

FY2016 1st Half Results

(from April 1, 2016 to September 30, 2016)

October 31, 2016



NGK INSULATORS, LTD.

This is a translation of materials used for the analyst meeting held in Tokyo, Japan on October 31, 2016

This document contains forward-looking statements that are based on management's expectations, estimates, projection and assumptions that were available and reasonable at the time of release. Actual future results and trends may differ materially from those in the forecasts due to a variety of factors.

Agenda

Summary of financial results for FY2016 1st Half

(Ended September 30, 2016)

Forecast for FY2016

(Ending March 31, 2017)

Segment Information

Capital Expenditures & Depreciation Costs

Medium-term Plan / New products / R&D

Priority Tasks

Financial Condition

	(¥Bil.)	FY2015 1 st half	April announcement	FY2016 1 st half	Growth ratio
Net Sales		210.6	200.0	194.3	FX -12.2 -8%
Operating Income		41.3	33.0	34.3	-3.6 -17%
Ordinary Income		40.3	32.0	32.4	-20%
Profit Attributable to Owners of Parent		27.5	22.0	21.7	-21%
Exchange Rate	USD	¥122	(¥108)	¥106	-¥16
	EUR	¥135	(¥120)	¥119	-¥16

Sales and income lower than the same period last year

- Power Loss recorded for both insulators and NAS® batteries.
- Ceramics Sales of passenger cars were robust in China, Europe, and the U.S., and demand for honeycomb filters and sensors increased, but sales decreased due to a stronger yen. Income levelled off due to the effects of increased production volume and turning around industrial processes to profitability.
- Electronics Both sales and income decreased due to weak demand for package products as a result of delayed investment for mobile phone base stations in China, in addition to the effects of the stronger yen.
- Extraordinary losses Impairment loss on non-current assets of ¥3.2 billion was posted.

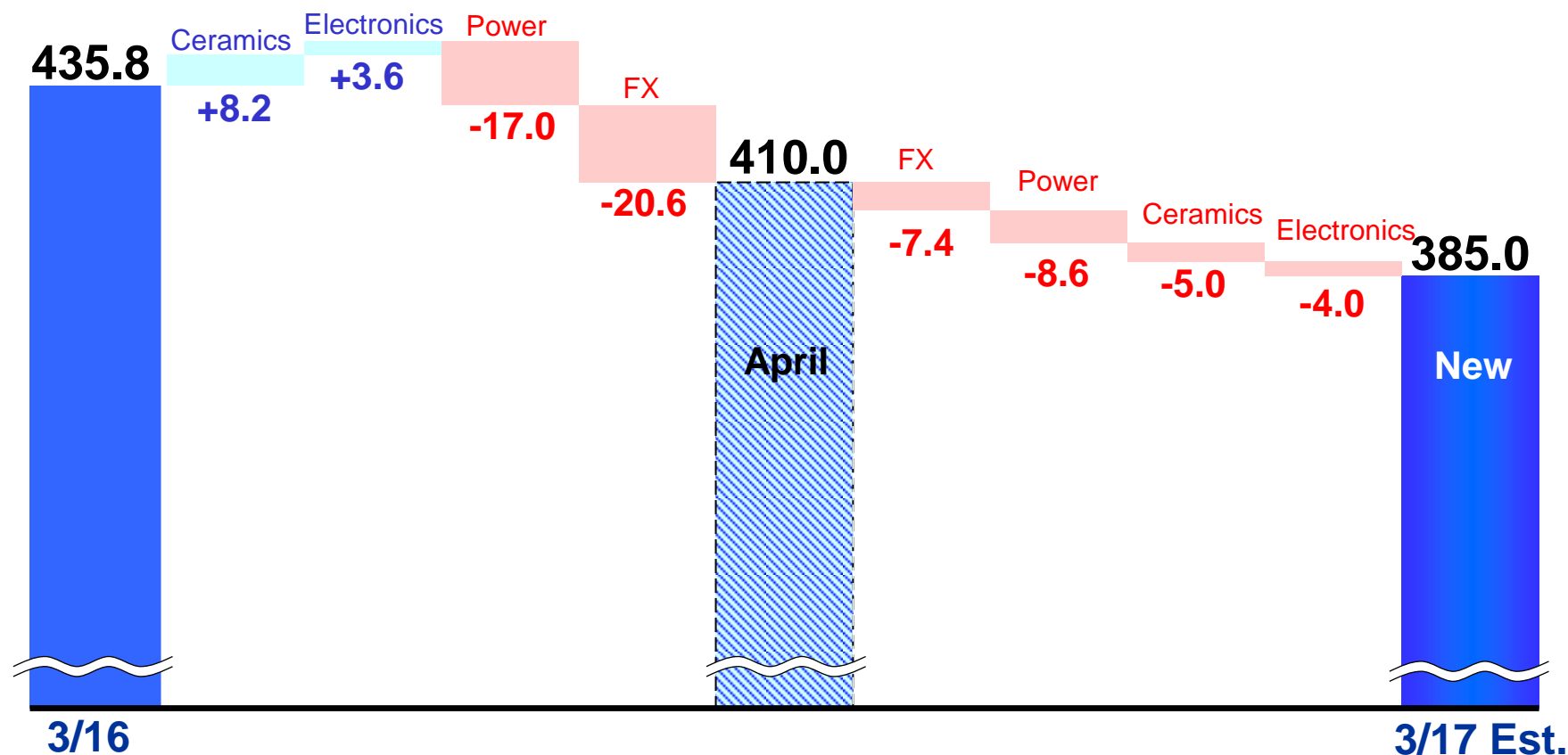
Forecasts for FY 2016

	(¥ Bil.)	FY2015	FY2016		Growth ratio
			April announcement		
Net Sales		435.8	410.0	385.0	-12%
Operating Income		80.9	60.0	54.0	-33%
Ordinary Income		81.5	63.0	54.0	-34%
Profit Attributable to Owners of Parent		53.3	44.0	33.0	-38%
Exchange Rate	USD	¥120	(¥108)	¥103	-¥17
	EUR	¥132	(¥120)	¥115	-¥17

Lower sales and income forecasts compared with the same period last year

- Power** Sales and income are forecast to fall significantly below initial projections due to the postponement of parts of orders for overseas projects in the insulators business and weak shipments of NAS® batteries.
- Ceramics** Sales of passenger cars are forecast to remain strong in China, Europe, and the U.S., and demand is projected to be robust, notably for honeycomb filters. Meanwhile, sales are forecast to decrease from the estimate made in April due to the effects of the stronger yen.
- Electronics** Sales and income are forecast to decrease due to the effects of the stronger yen and a delay in the recovery of demand for package products, although demand for ceramics components for semiconductor manufacturing equipment is forecast to be strong.

Change Analysis: Sales



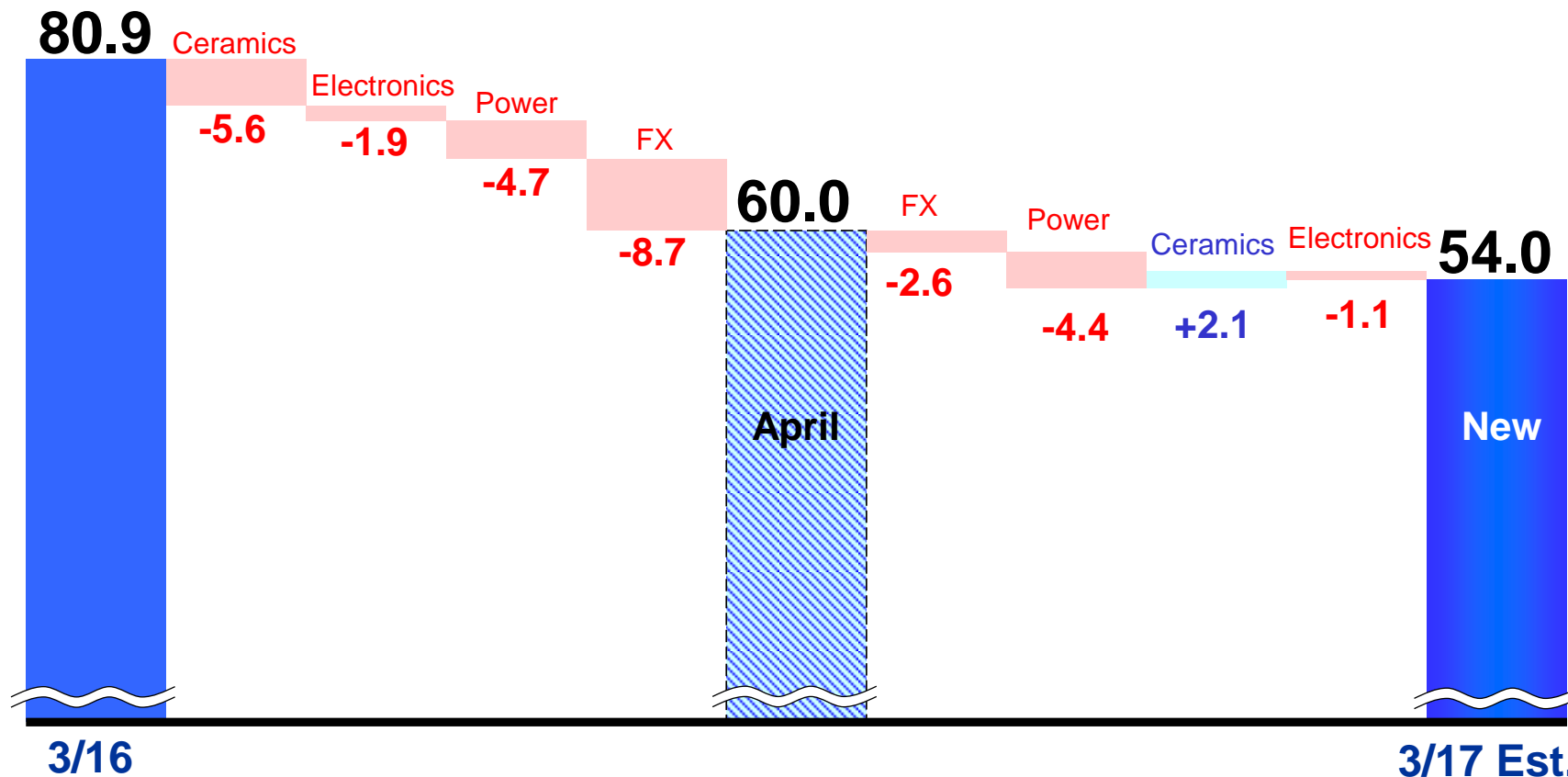
FX Rate 3/16
¥120/USD
¥132/EUR

April(3/17 Est.)
¥108/USD
¥120/EUR

New(3/17 Est.)
¥103/USD
¥115/EUR

Change Analysis: Operating Income

(¥ Bil.)

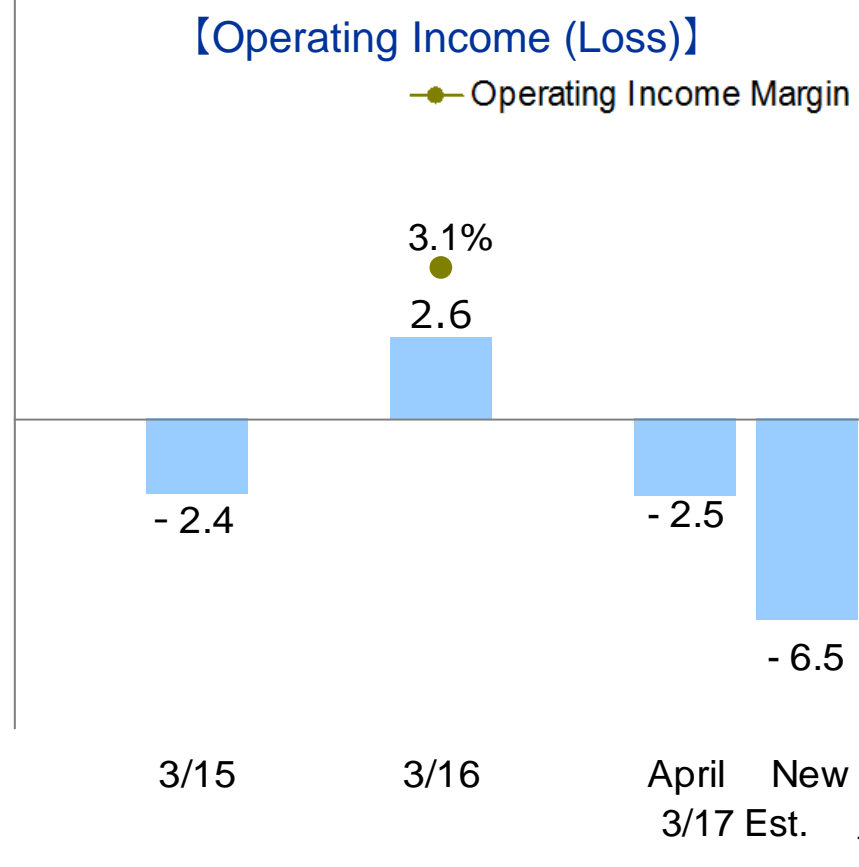
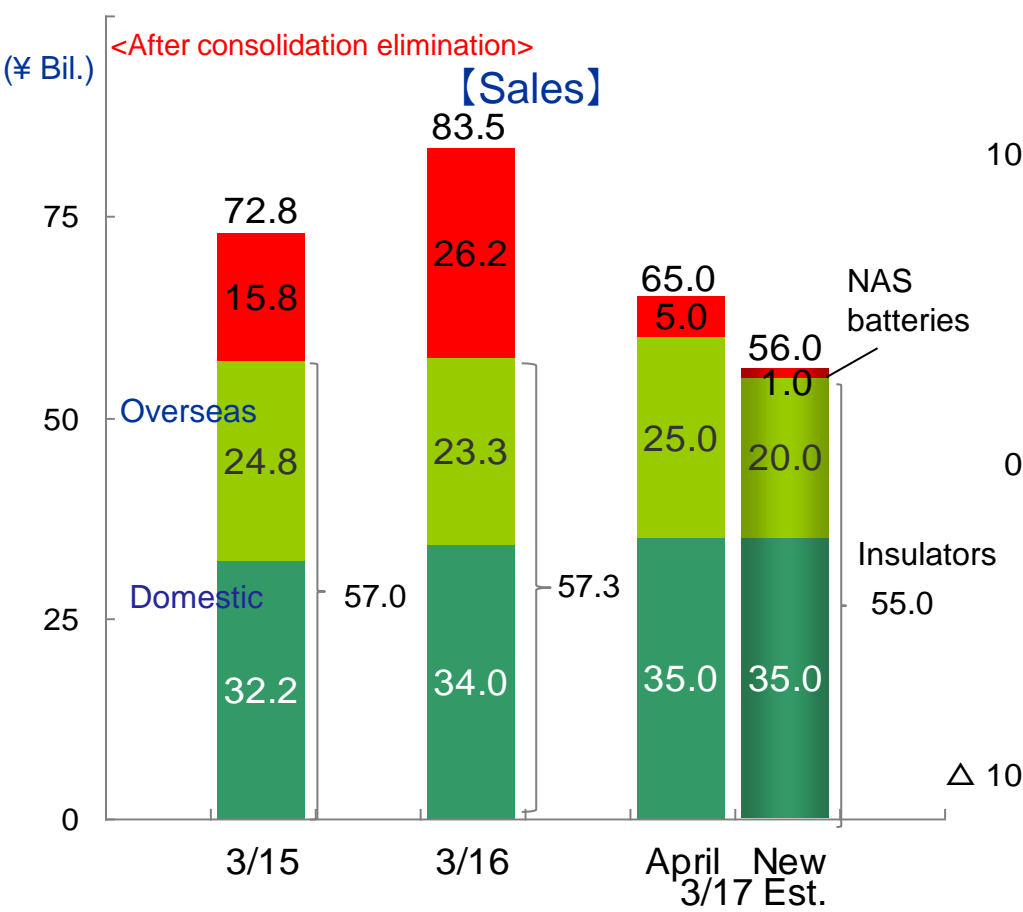


FX Rate 3/16
¥120/USD
¥132/EUR

April(3/17 Est.)
¥108/USD
¥120/EUR

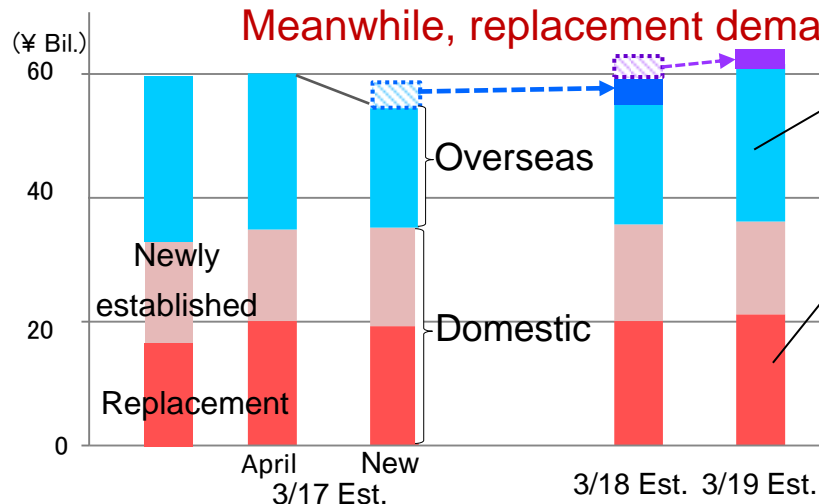
New(3/17 Est.)
¥103/USD
¥115/EUR

- Insulators
 - Expected to make a loss due to factors including delays in large-scale projects in Asia and the Middle East and weak demand in North America.
 - Continue to stimulate replacement demand for insulators in Japan and develop production systems that can respond to changes in demand.
 - NAS
 - Loss is expected to increase due to the effects of delayed projects in Japan and overseas.
 - Demand for NAS batteries for long-time use, the key feature of NAS batteries, is still limited; therefore, demand is expected to remain weak for the time being.
- Streamline the business operation system with the aim of minimizing losses.



■ Insulators Overseas projects will be postponed until next year or beyond.

Meanwhile, replacement demand in Japan is forecast to remain robust.



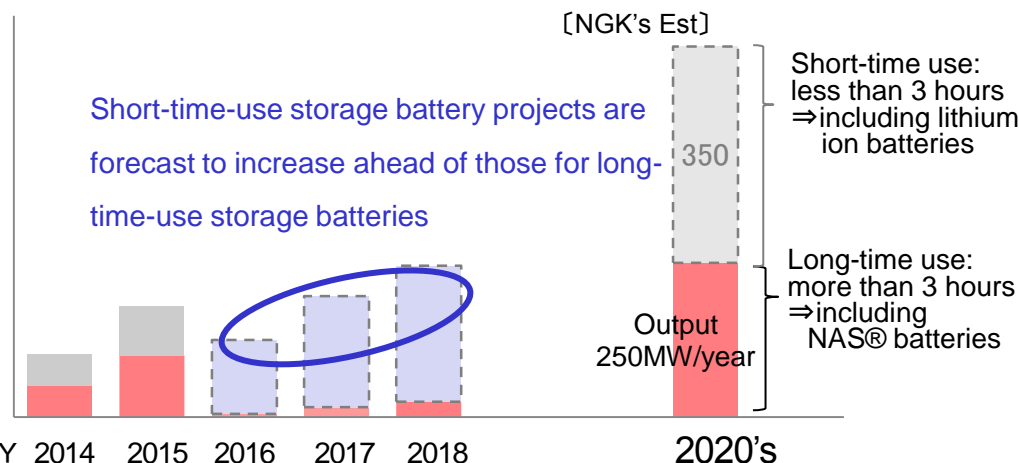
Overseas: There have been delays in parts of large-scale projects in Asia and the Middle East due to factors including a shortage of funds resulting from low crude oil prices.

Japan: Replacement demand for insulators installed during or after the high economic growth period is forecast to be robust.

- Stimulate and capture domestic replacement demand.
- Develop an efficient production system that responds to changes in demand.

■ NAS® Batteries Demand for long-time use is expected to be weak for the time being.

<Global market scale for large-scale storage batteries>



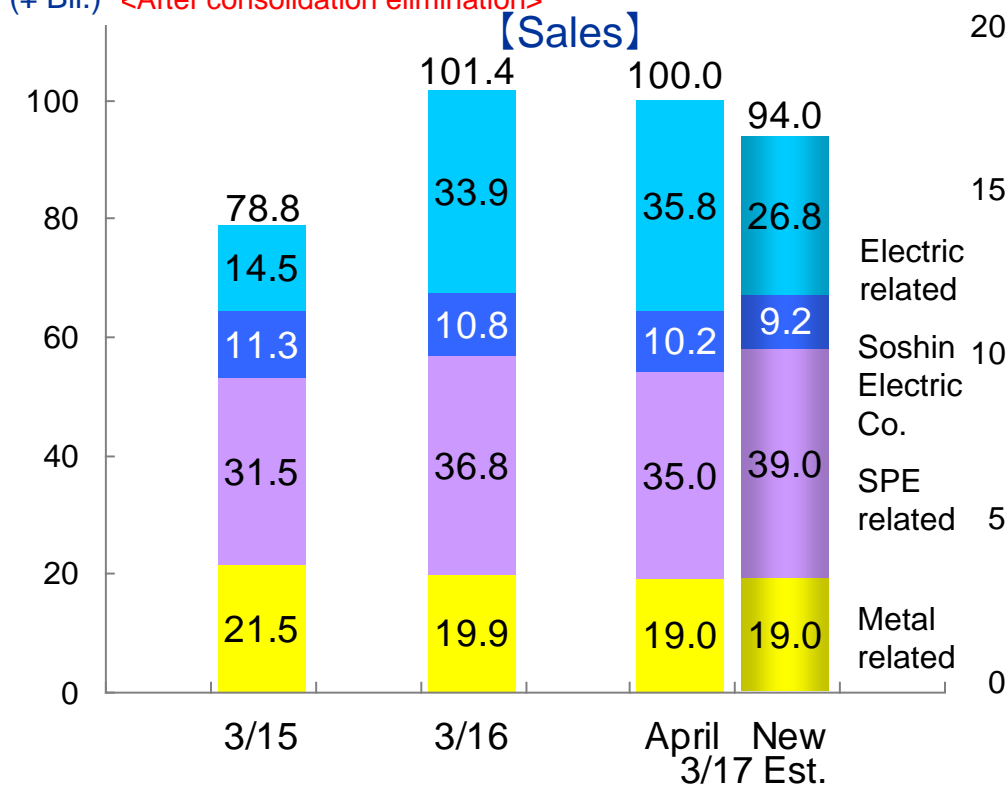
- Demand for storage batteries is expected to increase due to increased introduction of renewable energy, but demand for storage batteries for short-time use such as lithium ion batteries is projected to increase first.

- Streamline business operation to prepare for a slowdown in operations for the time being.
- Aim to capture demand by working together with local partners in each region

- Electronics Components
 - Recovery of demand for package products has been held back due to delayed investment in mobile phone base stations in China.
 - Aim to recover profitability by steadily achieving cost reductions.
- Ceramics for Semiconductor Manufacturing Equipment (SPE-related products)
 - Investment for multi-layering by semiconductor manufacturers remained high and demand grew against the backdrop of increased demand for semiconductors for data centers.
 - Make advance investments to expand capacity in order to respond to a growth in demand.
- Metal Related Products
 - Near-term demand is on a recovery trend. Aim to expand business by promoting development of new materials and products with new applications.

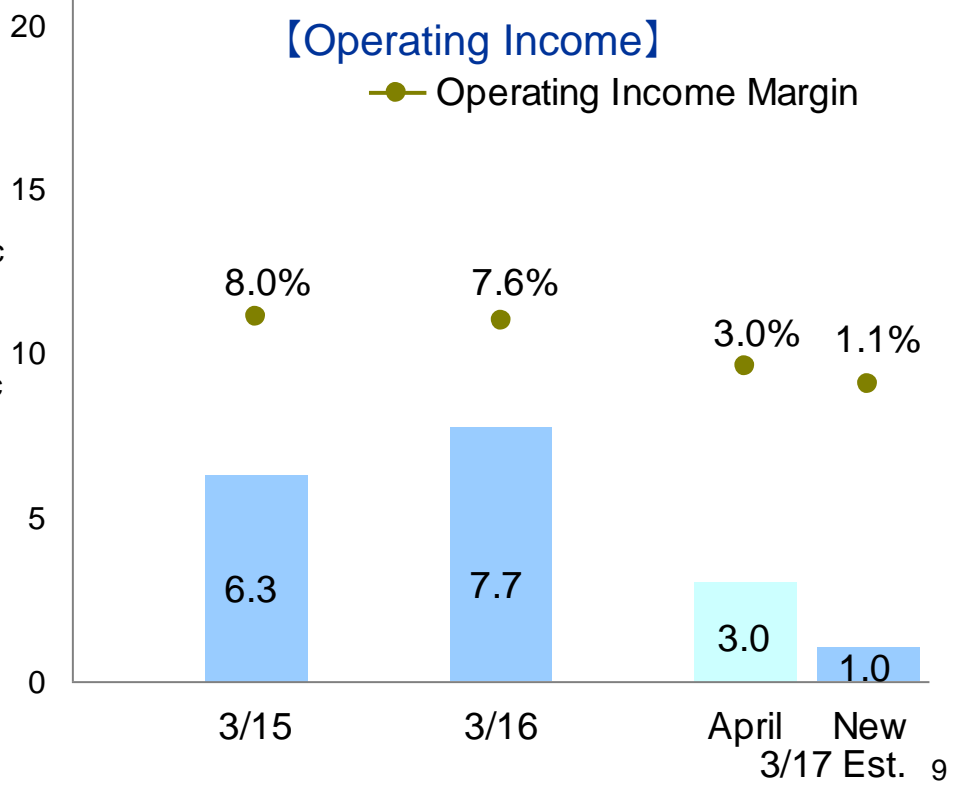
(¥ Bil.) <After consolidation elimination>

【Sales】



【Operating Income】

—●— Operating Income Margin



■ Ceramic Components for Semiconductor Manufacturing Equipment

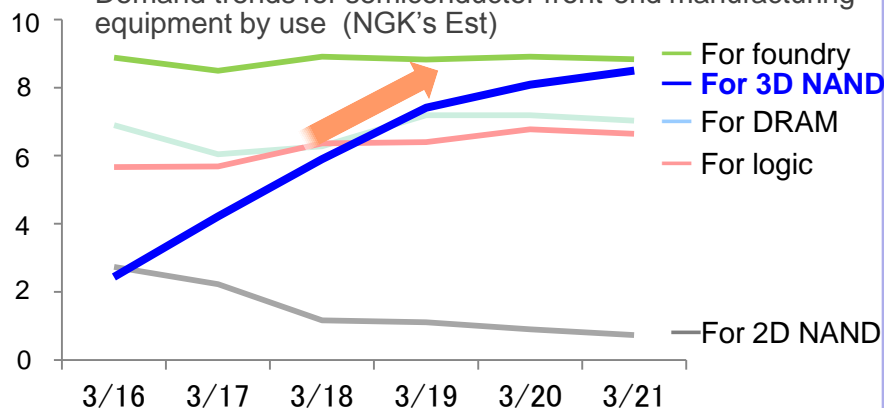


Investment related to 3D-NAND flash memories is forecast to increase against the backdrop of brisk demand for mobile devices and memory devices including data servers.

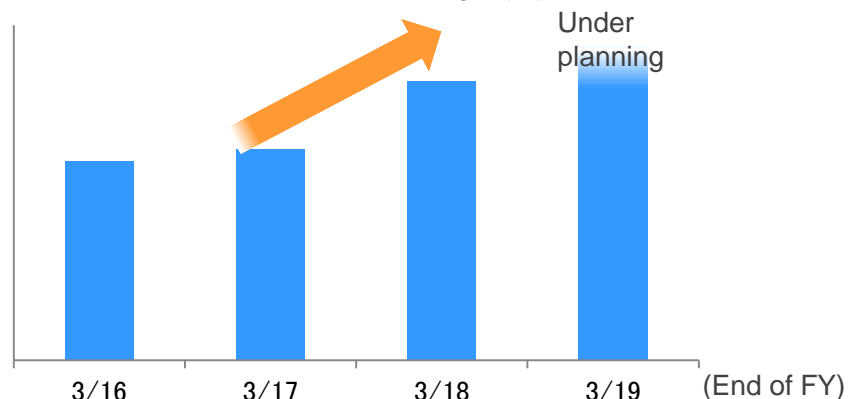
Demand for semiconductor manufacturing equipment is forecast to grow.

(\$ Bil.)

Demand trends for semiconductor front-end manufacturing equipment by use (NGK's Est)



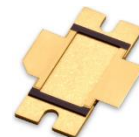
NGK Insulators' production capacity for ceramics products for semiconductor manufacturing equipment



Aggressively invest in increased production to certainly capture increased demand

■ Ceramic Package Business (Electronics Components)

RF package



- Distribution inventory will be in adjustment phase temporarily due to delayed infrastructure investments for mobile phone base stations in China.
- With the diffusion of LTE, infrastructure development will progress in emerging nations and demand will be robust in the medium term.

Quartz crystal package



- Although the growth in the overall smartphone market will be sluggish, demand is forecast to expand against the backdrop of an increase in highly functional products.

Aim to accelerate the strengthening of profitability of existing businesses and development of new products to expand business domain.

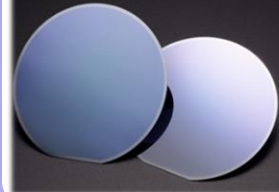
■ Wafer Products

(Electronics Components)

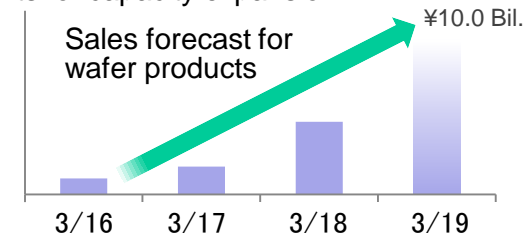
Bonded wafers for SAW filters

- Demand for NGK's composite wafers is expected to grow for use in high-functionality SAW filters as a result of a shift to multiband following increases in the speed and capacity of mobile communication.
- Make advance investments for capacity expansion.

NGK's bonded wafers



Sales forecast for wafer products

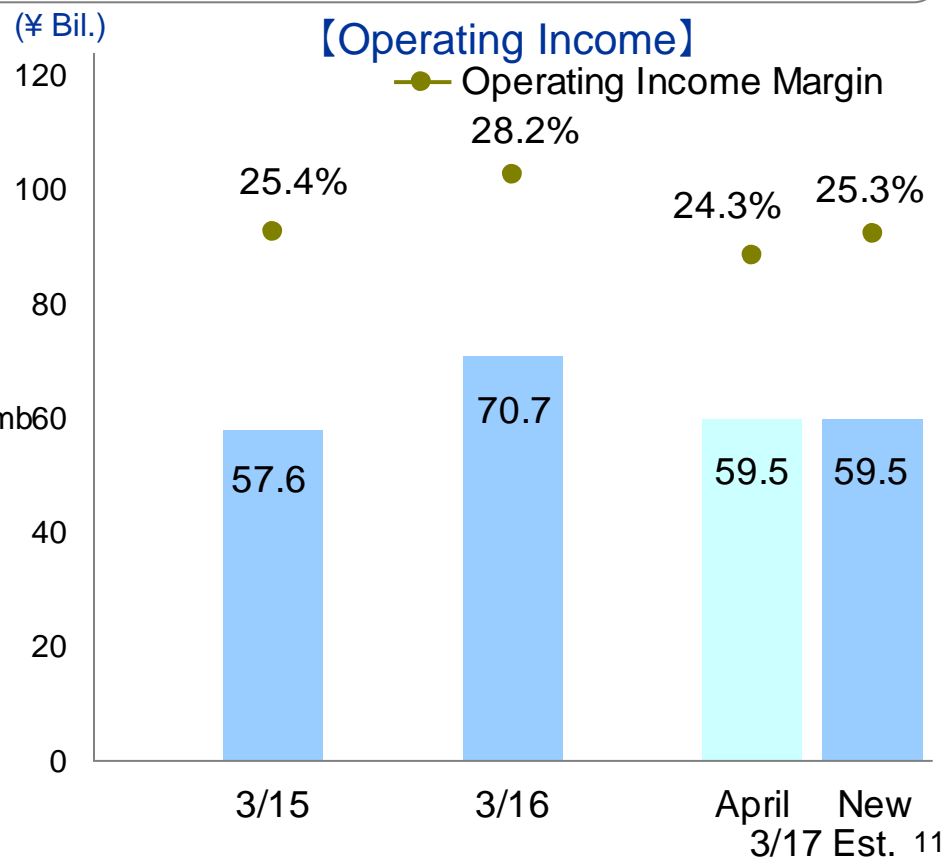
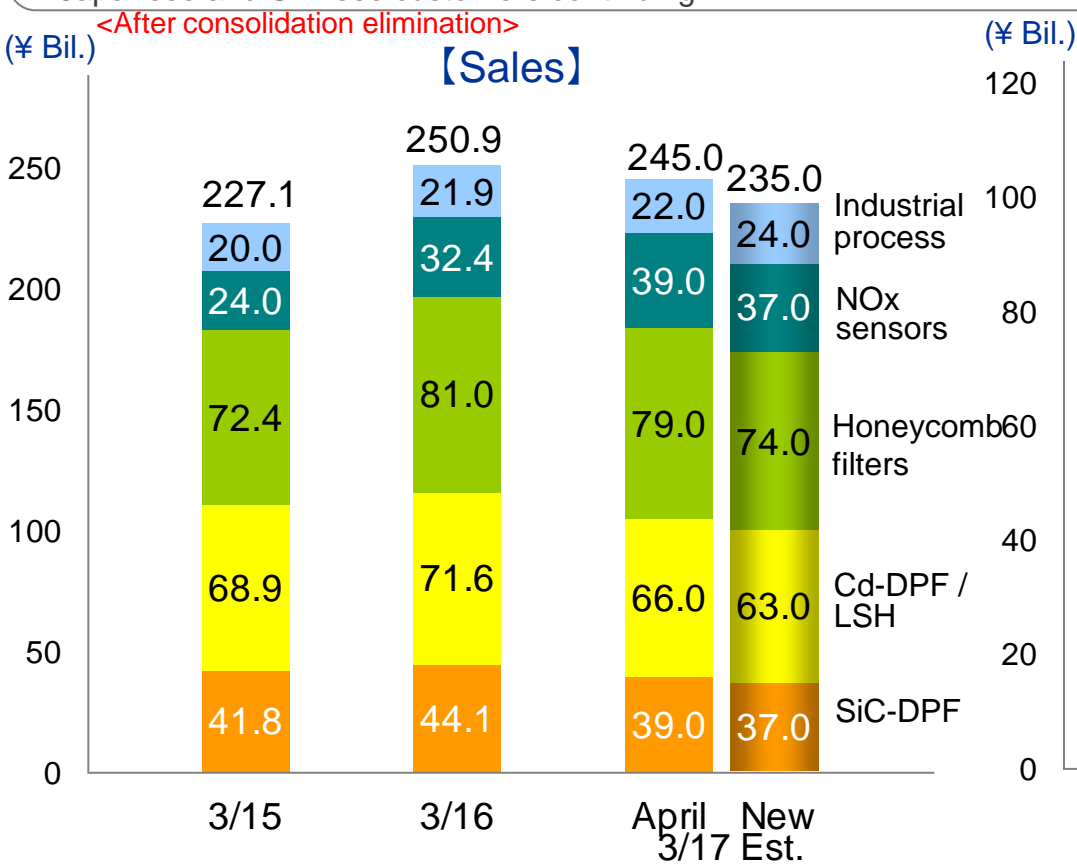


●Automotive-related

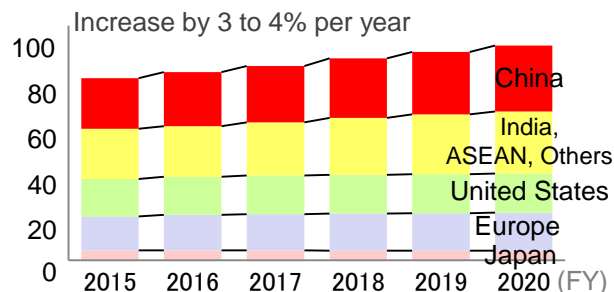
- Demand for honeycomb filters expanded as a result of continued strong sales of passenger cars in China, Europe, and the U.S.
 - Truck sales in China and Europe were in line with initial projections, and demand for LSH/Cd-DPF was robust.
 - Demand is expected to remain robust for NOx sensors due to the expanded application of regulations.
 - The Ceramics Business is expected to expand due to a continuing global trend toward tighter emission regulations in the medium and long term.
- Continue to focus on developing a global production system.

●Industrial processes

- Both sales and income increased due to strong demand for kiln-related products with lithium battery-related investments by Japanese and Chinese customers continuing.

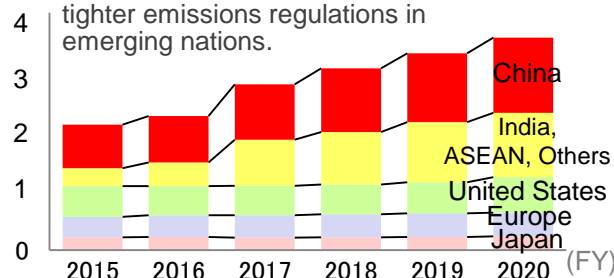


■ Sales of passenger cars (mil. cars)



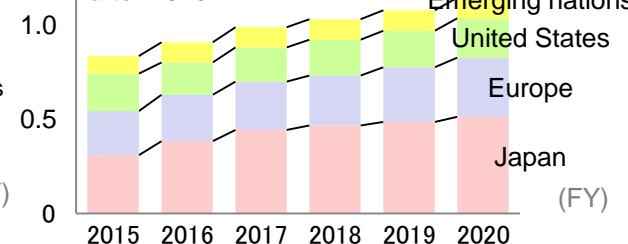
■ Trucks requiring after-treatment (mil. trucks)

Number of trucks requiring after-treatment will rise due to increased sales in China and tighter emissions regulations in emerging nations.



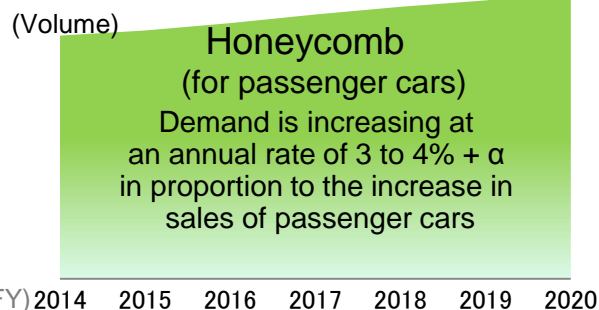
■ Off-roads requiring after-treatment (mil. cars)

Tightening of regulations, mainly in developed countries. Full-scale demand also in emerging nations after 2020.

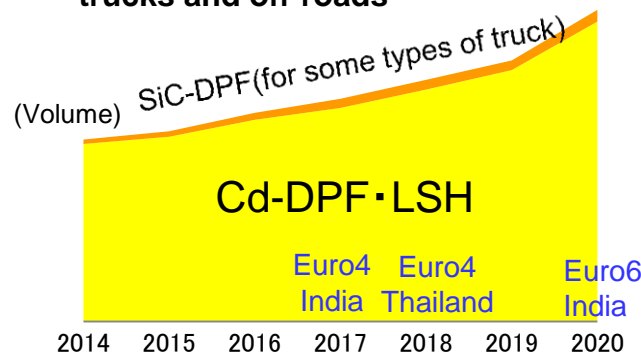


<Total demand forecast for products>

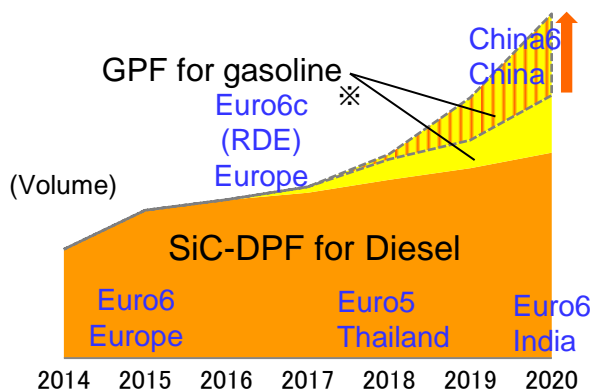
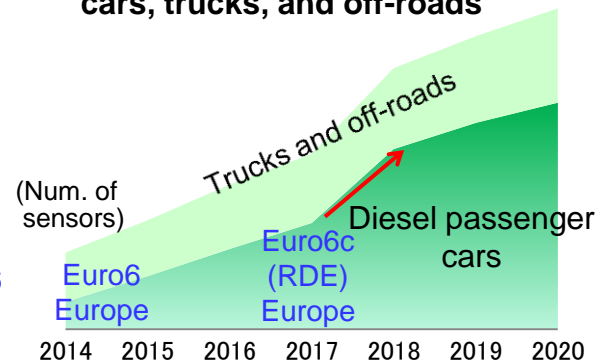
■ Honeycomb, GPF, SiC-DPF for passenger cars



■ LSH, Cd-DPF, SiC-DPF for trucks and off-roads



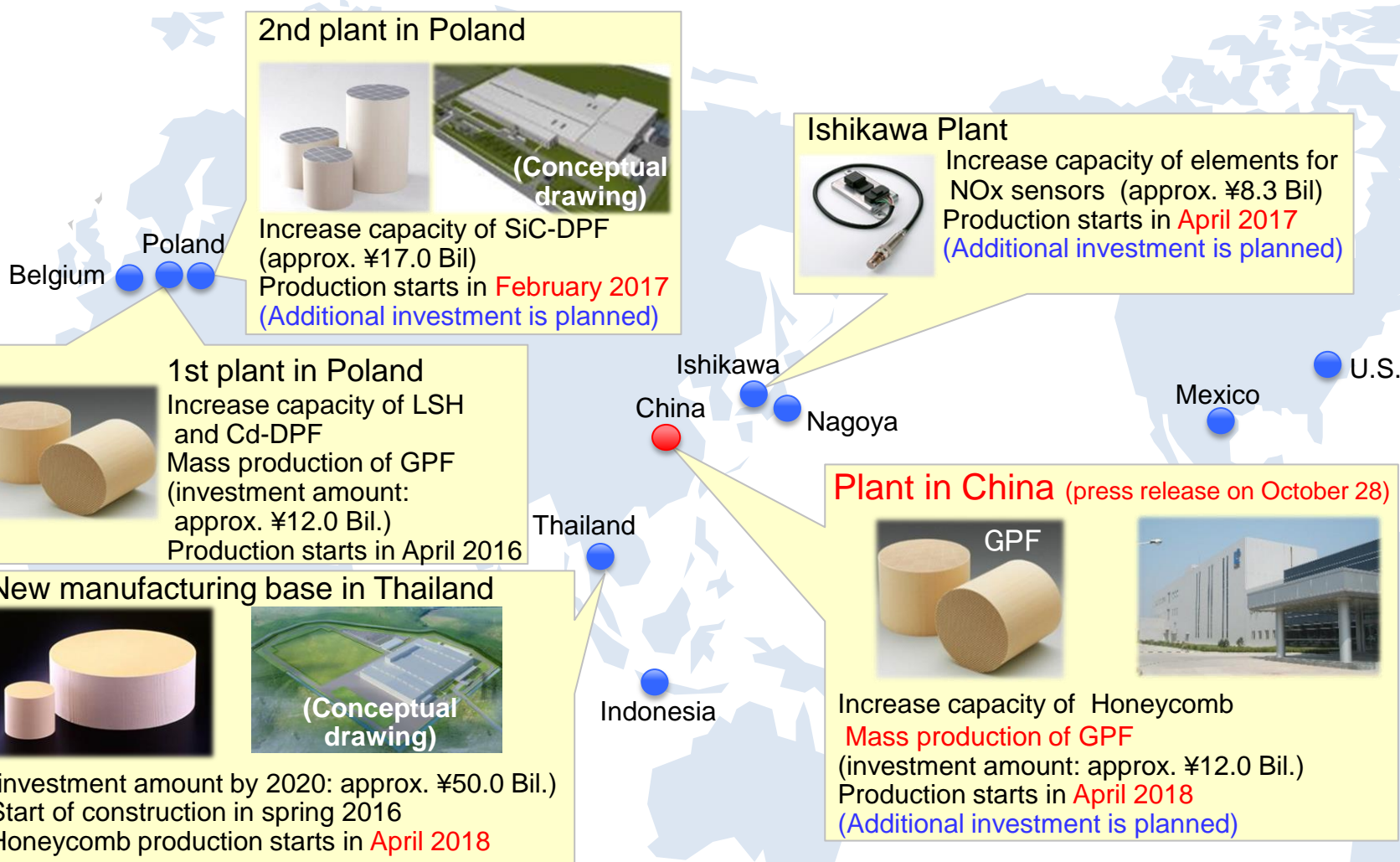
■ NOx sensor for diesel passenger cars, trucks, and off-roads



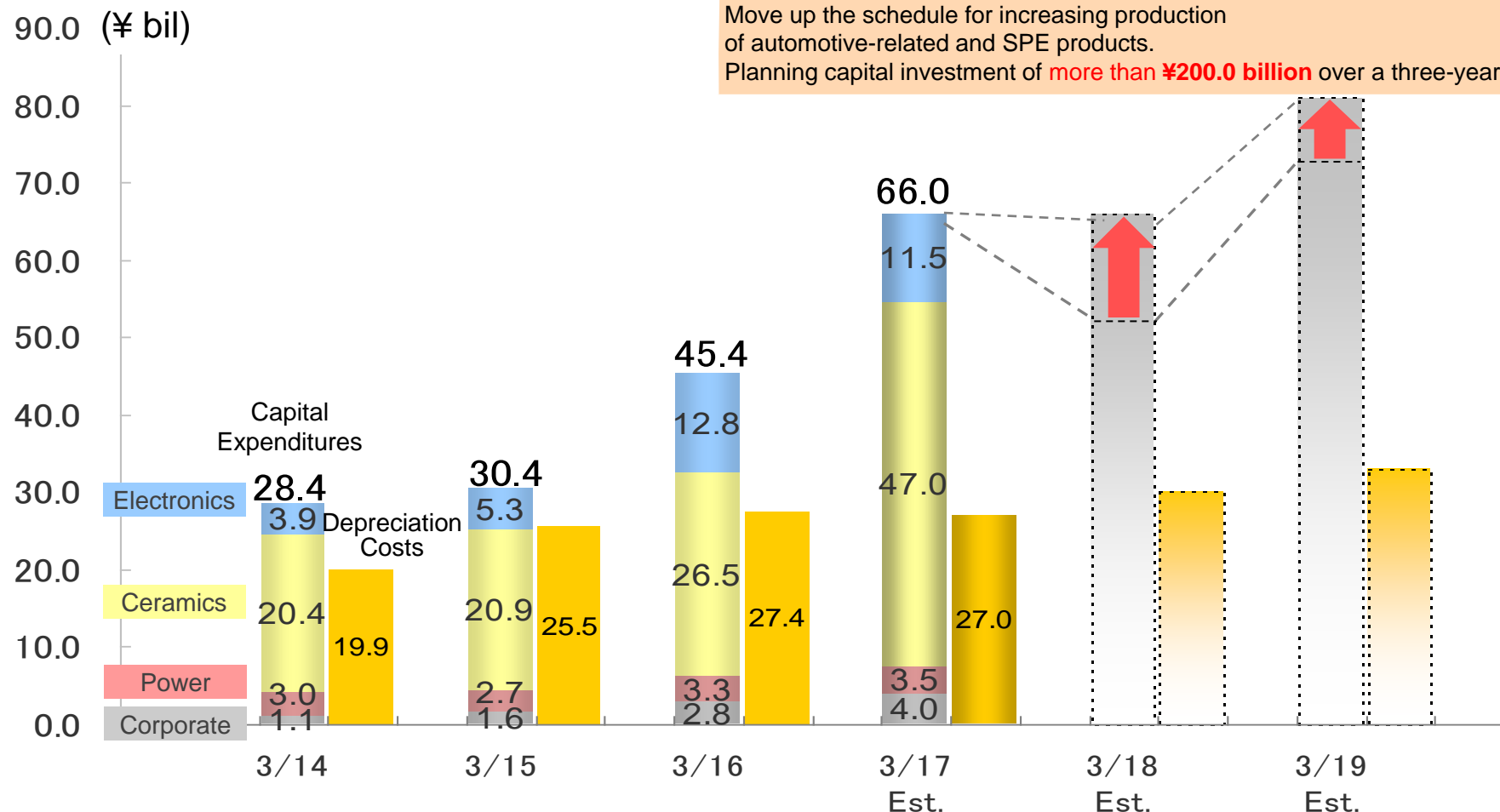
- Demand for **GPF** and **NOx sensors** is expected to grow from around 2018 as a result of the introduction of new regulations including real driving emissions (RDE) and particulate number (PN) regulations in Europe.

- Demand for GPF is expected to grow further due to an increase in installations of GPF as a result of moving up the implementation schedule of China 6 standards to 2020 and a tightening of regulations.

*GPF (Gasoline Particulate Filter)



Decided to boost production of honeycomb filters and start **mass-production of GPF** at the **plant in China** in response to moving up the implementation schedule and tightening of emission regulations in emerging nations. In addition, also promote further expansion of capacity at other manufacturing bases.



2nd plant in Poland: ¥17.0 Bil.
(SiC-DPF)

Production starts in
February 2017

Additional investment is planned

Ishikawa Plant: ¥8.3 Bil.
(NOx sensor)

Production starts in April 2017

Additional investment is planned

New manufacturing base in Thailand: ¥50.0 Bil.
(Honeycomb, etc.)

Honeycomb production starts in April 2018
Range of products manufactured will expand
in line with phased investments by 2020

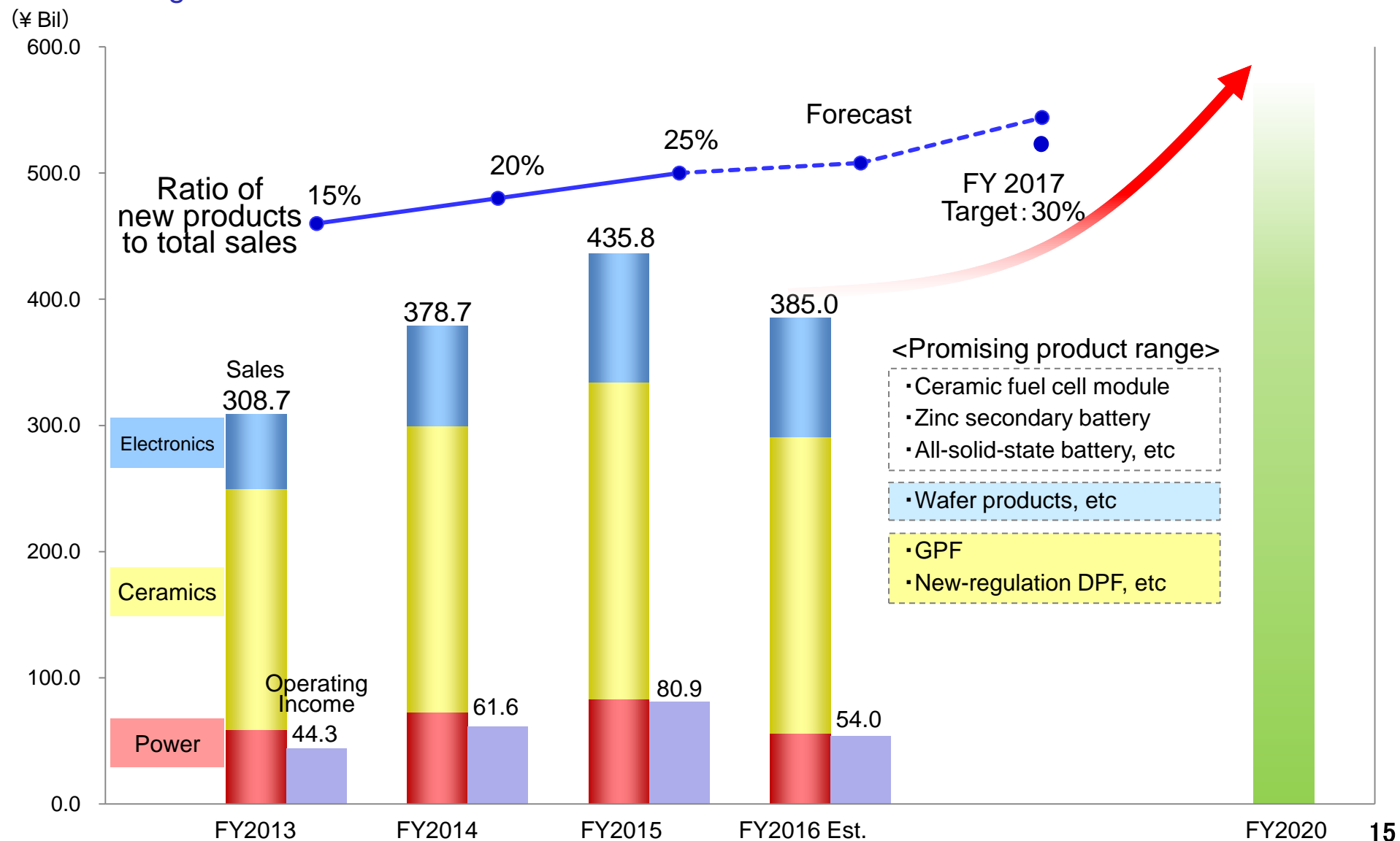
Plant in China: ¥12.0 billion
(Honeycomb/GPF)

April 2018 Start GPF production

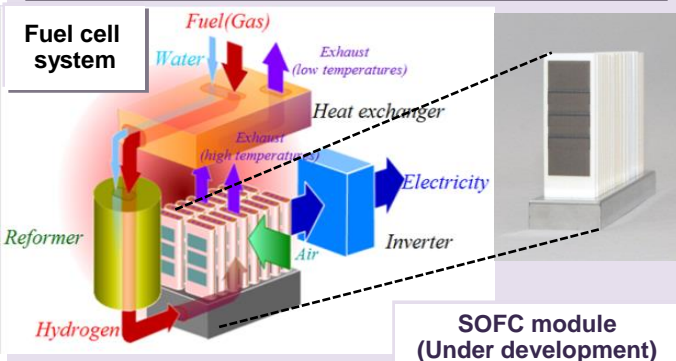
Additional investment is planned

Medium-term Plan / Ratio of new products to total sales

Forecast to achieve target ratio of new products to total sales in FY2017.
Reinforce existing products and tackle the rapid commercialization of new products to ensure continuous growth.



Ceramic fuel cell module SOFC (Solid-Oxide Fuel Cell) module



- Compact but highly efficient and durable power generation component made of ceramic enabled by proprietary configuration and ceramic material

Fuel cell system for a detached house and an apartment building
For next-generation fuel battery systems



- Being evaluated at major fuel cell system companies for commercialization

Zinc secondary battery

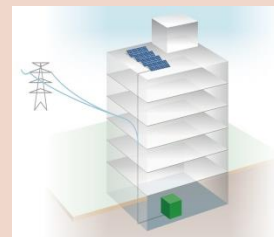


- Large capacity battery using proprietary OH ion-conducting ceramic materials in its separators
- Has high safety since it uses an aqueous electrolyte, and can be installed in various locations

Household-type storage battery (10kWh class)



Indoor-type storage battery (500kWh class)
For buildings, hospitals and commercial facilities, etc.



- Being evaluated for long-term durability, for commercialization in 2017

All-solid-state battery



- All-solid-state batteries that are ultra-slim, high energy, compact and operable under high temperatures

Wearable devices



Smart cards



IoT wireless modules



On board power unit

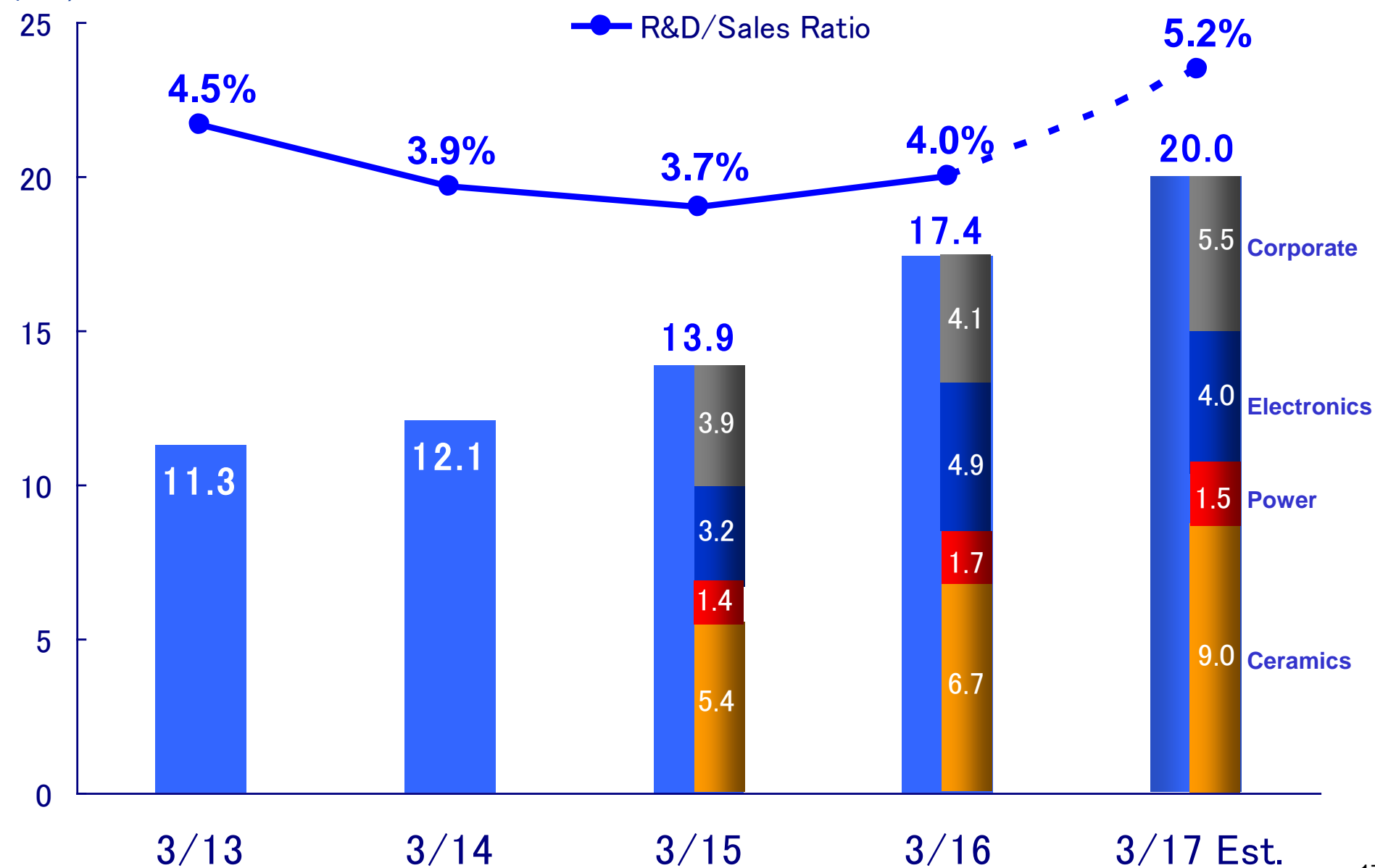


- Samples being evaluated at more than 10 companies
- Obtained accreditation for IEC62133 standards.

Company-wide cross-organizational “Ceramic Battery Project” currently underway

R&D Input

(¥ Bil.)



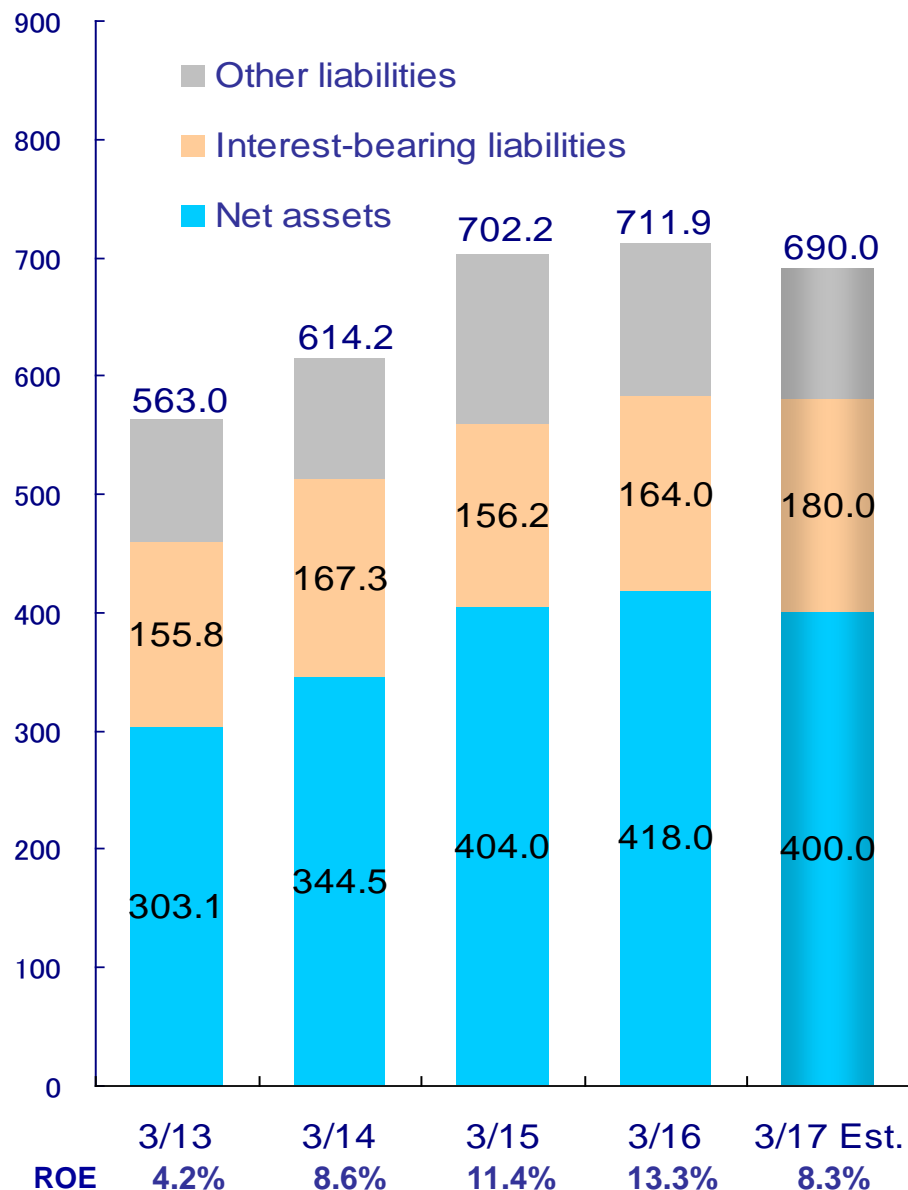


Summary of Cash Flows

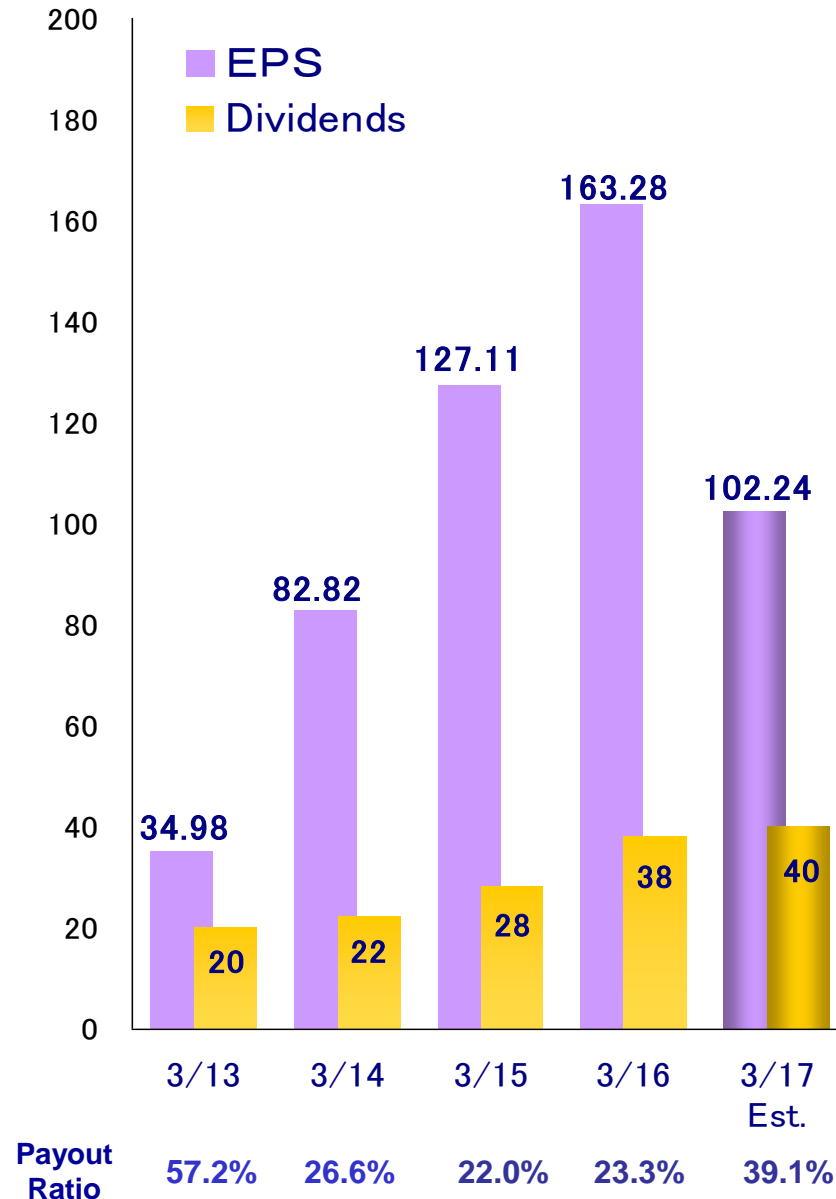
(¥ Bil.)

	3/15	3/16	3/17 Est.
Operating Activities	73.0	59.4	62.0
Investing Activities	-39.5	-47.8	-59.0
Financing Activities	-26.0 New loans +5.7 Repayment -21.9	-0.4 New loans +16.8 Repayment -6.7	-5.0 New loans +35.0 Repayment -19.0 Treasury stock purchase -11.2
Effect of Exchange Rate Changes on Cash & Cash Equivalents	1.3	-3.9	-8.0
Net Change in Cash & Cash Equivalents	8.8	7.4	-10.0
Cash & Cash Equivalents- at the End of Year	128.6	136.1	126.1

(¥ Bil.)



(¥)



Sales by Product (Annual)

<After Consolidation Elimination>

(¥ Bil.)

	3/14	3/15	3/16	3/17 Est.
Insulators	53.9	57.0	57.3	55.0
NAS	5.1	15.8	26.2	1.0
Power Business	59.0	72.8	83.5	56.0
Honeycomb filters	65.1	72.4	81.0	74.0
SiC-DPF	37.6	41.8	44.1	37.0
Cd-DPF / LSH	51.8	68.9	71.6	63.0
Sensors	16.4	24.0	32.4	37.0
Industrial Process	19.9	20.0	21.9	24.0
Ceramics Business	190.8	227.1	250.9	235.0
Metal related	18.6	21.5	19.9	19.0
SPE related	24.3	31.5	36.8	39.0
Electric Related	4.8	14.5	33.9	26.8
Soshin Electric Co.	11.2	11.3	10.8	9.2
Electronics Business	58.9	78.8	101.4	94.0
Total	308.7	378.7	435.8	385.0

Sales by Product (Semi Annual)

<After Consolidation Elimination>

(¥ Bil.)

	3/16		3/17 Est.	
	1 st Half	2 nd Half	1 st Half	2 nd Half
Insulators	27.9	29.4	26.0	29.0
NAS	5.9	20.3	0.4	0.6
Power Business	33.8	49.7	26.4	29.6
Honeycomb filters	39.1	41.8	39.0	35.0
SiC-DPF	22.1	22.0	19.4	17.6
Cd-DPF / LSH	37.0	34.6	33.1	29.9
Sensors	14.9	17.4	17.5	19.5
Industrial Process	9.6	12.3	10.4	13.6
Ceramics Business	122.7	128.1	119.4	115.6
Metal related	10.6	9.3	9.8	9.2
SPE related	18.7	18.2	20.5	18.5
Electric Related	19.5	14.4	13.7	13.1
Soshin Electric Co.	5.4	5.4	4.5	4.7
Electronics Business	54.1	47.4	48.5	45.5
Total	210.6	225.2	194.3	190.7

The purpose of this brief is information disclosure for better understanding of NGK Group's policies, projections and financial condition. This brief does not solicit buying and selling of NGK's shares.

The figures included in this brief, including the business performance targets and figures, are all projected data based on the information currently available to the NGK Group, and are subject to variable factors such as economic conditions, competitive environments and future demands.

Accordingly, please be advised that the actual results of business performance may differ substantially from the projections described here.



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