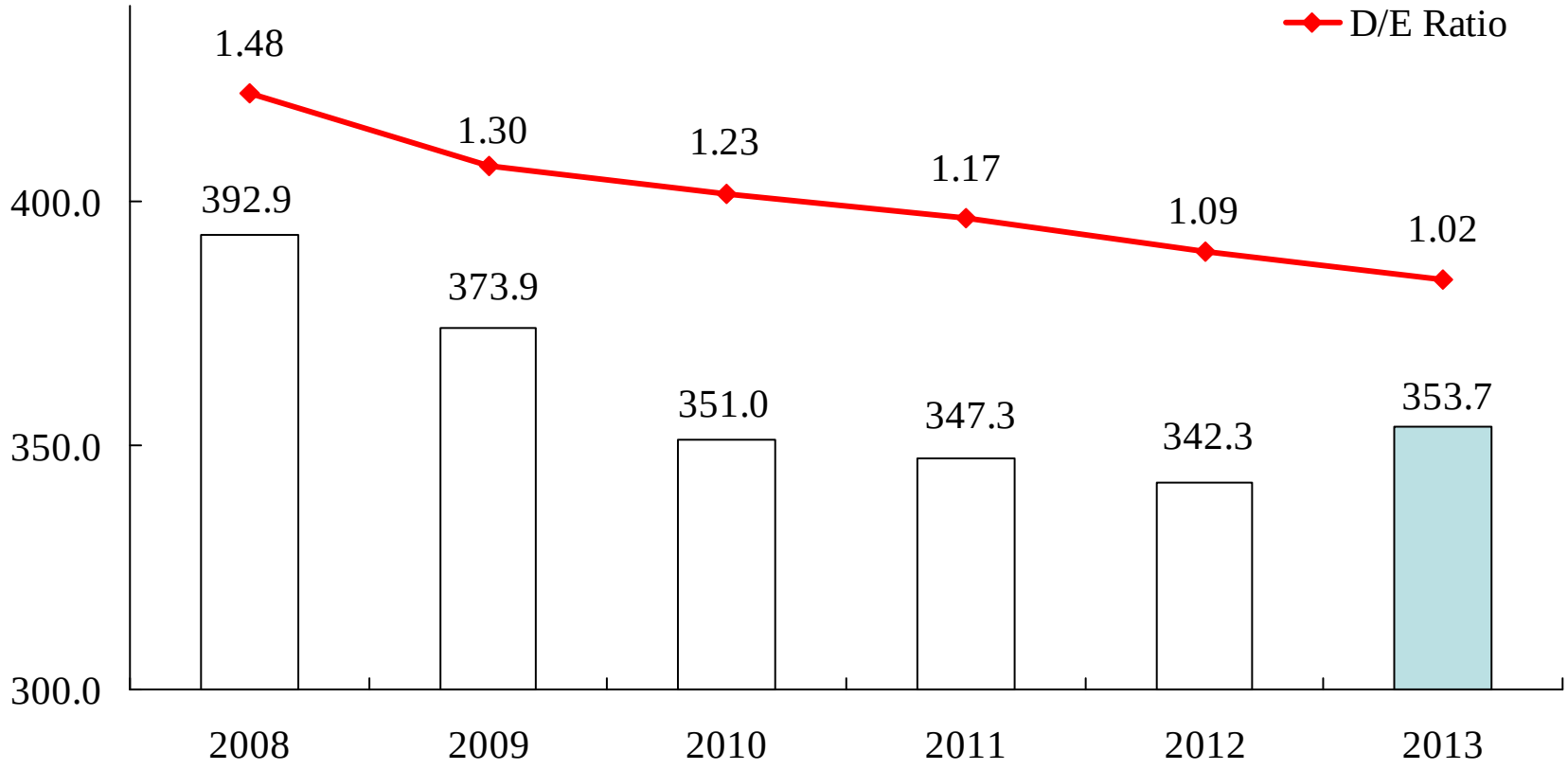
Total Assets
Interest-bearing Debt and D/E ratio

(Unit: Billions of Yen, times, %)

	Dec.31, 2012	Dec.31, 2013	Increase/ Decrease
● **Total assets**	933.2	985.8	52.6
● **Interest-bearing debt**	342.3	353.7	11.4
● **Debt/Equity ratio**	1.09times	1.02times	0.07p improved
● **Stockholders' Equity ratio**	29.2%	30.6%	1.3p

Interest-bearing Debt

（Unit: Billions of Yen)



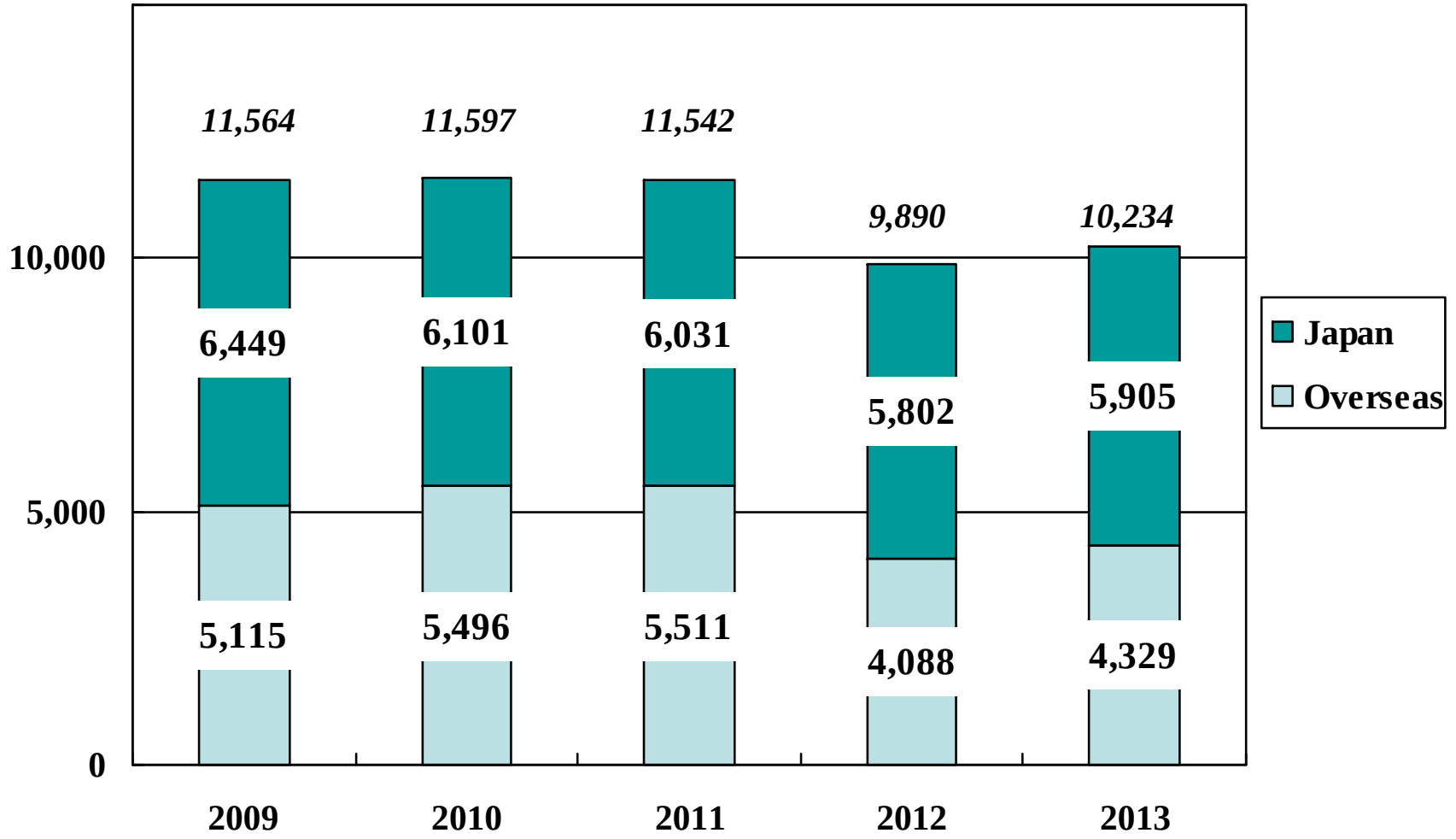
Equity ratio	25.0%	25.5%	26.1%	26.8%	29.2%	30.6%

Consolidated Cash Flows

(Unit: Billions of Yen)

	2012	2013	Increase/ Decrease
●CF from Operating Activities	53.3	63.6	10.3
●CF from Investing Activities	-40.2	-46.7	-6.5
●Free CF	13.1	16.8	3.7
●CF from Financing Activities	-20.2	-6.8	13.3
●Others	3.3	5.6	2.4
Increase of cash and equivalents	-3.8	15.7	19.4

Total number of employees and breakdown by location



	2009	2010	2011	2012	2013
Japan	55.8%	52.6%	52.3%	58.7%	57.7%
Overseas	44.2%	47.4%	47.7%	41.3%	42.3%

Capital expenditures/ Depreciation by Segment

(Unit: Billions of Yen)

	2012		2013		Increase/Decrease	
	Capital expenditures	Depreciation	Capital expenditures	Depreciation	Capital expenditures	Depreciation
Petrochemicals	3.7	7.2	2.9	6.4	-0.8	-0.8
Chemicals	8.5	9.2	6.7	7.3	-1.7	-1.9
Electronics	11.7	16.3	6.1	14.2	-5.6	-2.1
Inorganics	8.4	3.4	18.3	3.1	9.8	-0.3
Aluminum	4.3	6.1	6.3	4.3	2.0	-1.8
Others	5.9	4.1	4.0	4.4	-1.9	0.3
Total	42.5	46.2	44.4	39.8	1.9	-6.5

Selected Data 2013, 2014 Forecast (Consolidated)

(* Unit: Billions of Yen)

	2012	2013	2013-2012 Increase/ Decrease	2014 Forecast	2014-2013 Increase/ Decrease
●Exchange rate: ¥/US$	79.8	97.7	17.8	100.0	Yen will depreciate by 2.3
●Domestic naphtha price: ¥/kl	55,050	65,250	10,200	65,700	450
●Aluminum LME price: US$/t	2,051	1,888	163	1,820	-68
●Interest-bearing debt*	342.3	353.7	11.4	355.0	1.3
●Interest/dividend income less interest expenses*	-3.5	-2.8	0.7	-3.4	-0.6
●R&D expenditures*	20.6	20.4	-0.2	20.2	-0.2
●Number of employees: people	9,890	10,234	344	10,732	498
●Total employment cost*	70.6	70.2	-0.5	76.1	5.9

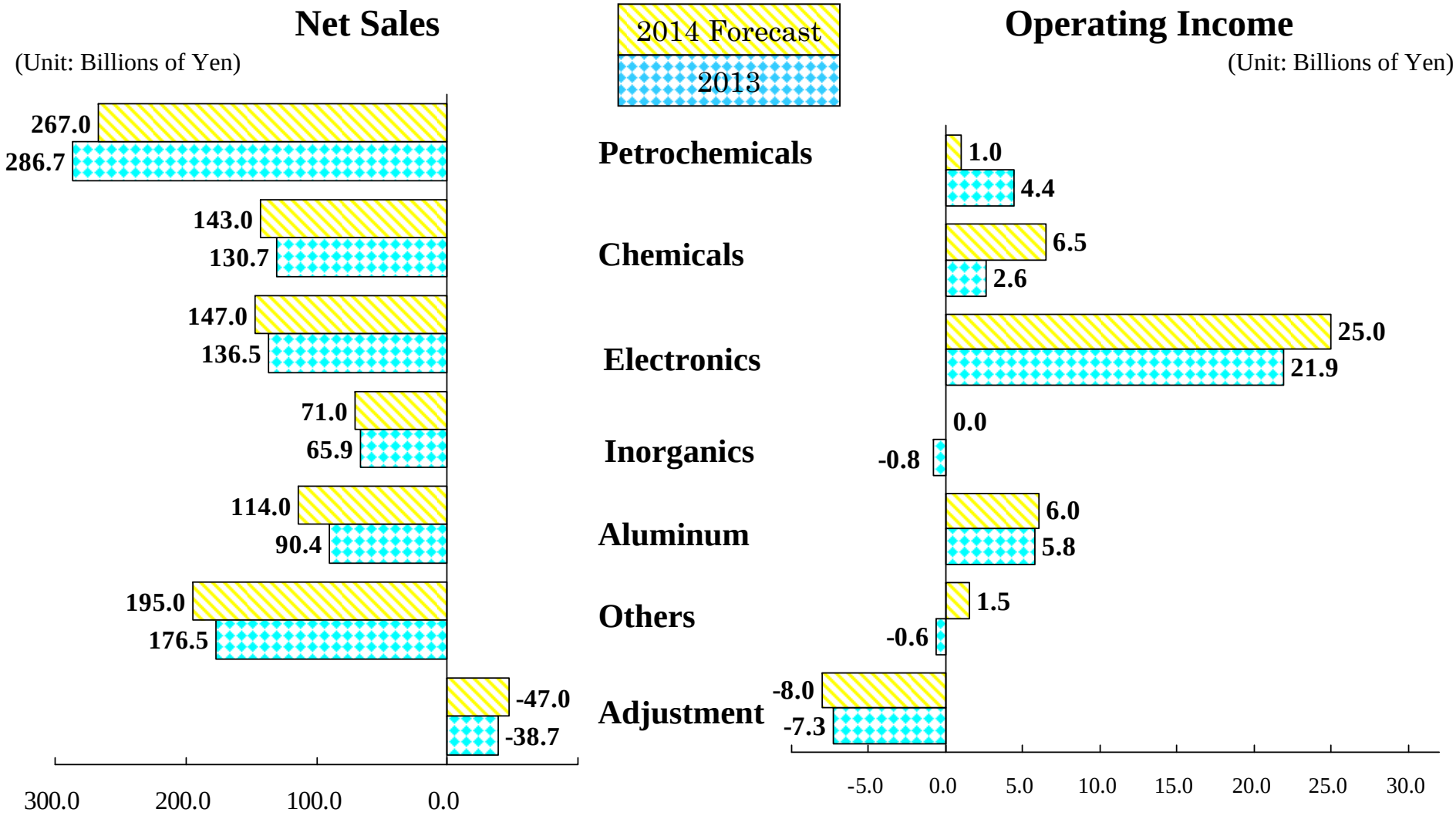
2014 Forecast (Consolidated)

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

	2013	2014 Forecast	Increase
Net Sales	848.1	890.0	41.9
Operating Income	26.0	32.0	6.0
Interest/dividend income less interest expenses	-2.5	-7.0	-4.5
Ordinary Income	23.5	25.0	1.5
Extraordinary Profit	0.5	-8.0	-8.5
Extraordinary Loss			
Net Income	9.1	12.0	2.9
Net Income per Share	¥6.06	¥8.02	¥1.96

Cash dividends per Share	¥3.00(planned)	¥3.00	-

Sales and Operating Income
Forecast for 2014



Net Sales by Segment, 2014 Forecast (Consolidated)

(Unit: Billions of Yen)

	2013	2014 Forecast	Increase/ Decrease	Comments
Petrochemicals	286.7	267.0	-19.7	Shipment volumes down due to the shutdown maintenance
Chemicals	130.7	143.0	12.3	Basic chemicals, Electronic chemicals: sales increase expected (shipment volumes up)
Electronics	136.5	147.0	10.5	HDs: sales expected to maintain earlier-year level Rare earth: sales increase expected (shipment volumes up)
Inorganics	65.9	71.0	5.1	Ceramics: sales increase expected Graphite electrodes: sales increase expected
Aluminum	90.4	114.0	23.6	Rolled products, Specialty products: sales increase expected (shipment volumes up) Cans: sales increase (acquisition of aluminum can maker in Vietnam)
Others	176.5	195.0	18.5	SHOKO Co., Ltd.: sales increase expected
Adjustment	-38.7	-47.0	-8.3	
Total	848.1	890,0	41.9	

Operating Income, 2014 Forecast (Consolidated)

(Unit: Billions of Yen)

	2013	2014 Forecast	Increase/ Decrease	Comments
Petrochemicals	4.4	1.0	-3.4	Shipment volumes down due to the shutdown maintenance
Chemicals	2.6	6.5	3.9	Basic chemicals, Electronic chemicals: profit increase expected (shipment volumes up)
Electronics	21.9	25.0	3.1	HDs: profit decrease expected Rare earth: profit increase expected
Inorganics	-0.8	0.0	0.8	Graphite electrodes: profit increase expected
Aluminum	5.8	6.0	0.2	Rolled products: profit increase expected
Others	-0.6	1.5	2.1	LIB materials: profit increase expected
Adjustment	-7.3	-8.0	-0.7	
Total	26.0	32.0	6.0	

Consolidated Cash Flows, 2014 Forecast

(Unit: Billions of Yen)

	2013	2014 Forecast	Increase/ Decrease
●CF from Operating Activities	63.6	65.0	1.4
●CF from Investing Activities	-46.7	-60.0	-13.3
●Free CF	16.8	5.0	-11.8
●CF from Financing Activities	-6.8	-12.1	-5.3
●Others	5.6	0.4	-5.2
Increase of cash and equivalents	15.7	-6.8	-22.5

Capital expenditures/Depreciation by Segment
2014 Forecast

(Unit: Billions of Yen)

	2013		2014 Forecast		Increase/Decrease	
	Capital expenditures	Depreciation	Capital expenditures	Depreciation	Capital expenditures	Depreciation
Petrochemicals	2.9	6.4	4.4	6.6	1.5	0.2
Chemicals	6.7	7.3	9.1	7.3	2.4	0.0
Electronics	6.1	14.2	10.5	12.8	4.3	-1.4
Inorganics	18.3	3.1	13.6	4.1	-4.7	1.0
Aluminum	6.3	4.3	10.2	5.3	4.0	1.0
Others	4.0	4.4	4.1	4.9	0.1	0.5
Total	44.4	39.8	52.0	41.0	7.6	1.3

(Reference) CQ4 Summary

CQ4 (Oct.1 – Dec.31), 2012 vs. CQ4 (Oct.1 – Dec.31), 2013

(Unit: Billions of Yen)

	CQ4, 2012	CQ4, 2013	Increase
Net Sales	192.9	230.5	37.7
Operating Income	4.3	10.1	5.8
Non-operating income and expense	-0.6	1.0	1.6
Interest/Dividend income less expenses	-0.8	-0.7	0.1
Equity in earnings of affiliates	0.6	0.3	-0.3
Foreign exchange gain or loss	0.7	1.4	0.7
Other	-1.1	0.0	1.1
Ordinary Income	3.7	11.1	7.4
Extraordinary Income	0.3	4.3	4.0
Extraordinary Loss	-5.3	-2.0	3.3
Income before income taxes and minority interests	-1.3	13.4	14.7
Income Taxes	-0.2	-11.0	10.8
Income before minority interests	-1.5	2.5	3.9
Minority Interests in income	-0.4	0.1	0.3
Net Income	-1.9	2.3	4.2

(Reference) Consolidated Sales by Segment

CQ4 (Oct.1 – Dec.31), 2012 vs. CQ4 (Oct.1 – Dec.31), 2013

(Unit: Billions of Yen)

	CQ4 2012	CQ4 2013	Increase/ decrease	
Petrochemicals	59.5	79.2	19.6	Olefins: sales increased (shipment volumes up, price up) Organic chemicals: sales increased (shipment volumes up)
Chemicals	32.9	35.1	2.2	Basic chemicals: sales increased (AN: market prices up, chloroprene rubber: shipment volumes up) Industrial gases: sales increased (shipment volumes of dry ice up) Electronic chemicals: sales increased (export shipment volumes up) Functional chemicals: sales increased (shipment volumes up)
Electronics	36.0	37.3	1.3	HDs : sales increased Compound semiconductors: sales decreased due to the transfer of the GaN-based blue LED business Rare earth: sales increased (shipment volumes up)
Inorganics	16.5	17.0	0.4	Ceramics: sales increased (shipment volumes up) Graphite electrodes: sales decreased (shipment volumes down, prices down)
Aluminum	22.3	23.2	0.9	High purity foils for capacitors: sales increased (shipment volumes up) Aluminum specialty components: sales increased (shipment volumes of Shotic up) Aluminum cans : sales maintained at the year-earlier level Showa Denko Aluminum Trading K.K. transferred to the Others segment
Others	33.9	49.2	15.3	LIB materials: sales increased (shipment volumes for electric vehicles up) SHOKO Co., Ltd.: sales increased Shoko (Shanghai) Co., Ltd.: newly consolidated
Adjustment	-8.3	-10.4	-2.1	
Total	192.9	230.5	37.7	

(Reference) Consolidated Operating Income by Segment

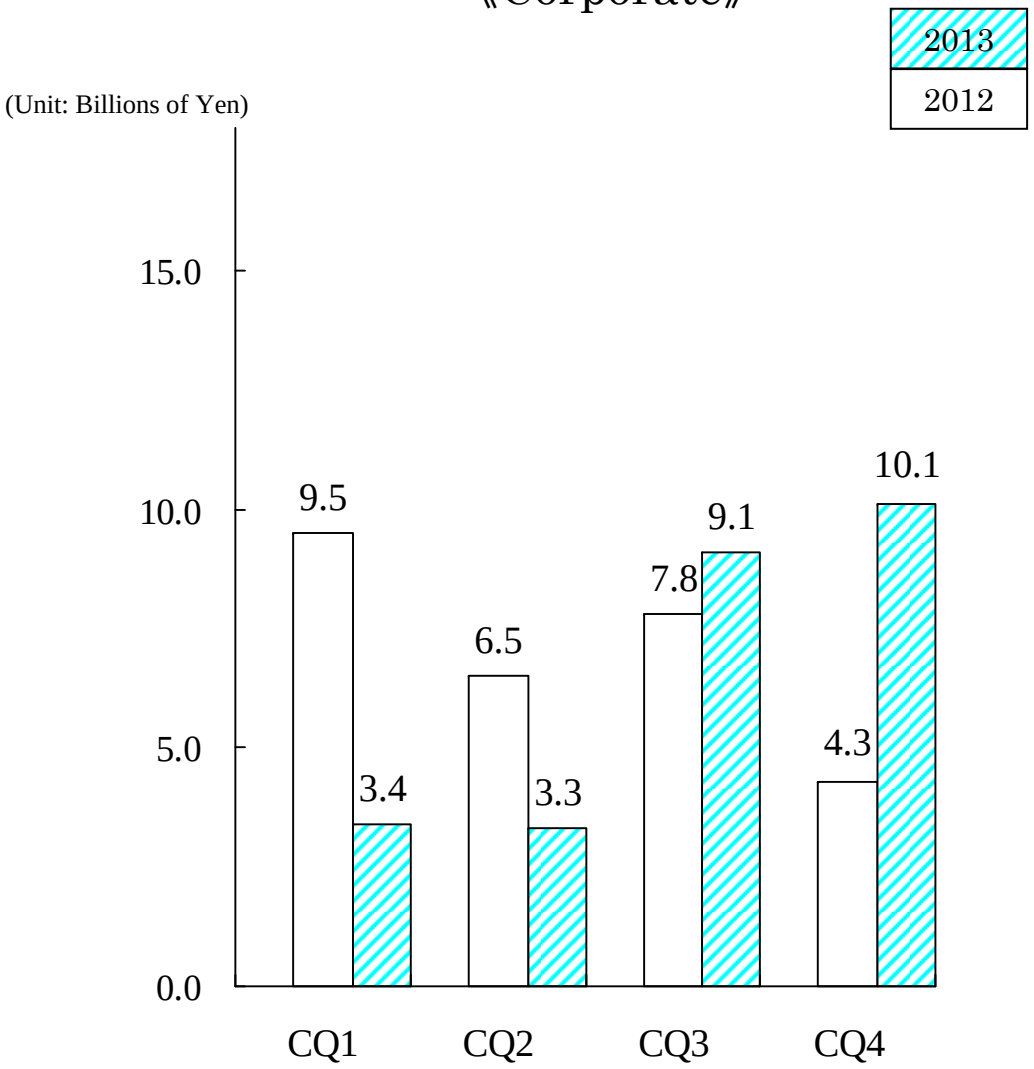
CQ4 (Oct.1 – Dec.31), 2012 vs. CQ4 (Oct.1 – Dec.31), 2013

(Unit: Billions of Yen)

	CQ4 2012	CQ4 2013	Increase/ decrease	
Petrochemicals	1.2	2.4	1.2	Olefins: profit increased (market prices up) Organic chemicals: profit slightly decreased
Chemicals	-0.6	1.3	1.9	Basic chemicals: profit increased (AN, chloroprene rubber: up) Industrial gases: profit increased Electronic chemicals: profit increased (export shipment volumes up) Functional chemicals: profit increased (reflecting higher cost of raw materials)
Electronics	5.9	7.8	1.9	HDs: profit increased Compound semiconductors: profit increased Rare earth: profit increased
Inorganics	0.1	-0.5	-0.6	Ceramics: profit increased Graphite electrodes: profit decreased (shipment volumes down, price down)
Aluminum	-0.1	1.0	1.1	High-purity foils for capacitors: profit increased (shipment volumes up) Aluminum specialty components: profit increased (shipment volumes of Shotic up) Aluminum cans: profit maintained at the earlier-year level
Others	-0.1	0.2	0.3	LIB materials: profit maintained at the earlier-year level SHOKO Co., Ltd.: profit increased Shoko (Shanghai) Co., Ltd.: newly consolidated
Adjustment	-2.1	-2.0	0.0	
Total	4.3	10.1	5.8	

(Reference)　Quarterly Operating Income

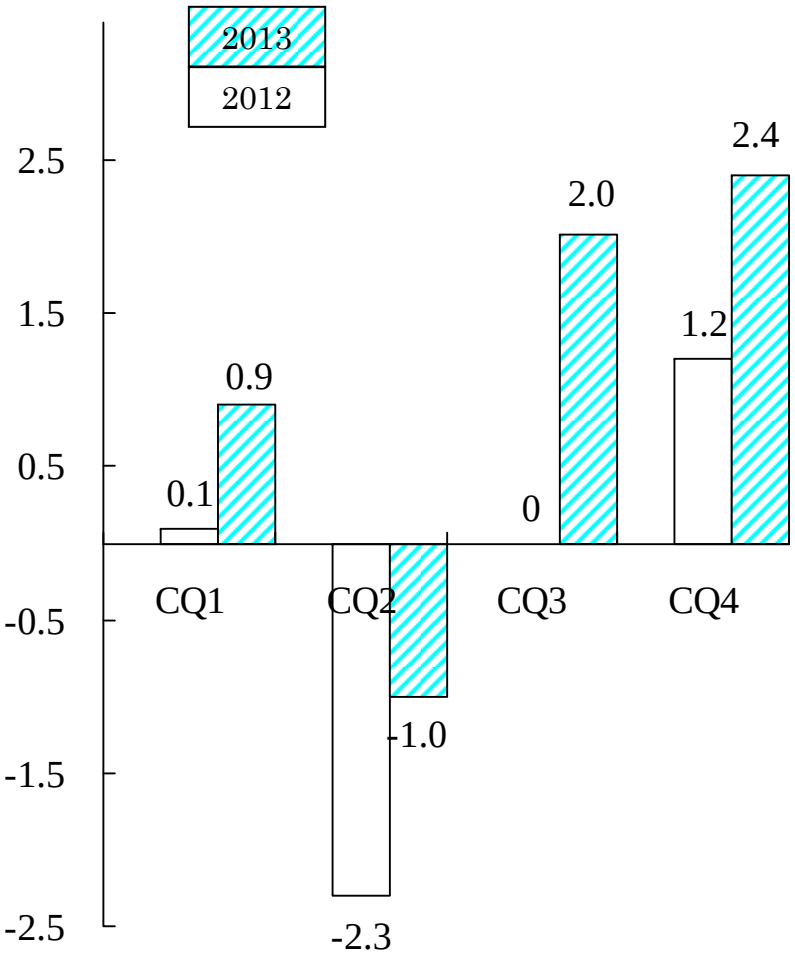
《Corporate》



(Reference) Quarterly Operating Income

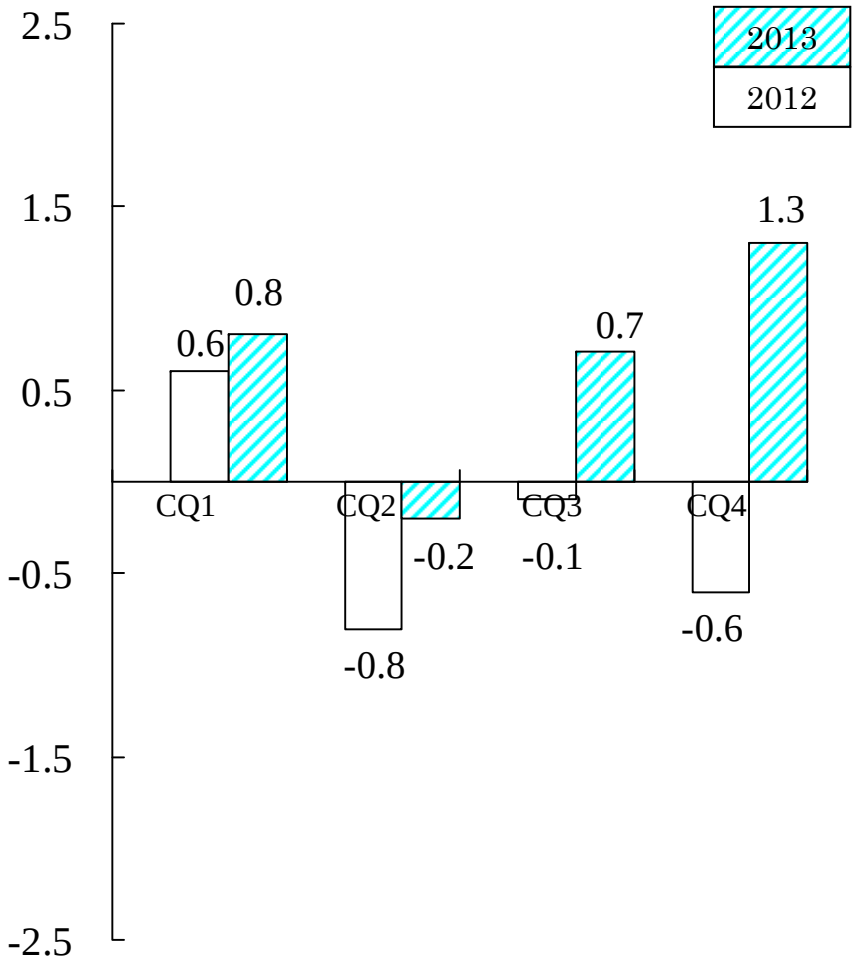
《Petrochemicals》

(Unit: Billions of Yen)



《Chemicals》

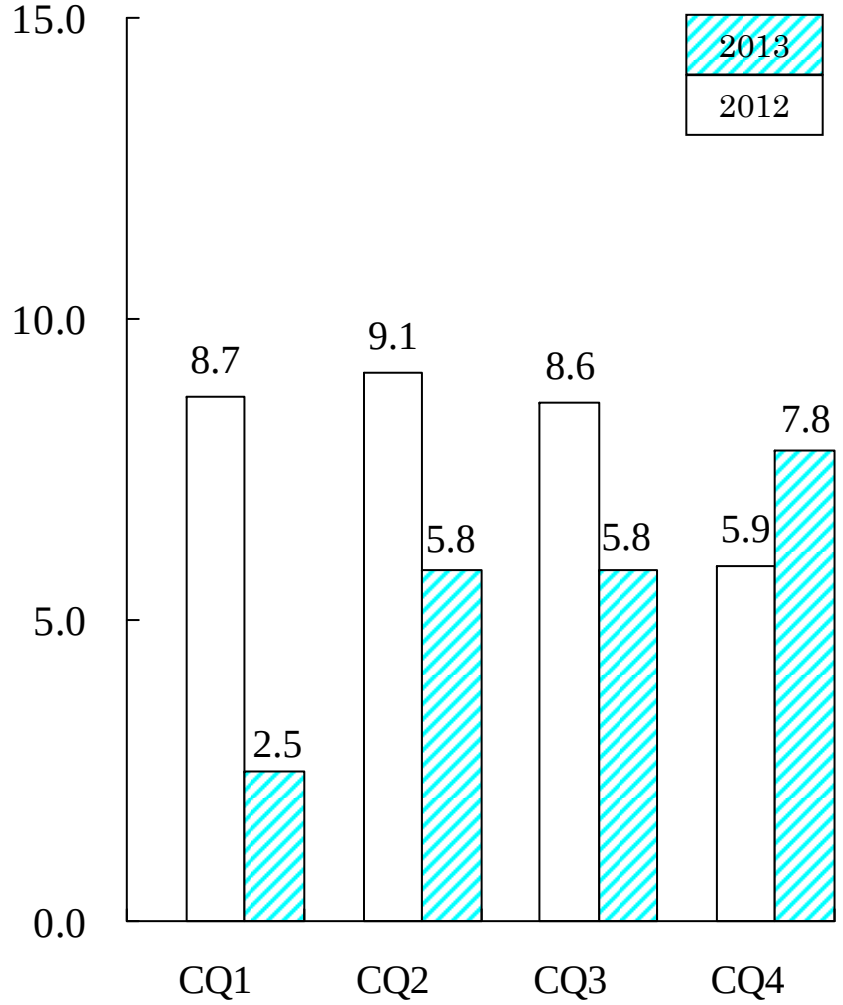
(Unit: Billions of Yen)



(Reference) Quarterly Operating Income

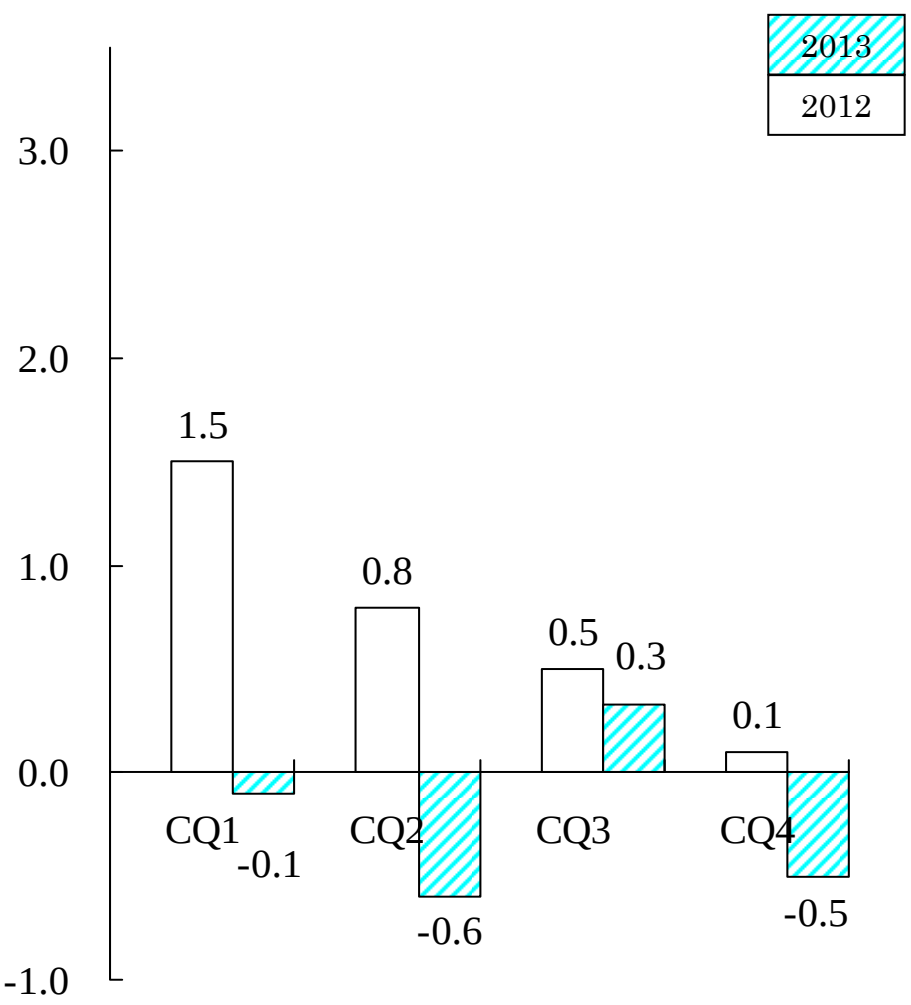
《Electronics》

(Unit: Billions of Yen)



《Inorganics》

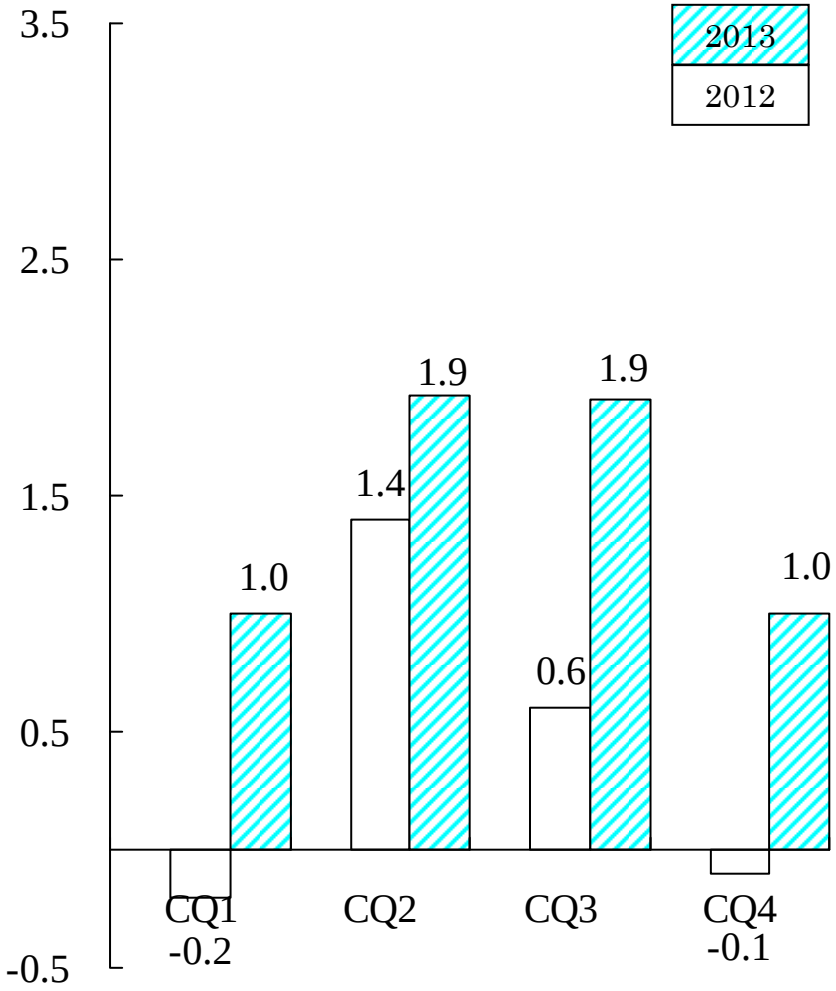
(Unit: Billions of Yen)



(Reference) Quarterly Operating Income

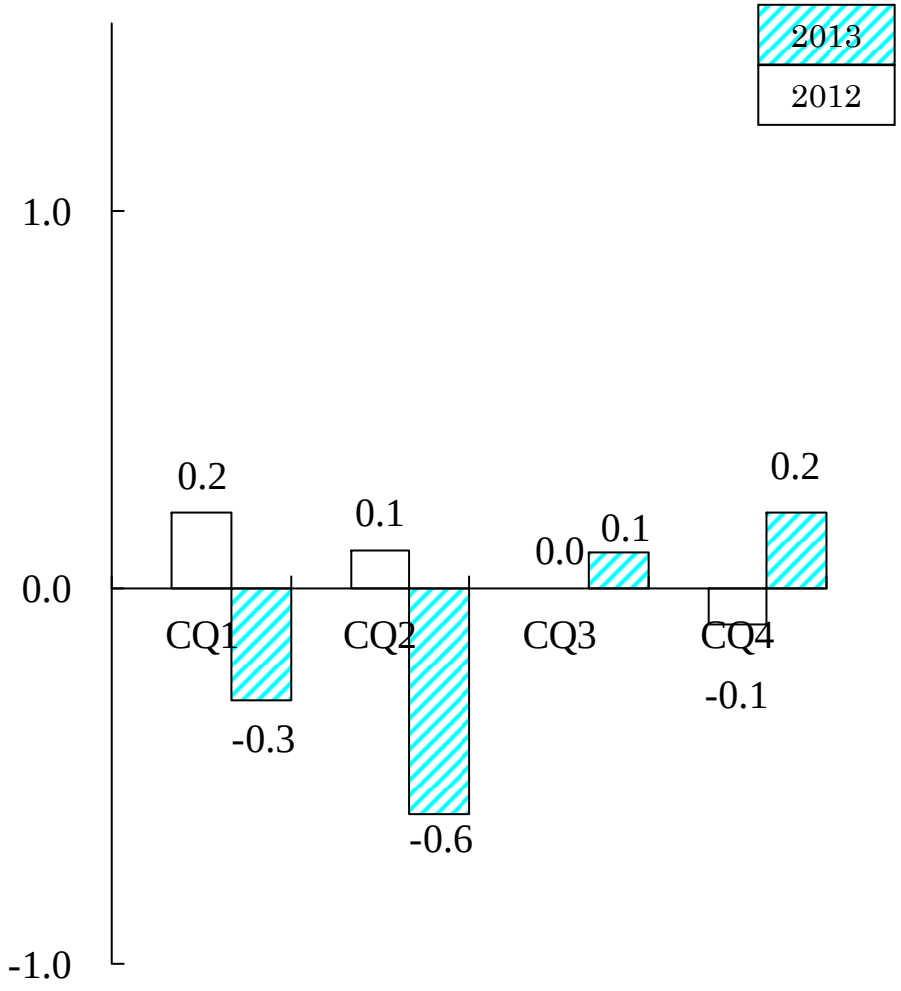
《Aluminum》

(Unit: Billions of Yen)



《Others》

(Unit: Billions of Yen)



Topics

[General]

● Strategic partnership in the fullerene business

In January, SDK entered into a strategic partnership with Mitsubishi Corporation (MC) in the fullerene business. As part of the arrangement, SDK acquired from MC a 50% stake in Frontier Carbon Corporation (FCC), a producer and marketer of fullerene products, thereby making FCC a 50-50 joint venture between MC and SDK. Fullerene is a molecule composed entirely of carbon. It takes the form of a soccer ball and is one nanometer in diameter. As the molecule is soluble in organic solvents and is an excellent electron acceptor, it is seen as a promising material in the field of electronics, particularly for such applications as n-type material for organic photovoltaic cells. SDK has over 10 years of experience commercially producing carbon nanotube (*VGCF*™). SDK is therefore confident that its nanotechnology acquired through the VGCF business can be practically applied to the fullerene business. SDK and FCC will jointly undertake R&D and marketing activities towards the commercialization of fullerene products.

● Launch of six-inch SiC epitaxial wafers for power devices

In October, SDK began commercial shipments of silicon carbide (SiC) epitaxial wafers with a diameter of six inches—the largest size currently available on the world market—for use in power devices. As the commercial production of six-inch SiC epitaxial wafers will help reduce power-device production costs, SiC power devices are expected to be increasingly used in electric vehicles, in addition to existing applications such as power sources of servers for data centers and subway railcars. The company also started selling a new grade of four-inch SiC epitaxial wafers with fewer crystal defects and higher uniformity. Following the expansion of product lines, SDK will continue its efforts to improve quality and increase production capacity. SDK is planning to increase its SiC epitaxial wafer production capacity from 1,500 units a month (in terms of four-inch wafers) at present, to 2,500 units a month by the middle of 2014.

Topics

[Petrochemicals segment]

- **Construction of new ethyl acetate plant based on new technology**

SDK decided to build a 100,000t/y ethyl acetate plant at its Oita Complex using its proprietary process technology (direct addition of ethylene to acetic acid). The plant will start commercial production in June 2014. Ethyl acetate is used in wide-ranging applications, including printing ink, paint, electronic materials, pharmaceuticals, and agrochemicals. Demand for the product is expected to continue growing inside and outside Japan. SDK has developed an innovative process technology that enables efficient production of high-quality ethyl acetate, using a solid heteropolyacid catalyst developed by SDK. The technology won Green & Sustainable Chemistry Network's 6th GSC Award (Minister of Economy, Trade and Industry Prize) and The Chemical Society of Japan's 56th CSJ Award for Technical Development. Furthermore, the Ministry of Economy, Trade and Industry has decided to subsidize this new ethyl acetate plant as "investment in leading-edge-technology-based plant and equipment."

[Chemicals segment]

- **Expanding sales of liquefied ammonia in the Tohoku region**

In June, SDK started reconstruction work of its liquefied ammonia distribution base in Soma District, Fukushima Prefecture, which had been damaged by the Great East Japan Earthquake. The facility will reopen in March 2014. SDK's liquefied ammonia (*Ecoann*™) is approved as "eco-friendly goods for procurement" by major electric power companies because the product is partly based on used plastics. Liquefied ammonia is used in the production of synthetic fibers. It is also used for removing nitrogen oxides contained in exhaust gas from thermal electric power plants. SDK forecasts steady demand for *Ecoann*™ as thermal electric power plants are expected to continue operating at high rates. To further expand sales of *Ecoann*™ as an important component of the basic chemicals business, SDK decided to operate the liquefied ammonia distribution base in Soma District by itself. In this connection, SDK merged Marusho Kogyo Co., Ltd., a wholly owned subsidiary for operating the base, in April.

Topics

[Chemicals segment]

- **Starting commercial production of anode binder for LIBs**

  In February, SDK started volume production of "*Polysol*™ LB Series" water-based anode binder for LIBs. The product is a water-based emulsion containing acrylic synthetic resin particles, ensuring lower environmental impact at the time of LIB production compared with solvent-based binders. It provides such advantages as low electrical resistance, good temperature characteristics, and good adhesion to anode collectors, thereby contributing toward extending the life and increasing the capacity of LIBs. A binder causes cathode/anode active materials (for release and intake of lithium ions) to stick together. It also causes additives to stick together, and active materials to adhere to collectors. Thus, the product is attracting attention as one of the key materials that largely influence the performance of LIBs.

- **Construction of new high silica zeolite plant**

  Union Showa (USKK), a joint venture between SDK and UOP LLC, of the United States, decided to start producing high silica zeolite in Japan. A new production facility, located within the premises of SDK's Higashinagahara Plant in Aizu-Wakamatsu City, Fukushima Prefecture, will start commercial operation by the end of 2014. High silica zeolite is a kind of synthetic zeolite used as adsorbent, and is effective in removing volatile organic compounds (VOCs) and odor. The material is in tight supply due to a globally growing demand for various applications, including environmental protection, energy conservation, and household commodities. USKK intends to ensure stable supply of the product to customers, especially in such growing markets as Japan and Asian countries, develop new applications, and improve technical services. USKK is currently producing synthetic zeolite at its Yokkaichi Plant in Mie Prefecture, for such applications as dehydration, drying, refining, and separation. After the completion of the new plant, USKK will fully utilize these two plants, aiming to develop and supply new nuclear-waste-remediation products for treatment of contaminated water at Fukushima Daiichi nuclear power plant, decontamination in wide areas, and for treatment of radioactive nuclides to promote decommissioning of nuclear reactors.

Topics

[Electronics segment]

- **Completion of plant growth facility in Fukushima using SDK's specialty LED chips**

  In April, a new plant growth facility was completed at Kawauchi Village, Fukushima Prefecture, in which SDK's specialty LED chips and innovative cultivation method (the "*Shigyo* method™") are used. The facility represents a completely closed system cut off from the outside air and insects, enabling agricultural production uninfluenced by changes in weather and atmospheric temperature. The facility has the capability to produce up to 8,000 heads of leaf lettuce and green herbs. The facility uses SDK's LED chips that emit red light with optimized wavelengths for plant growth (660nm) in the highest brightness in the world (SDK estimates, as of April 2013) in combination with the "*Shigyo* method™", which was developed jointly by SDK and Yamaguchi University. Compared with fluorescent-lamp-based plant growth facilities, this system can increase the yield by two times or more, and reduce air-conditioning-related electricity costs, as it involves lower level of heat generation. Thus, the new system enables profitable operation of plant growth facilities.

- **Commercial production of 2.5" 670 GB HD media**

  In November, SDK started commercial production of 2.5-inch HD media with storage capacity of 670 gigabytes per disk, using the seventh-generation perpendicular magnetic recording (PMR) technology. To the best of our knowledge, the new 2.5-inch HD media had the world's highest storage capacity for this size available on the market as of November 2013. While the sixth-generation PMR media (500GB per disk) are now the main products, SDK will take the lead in commercializing higher-capacity media with the launch of the seventh-generation media.

Topics

[Electronics segment]

- **Development of Dy-free magnetic alloy for factory automation**

SDK developed and started commercial production of a new grade of neodymium-based magnetic alloy for factory automation (FA) applications, which alloy does not contain dysprosium (element symbol: Dy) but gives the same performance as conventional products. As the magnetic force of magnets declines in proportion to the rise in temperature, Dy is usually added to neodymium-based magnets to increase heat resistance. While SDK has already commercialized Dy-free magnetic alloys for HDD voice coil motor and wind-power generation motor applications, the company this time developed a new Dy-free magnetic alloy for FA applications, in which higher levels of Dy is usually added. The new technology will enable SDK to further reduce the levels of added Dy for more demanding applications such as electrically-assisted power steering and motors for electric vehicles. Based on the new technology, SDK is working to further reduce the levels of added Dy. In 2014, SDK will develop another new grade of Dy-free magnetic alloy that gives the same performance as conventional products in which 6% by weight of Dy is added. Thus, SDK will continue contributing toward further energy conservation.

[Inorganics segment]

- **Establishment of graphite electrode subsidiary in China**

SDK completed its procedure for acquiring a controlling stake in Sinosteel Sichuan Carbon Co., Ltd., a manufacturer of graphite electrodes in China. In March, SDK made the company a subsidiary, renaming it as Showa Denko Sichuan Carbon Inc. SDK has so far been supplying high-quality graphite electrodes mainly to the markets in advanced countries from its production sites, one each in Japan and the United States. With the establishment of its Chinese subsidiary, SDK is now ready to supply “volume-zone” products for emerging markets. Thus, SDK will steadily promote its strategy of “being active on two fronts,” serving both the high-end and volume-zone product markets.

Topics

[Inorganics segment]

- Commencement of a trial run at a chemical alumina plant in Indonesia

In October, a trial run started at a new 300,000t/y chemical alumina plant jointly constructed by SDK and ANTAM in the Tayan District, West Kalimantan, Indonesia. Commercial production and sales are scheduled to start in the second half of 2014. "Chemical alumina" refers collectively to aluminum hydroxide and alumina for applications other than aluminum smelting. Chemical alumina is used for various industrial applications, including chemicals for water treatment, refractories, abrasives, building materials, IC packaging, and materials for LCD glass. SDK has already decided to withdraw from the chemical alumina production in Yokohama. With the transfer of the alumina production technology built up over many years' operation of its Yokohama Plant to the new plant in Indonesia, SDK will establish a supply system to meet the growing demand in Southeast Asia and aim to further expand the business.

[Aluminum segment]

- Acquisition of aluminum can maker in Vietnam

In January 2014, SDK and its wholly owned subsidiary Showa Aluminum Can Corporation (SAC) reached agreement with major shareholders of Rexam-Hanacans Joint Stock Company (Hanacans), of Vietnam, to acquire 91.75% of shares in the company. Hanacans is manufacturing and selling aluminum beverage cans in Vietnam. The Japanese market for beverage cans has matured, offering no prospect of major growth. On the other hand, the emerging markets in China and Southeast Asia are expected to grow at high rates, reflecting the increases in population and income level. In particular, Vietnam has the highest beer consumption in Southeast Asia. Beer consumption in Vietnam is expected to grow rapidly, surpassing the current level in Japan by 2018. In addition to its solid customer base, Hanacans will introduce SAC's production technology and process control know-how to further strengthen its competitive power in the Vietnamese market.

Topics

[Aluminum segment]

- **Completion of high-purity aluminum foil plant in China**

  SDK completed a new plant in Nantong City, Jiangsu Province, China, for producing high-purity aluminum foil for electrolytic capacitors. Showa Denko Aluminum (Nantong) Co., Ltd., SDK's subsidiary established in November 2011, began commercial production at the new plant in November 2013. Unlike aluminum foil for food packaging, the production of capacitor-grade aluminum foil is based on high-purity aluminum metal refined to 99.9% or more. SDK's Sakai Plant, in Osaka Prefecture, is an integrated high-purity aluminum foil production site, covering all stages from refinement of aluminum metal to rolling and finishing. The new plant in Nantong City processes rolled foil supplied from the Sakai Plant into finished product, providing high-purity aluminum foil to customers in all parts of China in a timely manner. Aluminum electrolytic capacitors are used in wide areas, including electric appliances, IT devices, electric vehicles, hybrid cars, and equipment for wind/solar power generation. In particular, a rapid growth is expected for such applications as environment-friendly cars and power conditioners for solar power generation. The Showa Denko Group will aim to expand the business in Japan and the Asian market, centering on China, by ensuring stable supply of high-quality, high-purity aluminum foil.

- **Receipt of METI Minister's Prize in 3Rs Promotion Merit Awards**

  SDK received the Minister of Economy, Trade and Industry's Prize in the Reduce, Reuse and Recycle Promotion Merit Awards (3Rs Promotion Merit Awards) for fiscal 2013. The prize was awarded to commend the Showa Denko Group's aluminum can recycling activity that has been promoted by all employees of the Group for more than 40 years. While the activity was started as a voluntary program by employees, the Group's various operation sites now conduct aluminum can recycling together with residents of local communities. The earnings from the collected aluminum cans are donated to local social welfare councils, year-end charity campaign and circles for handicapped persons, and utilized for welfare activities of local communities.

Topics

[Others]

- Increasing LIB packaging material production capacity

  Showa Denko Packaging Co., Ltd., a subsidiary of SDK, decided to further increase its production capacity for LIB-packaging aluminum laminated films, in addition to the expansion already completed in July 2013. After the additional expansion, Showa Denko Packaging's production capacity at the end of 2014 will be increased by three times before the expansions. Showa Denko Packaging is offering its aluminum laminated film—a composite material of resin film and aluminum foil—for packaging LIBs. Compared with metallic LIBs (such as cylindrical type), aluminum-laminated-film-based pouch type LIBs provide higher flexibility in molding, lighter weight, and better heat dissipation. Thus, the share of pouch type is increasing, and the market for LIB-packaging aluminum laminated films is expected to grow rapidly.