

FY2020 Results

(from April 1, 2020 to March 31, 2021)

April 28, 2021

This is a translation of materials used for the analyst meeting held online, Japan on April 28, 2021



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President
Shigeru Kobayashi



NGK INSULATORS

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.

Summary of Financial Results for FY2020

(Ended March 31, 2021)

Forecasts for FY2021

(Ending March 31, 2022)

Segment Information

Future Growth Business

Capital Expenditures & Depreciation Costs & R&D

Mid-term Targets (Performance/ROIC)

Financial Condition

(Capital Policy & Treasury Stock Purchase/

Summary of Cash Flow/Total Assets & Dividend)

FY2020 Consolidated Financial Results

	(¥Bil.)	FY2019	June announcement	March announcement	FY2020	Growth ratio
Net Sales		442.0	420.0	448.0	452.0	FX -1.9 +2%
Operating Income		55.0	30.0	49.0	50.8	-1.7 -8%
Ordinary Income		52.0	29.0	52.5	53.0	+2%
Profit Attributable to Owners of Parent		27.1 [※]	17.0	38.0	38.5	+42%
Exchange Rate	USD	¥109	(¥105)	(¥106)	¥106	-¥3
	EUR	¥121	(¥115)	(¥123)	¥124	+¥3

YOY Sales increased. Op. income decreased.
Ordinary income and profit attribute to owners of parent increased.

- Energy Infrastructure Demand for both Insulators and Energy Storage was weak, but the deficit decreased due to cost reduction.
- Ceramics Passenger car and truck sales rapidly recovered in the 2nd half, but they significantly reduced in the year due to the significant decrease in the 1st half. Sales and income declined due to the decrease in demand for automotive-related products.
- Electronics Sales declined due to a decrease in package demand for mobile phone base stations despite the higher demand for wafers and piezoceramic actuators for HDD. Income increased due to the deficit reduction by cost reduction.
- Process Technology Sales and income increased due to increase in demand by the strong Foundry investment and the recovery of Memory investment.

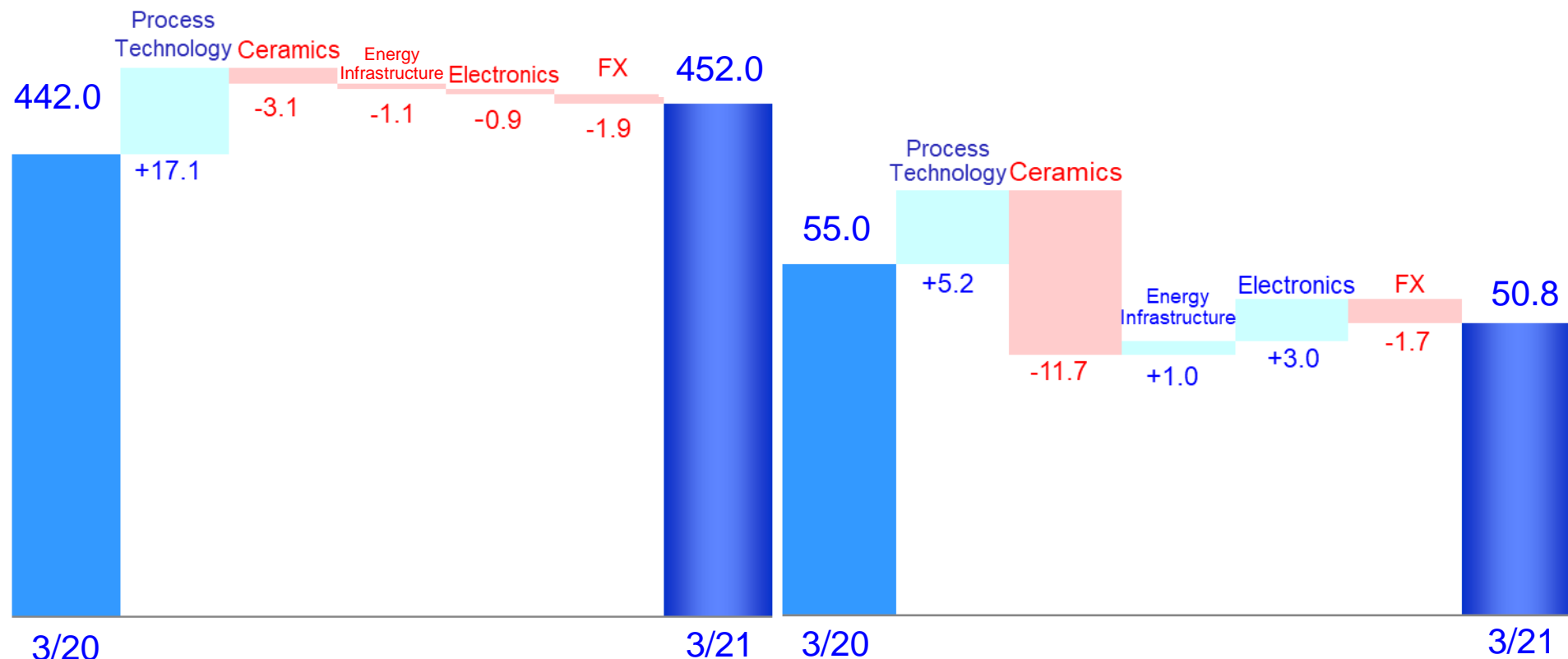
(※ 12.6 billion yen impairment loss for non-current assets in the manufacturing subsidiary of automotive-related at Thailand and the package business was recorded in FY2019.)

Change Analysis for FY2020

(¥ Bil.)

Sales

Op. Income



FX Rate

3/20
¥109 /USD
¥121 /EUR

3/21
¥106 /USD
¥124 /EUR

Forecasts for FY2021

	(¥Bil.)	FY2020	FY2021	Growth ratio
Net Sales		452.0	485.0	+7%
Operating Income		50.8	70.0	+38%
Ordinary Income		53.0	68.0	+28%
Profit Attributable to Owners of Parent		38.5	50.0	+30%
Exchange Rate	USD	¥106	¥105	-¥1
	EUR	¥124	¥125	+¥1

YOY Sales and income are expected to increase. Sales are expected the highest sales. *

*FY2018 ¥463.5 bil.

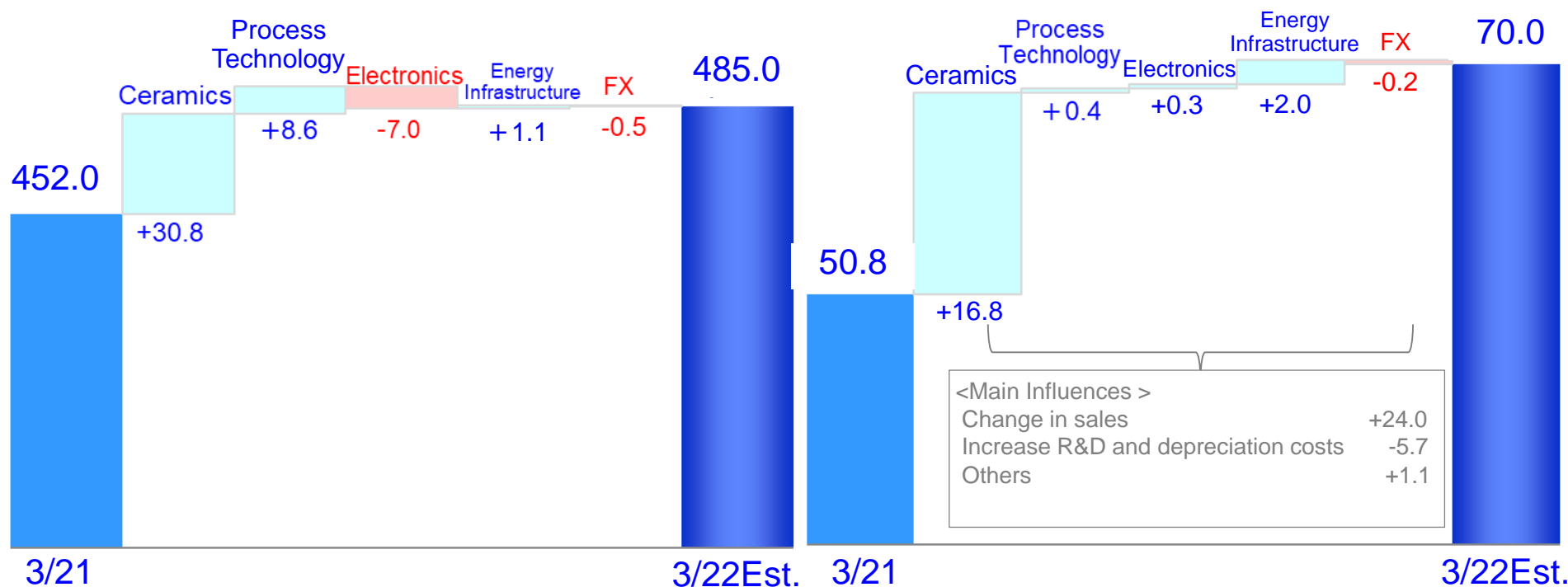
- Energy Infrastructure** Demand for both Insulators and Energy Storage is forecast to be weak, but aim to reduce the deficit through slimming down of headcount, cost reduction and improving sales prices.
- Ceramics** In addition to tightened emission regulations, demand increased against the backdrop of the recovery in passenger car and truck sales. Income is expected to go up as the effect of higher sales exceeded that of increases in depreciation expenses and others.
- Electronics** Sales declined since Soshin Electric Co., Ltd. was excluded from consolidation and, also accounting standards for revenue recognition changed. Income are expected to increase slightly.
- Process Technology** Strong Foundry investment will continue. Income is expected to be roughly same as the last year despite solid demand.
- Extraordinary Income** The 4.5 billion yen is to be recorded as subsidy for the capital expenditures made for production increase implemented in the past fiscal years.

Change Analysis for FY2021

(¥ Bil.)

Sales

Op. Income



FX Rate

3/21
¥106 /USD
¥124 /EUR

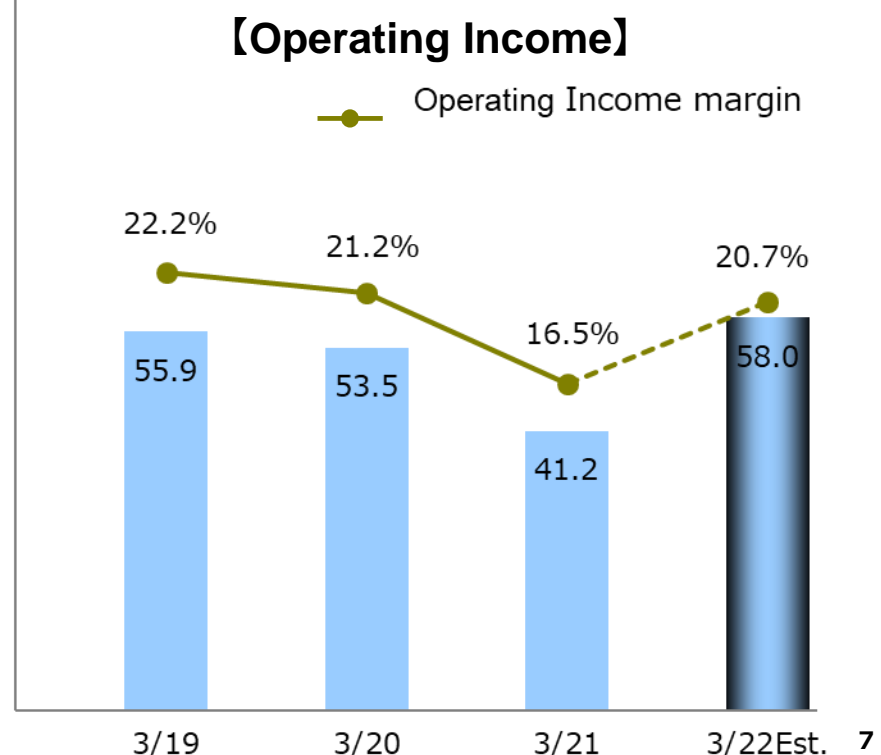
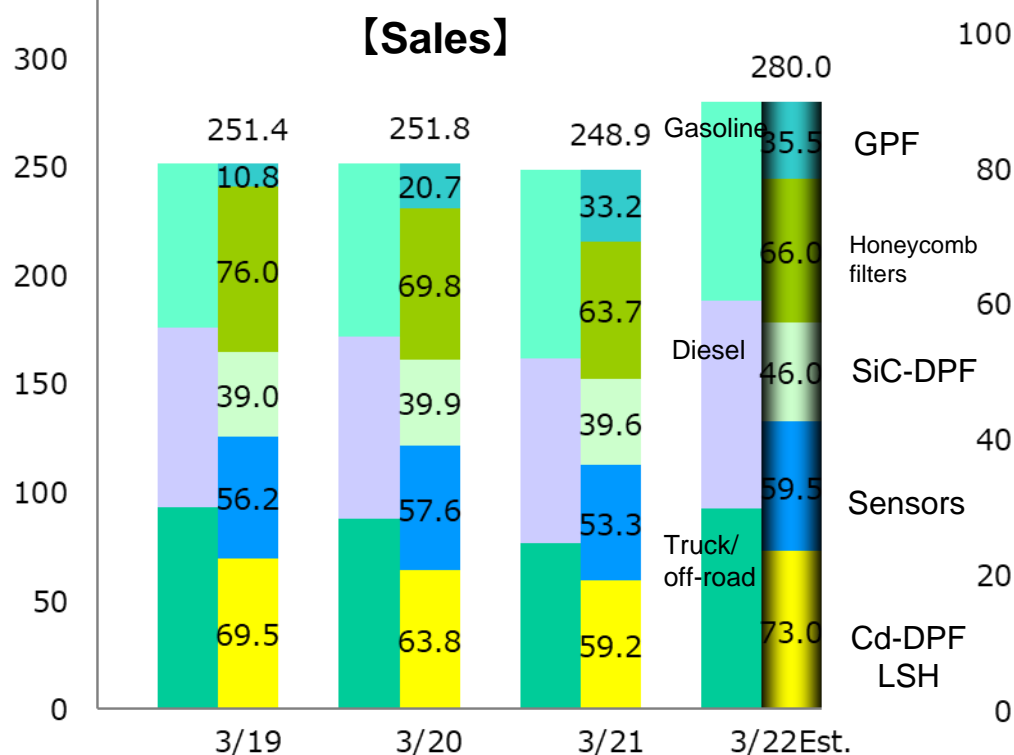
3/22 Est.
¥105 /USD
¥125 /EUR

● Automotive-related

In addition to the tightening emission regulations in China and India, the demand is expected to increase for the recovery of passenger car and truck sales that have continued from the 2nd half of the previous fiscal year. Income are expected to increase as the effect of higher sales exceeds a rise in depreciation and amortization and other costs. The sharp rise in freight costs that occurred in the previous fiscal year will continue for the time being.

- GPF/Honeycomb filters (for gasoline-fueled vehicles) : The demand is expected to increase due to the recovery trend of passenger car sales in Europe and China.
- SiC-DPF (for diesel passenger vehicles/trucks) : In addition to the recovery of passenger car sales in Europe, sales are forecast to increase for the number of NGK's product adoption.
- Sensors (for diesel passenger vehicles/trucks) : In addition to the tightening emission regulations in China, the demand is forecast to increase for the recovery of passenger car sales in Europe.
- Cd-DPF/LSH(for trucks) : In addition to the tightening emission regulations in China, the demand is forecast to increase for the recovery of truck sales.

(¥Bil.) <After consolidation elimination>



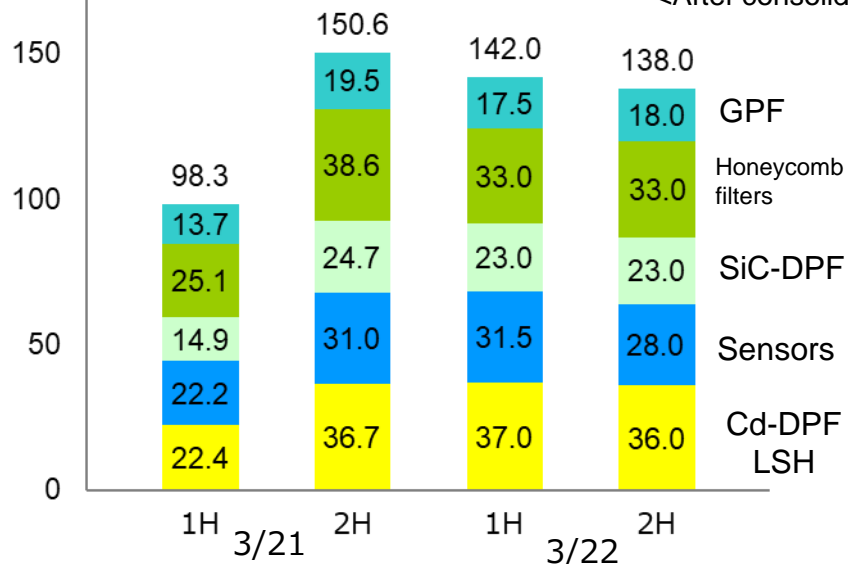
Demand Status of the Previous and Current Fiscal Years/ Mid-and Long-Term Forecasts for performance

【Demand Status of the Previous and Current Fiscal Years】

(¥Bil.)

【Sales Trends of 1H and 2H】

<After consolidation elimination>

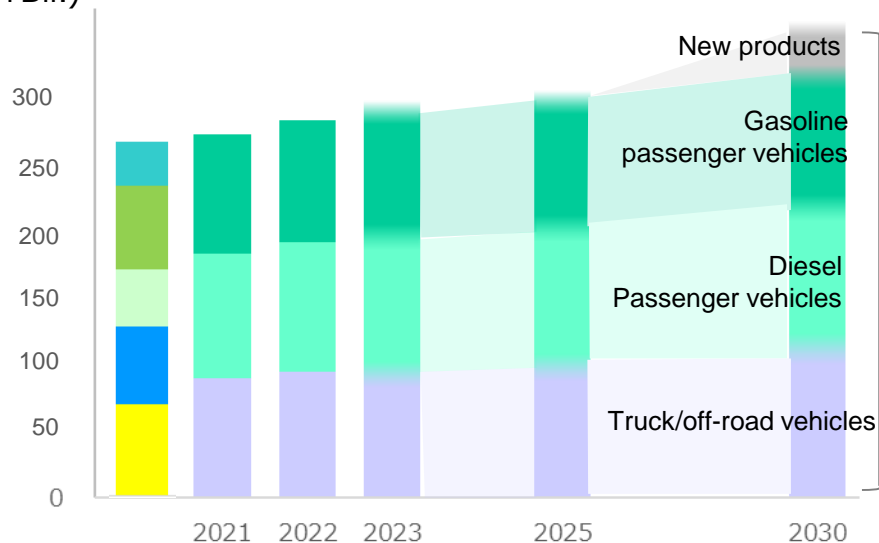


In the last second-half, recoveries in both automobile demand and inventory plus measures to stimulate demands in China and a rush demand before implementation of the China VI standards pushed up demand for our products significantly.

In the first half of 2021, demand is expected to remain strong for a while, but a decline is expected for the second half in anticipation of weaker demand as a rebound.

【Mid-and Long-Term Forecasts for Performance】

(¥Bil.)



Stronger sales are expected to continue for the time being as demand for our products increases due to the tightening emission regulations.

Although additional investments is to be made in some of our locations for highly technological products, the investment for ramping up production to meet demand up to and around 2030 has already been implemented.

The immediate future will be the payback period of the investment, and we will benefit from a volume increase and plan to maximize the cashflow.

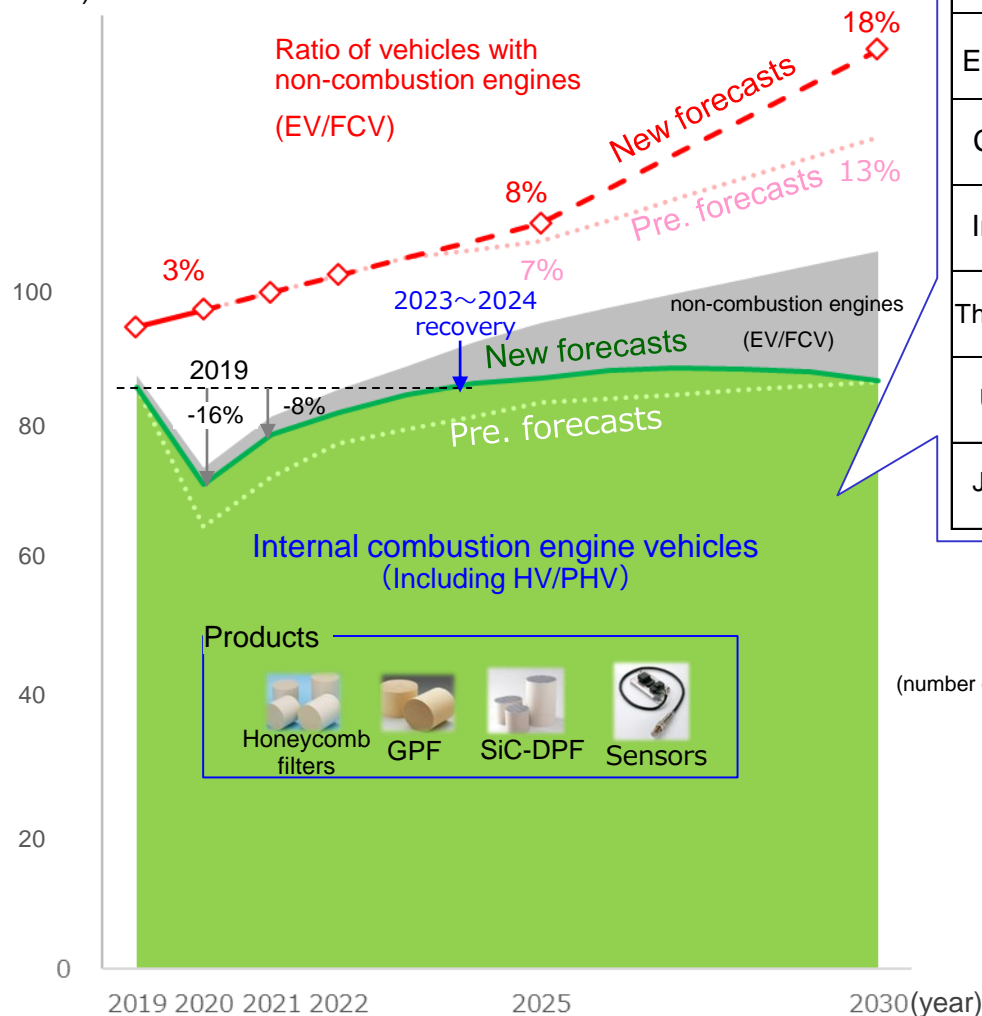


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Forecasts for Products for Passenger Vehicles

〔Forecasts for passenger car sales〕
(NGK's Est.)

(mil.units)

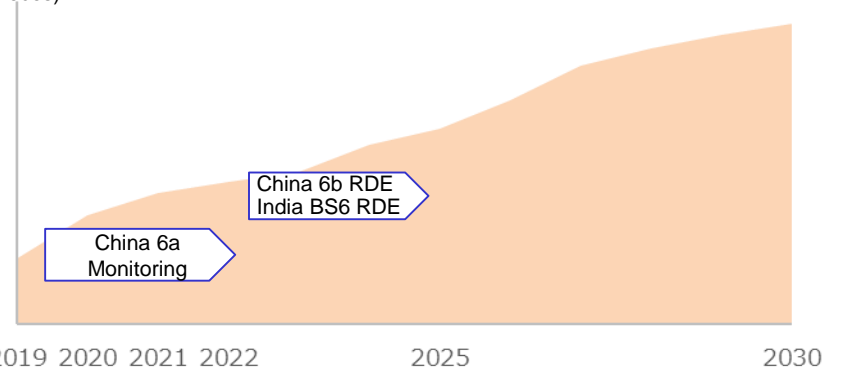


〔Forecasts for emission regulations〕 (NGK's Est.)

	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Europe	EU6d-Full							EU7			
China	China6a (All)			China6b (All)				China7			
India	BS6 Stage I			BS6 Stage II				BS7			
Thailand					EU5			EU6b			
U.S.	Tier3 LEVⅢ					PM 1mg/mile					
Japan	PPNLT (WLTC)				GE RDE						

Total Demand Forecast for GPF

(number of pieces)

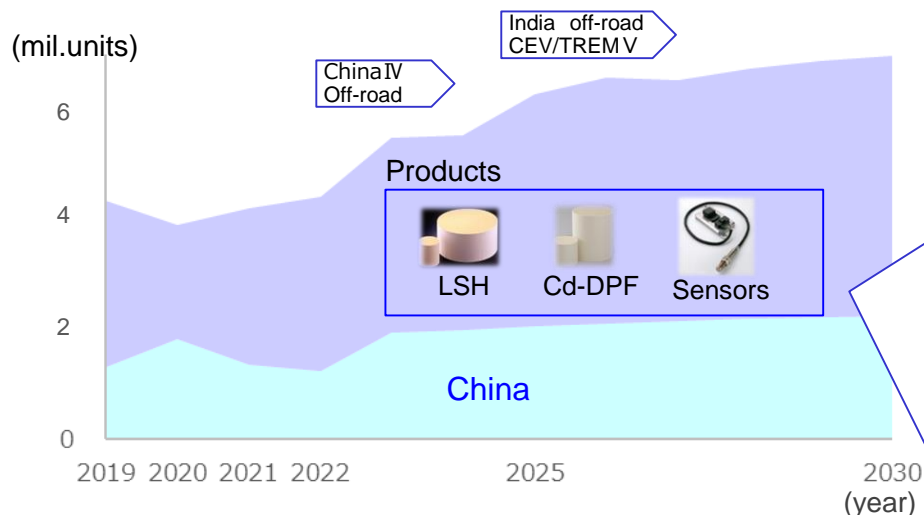


The ratio of non-internal combustion engine vehicles is forecast to be 18%, previous forecasts was 13%. Demand for Internal combustion engine vehicles will recover at a faster pace than expected in previous forecasts(October) and remain stable for the time being. Demand for NGK's products is forecast to increase gradually by the emission regulations.

In addition to the recovery of passenger car sales, the demand is forecast to increase for the tightening emission regulations in China. Total demand is expected to increase as the tightening emission regulations continues in other countries in the mid- to long-term.

Forecasts for Products for Truck/off-road Vehicles

〔Forecasts for number of trucks/off-road vehicles subject to post-processing〕 (NGK's Est.)



The demands for LSH, Cd-DPF and Sensors are forecast to increase due to tighter emission regulations in India, China, emerging countries.

〔Forecasts for emission regulations〕

■ Trucks

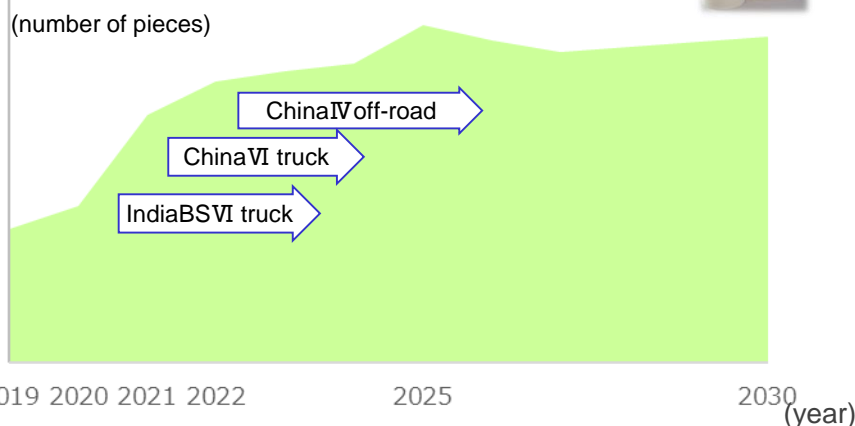
	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Europe	EuVI StepD		EUVI StepE				EUVII				
China	ChinaVIa (Urban)	ChinaVIa (All)		ChinaVII				ChinaVII			
India	BSVI Stage I			BSVI Stage II				BSVII			
Thailand					Eu V			EUVI			
U.S.	US10				CARB Low-NOx			CARB/EPA Ultra Low-NOx			
Japan	PPLNT					PPPLNT					

■ Off-road

	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Europe	Stage V										
China	ChinaⅢ			ChinaⅣ							
India			TREMⅣ CEⅣ				TREMⅤ CEⅤ				
U.S.	Tier 4F					Tier5					
Japan	Tier 4F					Tier5					

Cd-DPF will be required to be installed because China VIa will be applied for trucks in China throughout the country in 2021. And LSH will be added. The demand for Cd-DPF is forecast to increase steadily due to China IV will be applied for off-road vehicles in 2022.

Total demand forecast of Cd-DPF



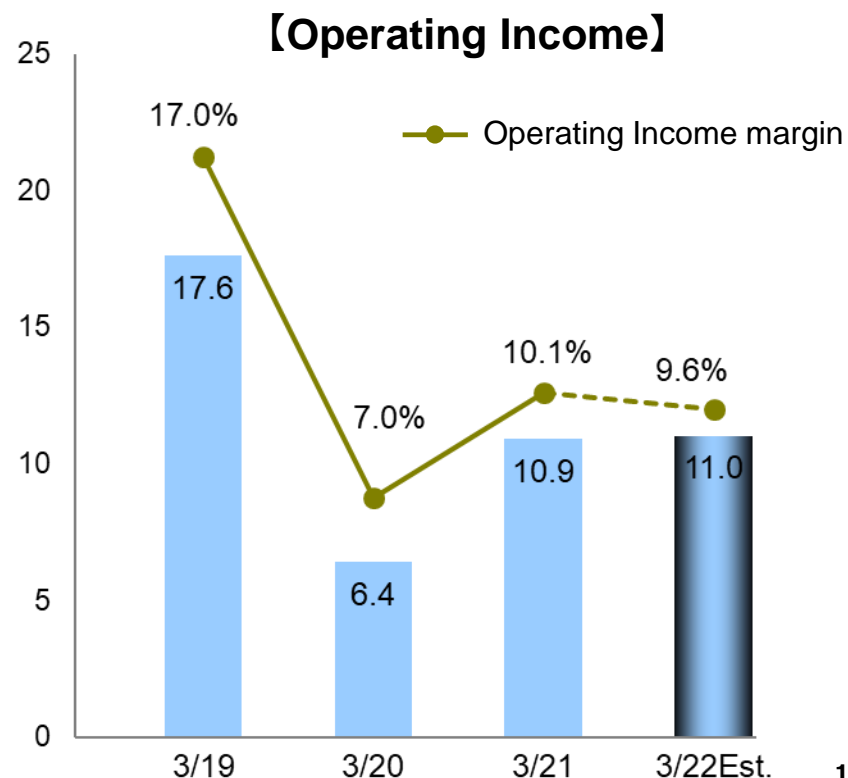
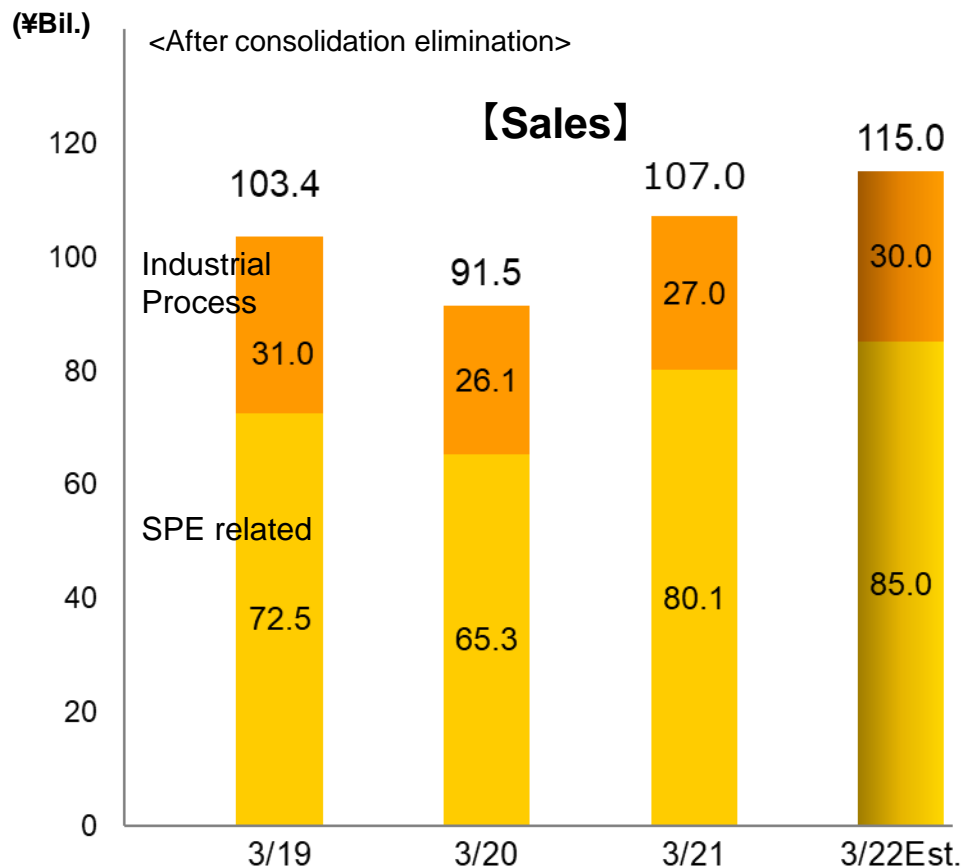
The demand for trucks/off-road is forecast to increase steadily due to tighter emission regulations in India, China, emerging countries.

● Ceramics for Semiconductor Manufacturing Equipment (SPE-related products)

Strong foundry investment will continue given the growing demand for high-performance semiconductors for 5G smartphones and data centers. Memory investment is also expected to stay on a recovery track. Although sales are expected to go up due to an increase in sales volume, income are expected to decline due to an increase in depreciation and amortization and other costs.

● Industrial processes

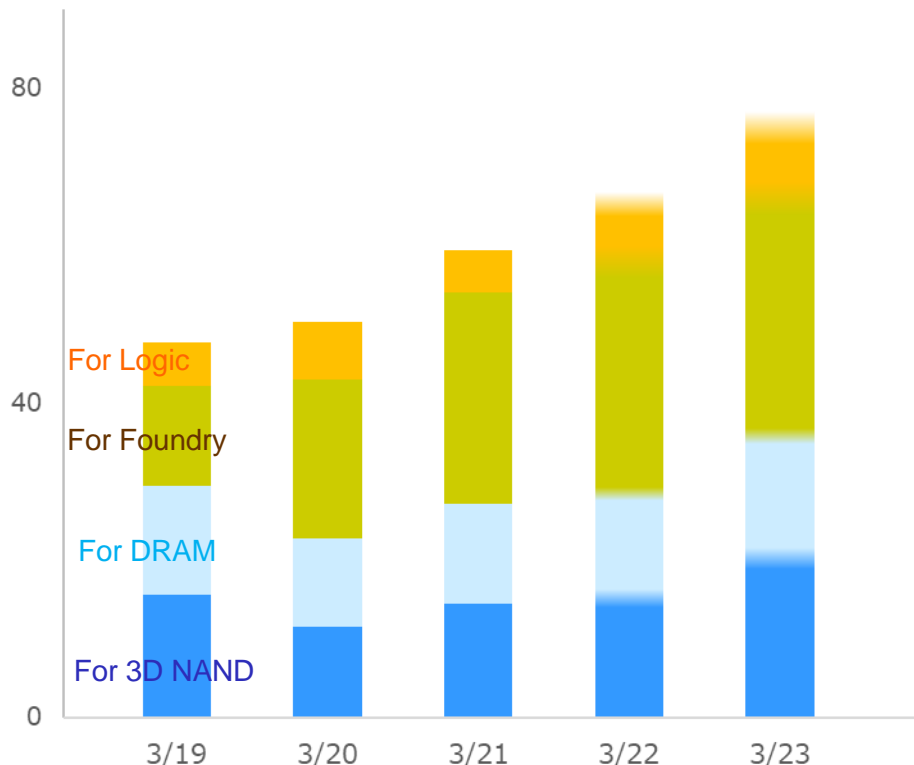
• Sales and income are expected to increase for higher demand in heating systems for cathode materials used in lithium-ion batteries on the background of the increasing EV.



Forecasts for the Process Technology Business

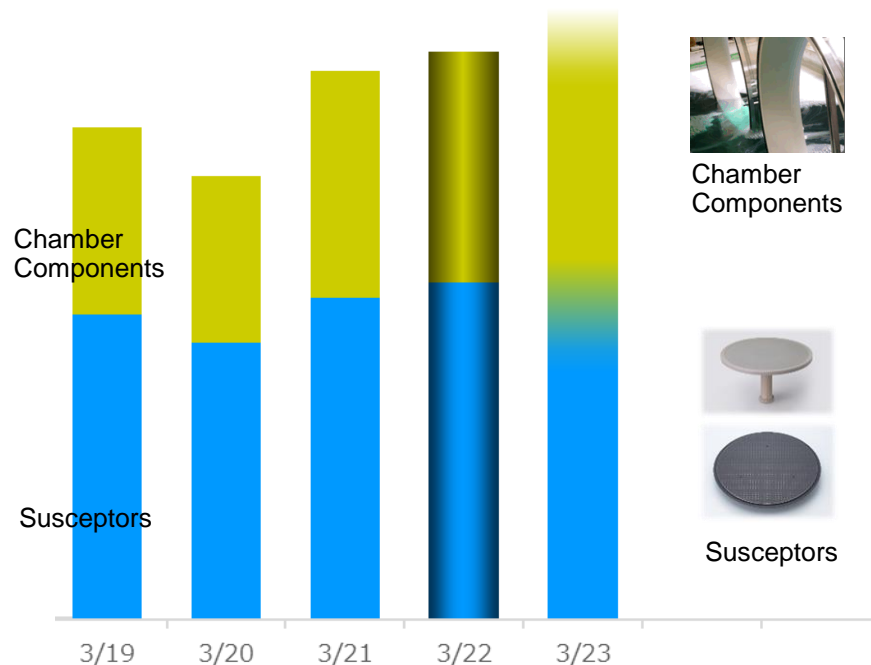
■ Ceramics Components for Semiconductor Manufacturing Equipment

(\$Bils.) Investment trends for semiconductor front-end manufacturing equipment by use (NGK's est. based on SEMI forecasts)



Reflecting the introduction of AI, expansion of 5G, and the IoT, demand for semiconductors, particularly logic ICs and DRAMs, will increase, and high levels of capital investment will continue for the time being. In addition, as a result of the current shortage of industrial semiconductors, there are moves in the United States and Europe to increase the self-sufficiency rate of semiconductors in order to avoid the risk of concentrated production in Asia. Thus, it is now more likely that higher-than-expected capital investment will be scheduled.

Sales Image of Ceramics Components for Semiconductor Manufacturing Equipment



Chamber Components



Susceptors

Both of Susceptors and Chamber Components sales are forecast to increase. NAND investment, which was expected to grow sharply, has been on only a moderate recovery, and growth in demand is limited. The expansion of production facilities to prepare for future demand increases has almost been completed, and with the introduction of DX technology further improvement in productivity will be planned.

● Electronics Components

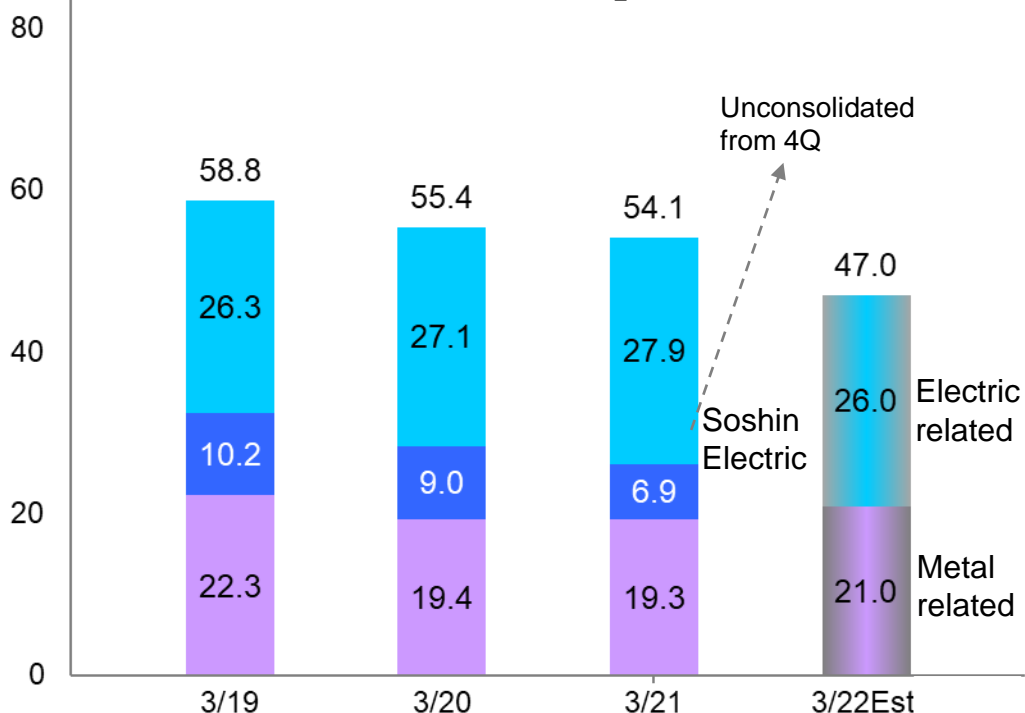
- Sales from piezoceramics actuators for HDD are forecast to increase due to increasing demand for large capacity HDDs driven by the strong data center investment.
- Sales from wafer products are forecast to decrease due to mainly the effect of changes in accounting standards for revenue recognition.
- Sales from package products are forecast to increase due to increasing demand for micro crystal packages driven by requirement for space-saving devices such as smartphones and the progress of high-frequency, short-range wireless communication.

● Metal Related Products

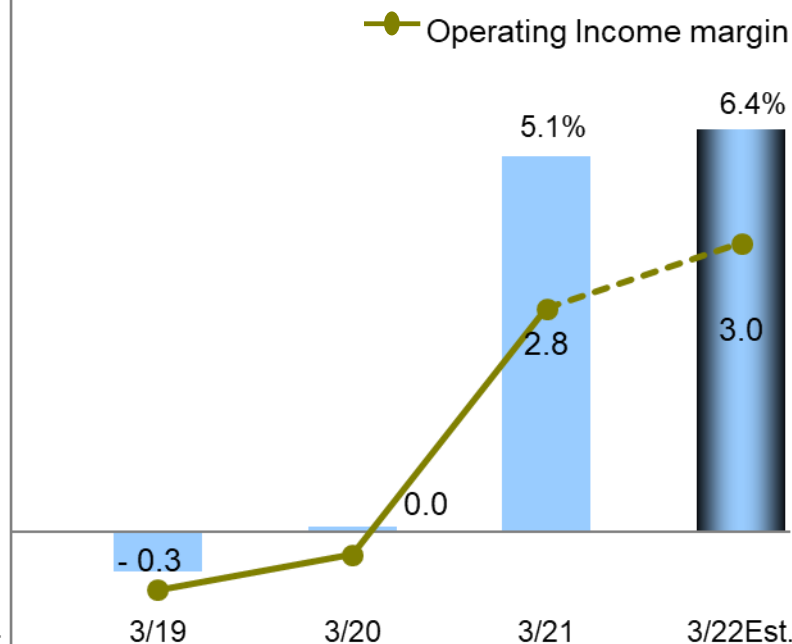
- Sales and income are expected to increase due to the increasing demand for automotive-related products.

(¥Bil.) <After consolidation elimination>

【Sales】



【Operating Income】

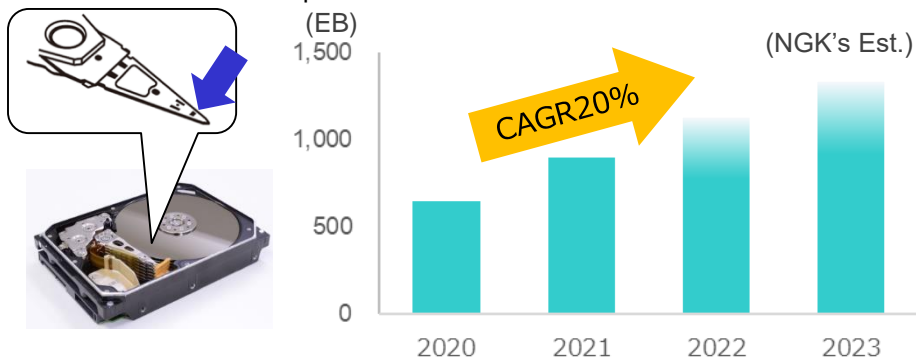


Forecasts for the Electronics Business

■ Piezoceramic Actuators for HDD (Electronic Components)

A piezoceramic actuators for large-capacity HDDs primarily used in nearline servers for data centers. Backed by changes in business structures due to COVID-19, demand for large-capacity HDDs will continue to expand. In a bid to secure cost competitiveness over SSD, the capacity of HDD storage will further increase.

〔Expected sales volume of HDDs used in near-line servers〕

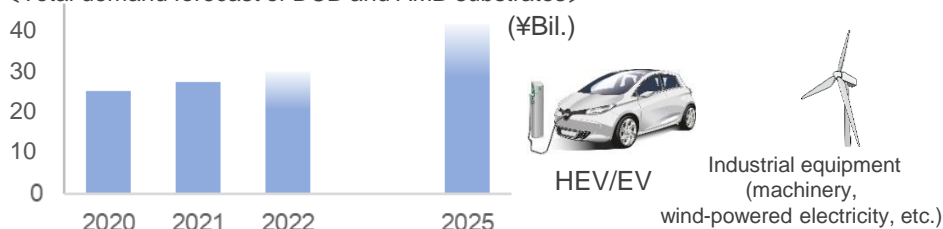


We will make investments in Malaysia to boost production and meet increasing demand, and develop high-function products for HDDs with larger capacity.

■ DCB circuit substrate (Electronic Components)

Ceramic circuit substrates for power modules of automotive and industrial equipment with excellent reliability and heat conduction. The demand is forecast to expand in the medium and long term due to electrification of automobiles (EV/HV).

〔Total demand forecast of DCB and AMB substrates〕

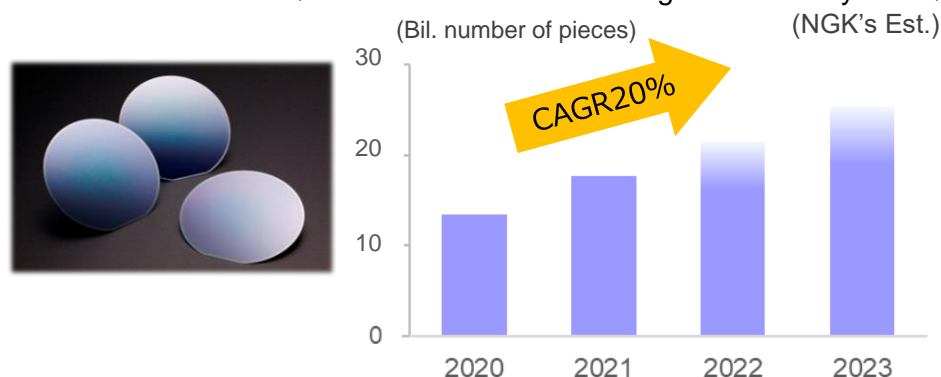


We will work on satisfying increasing demand for in-vehicle products.

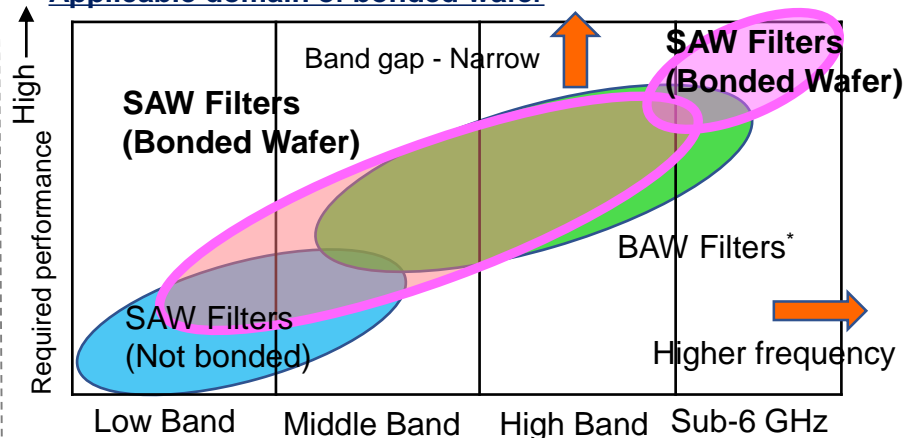
■ Bonded Wafer for SAW Filter (Electronic Components)

The demand for composite wafer products for high-functionality SAW filters with an improved temperature profile, is forecast to expand (CAGR approx. 20%) as the required performance level rises and the number of filters installed on mobile devices increases due to advancements in communication systems. High-performance filters with new structures are required for Sub-6 GHz (3.5GHz–6GHz) devices which is expanding along with the progress of 5G.

〔Total demand forecast of high-functionality filters〕



Applicable domain of bonded wafer



(* BAW Filters: Filter with a complex structure that is produced in the thin film process)

We will launch new products for Sub-6 GHz devices used for 5G to meet the increasing demand.

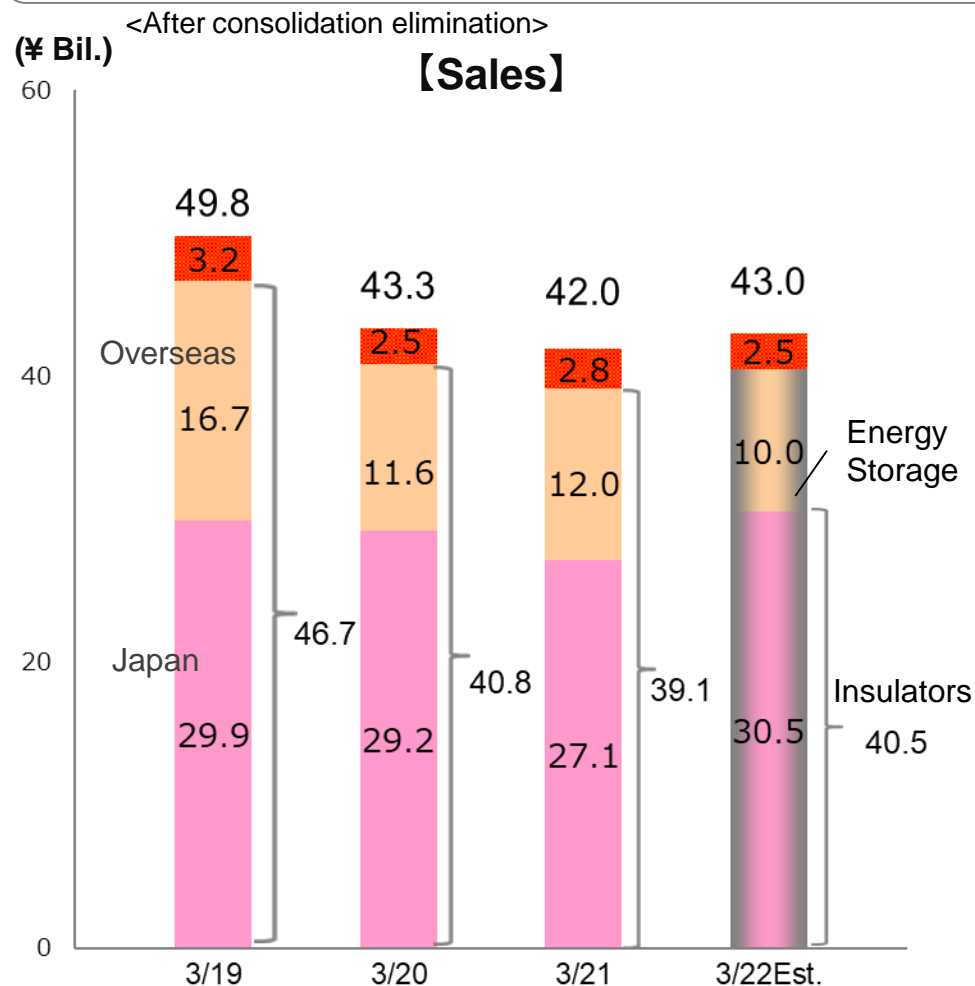
Energy Infrastructure Business

● Insulators

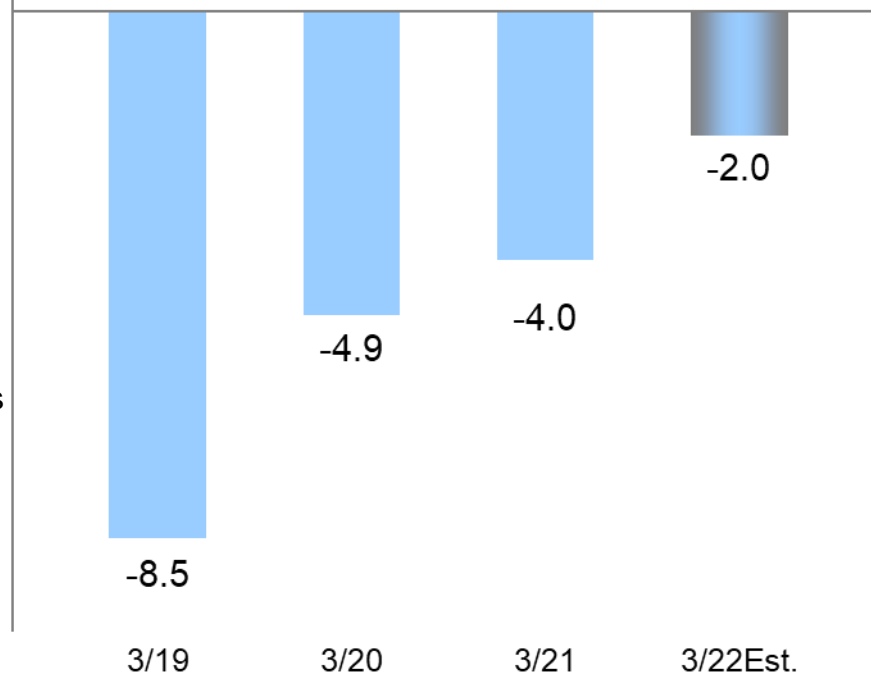
- Domestically, demand remains weak and while overseas new installation projects have been completed.
- Sales will remain unchanged and while the company is expected to return to profitability for the first time in six years due to the streamlining of its workforce, cost reduction and improved sales prices.

● Energy Storage

- The deficit is forecast to continue due to sluggish demand of users in Japan.



【Operating Income(Loss)】



Forecasts for the Energy Infrastructure Business

Anticipated effects of the government's declaration to go carbon neutral by 2050

Greater use of renewable energy to achieve carbon neutrality (renewable energy to supply 50–60% of electricity in 2050) is anticipated. Also demands for insulators and storage batteries are expected to increase.

■ Insulators



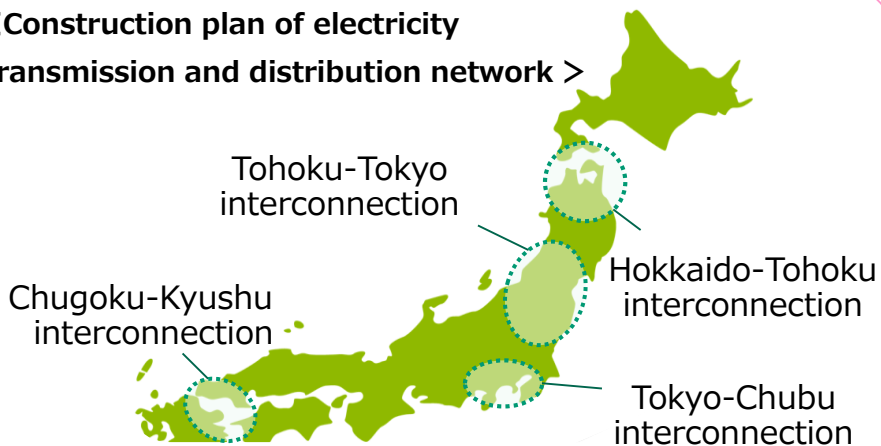
Insulators for power transmission

Japan :While it will take time for replacement demand to arise on a full-scale basis, a plan to construct a new electricity transmission and distribution network will take shape to prepare for the introduction of a large amount of renewable energy and enhanced resilience.

Overseas : New installation projects for Asia have been completed.

In Japan, we will focus on addressing demand for new insulators, while in overseas markets, we will focus on quality-oriented markets. We will also develop manufacturing bases to respond to future market changes.

<Construction plan of electricity transmission and distribution network >



※Project information is our estimate based on customer information and public information.

■ Energy Storage

【NAS®Batteries】

Japan: Large-scale implementation of renewable energy and discussions on local production for local consumption of electricity will be more active.

Overseas: More solid demand for long-life batteries for solar power generation is expected.



NAS®Batteries

We will work on developing battery business models including exploring the provision of battery services in cooperation with renewable energy operators and will endeavor to expand sales channels and improve cost competitiveness in the business tie-up with BASF.

<Efforts to expand sales of NAS®Batteries > •Foundation of new regional power company. (April 8, 2021)

In order to realize a zero carbon city, we formed “Ena Electric Power Co.Inc.” jointly with Ena City and Chubu Electric Power Miraiz Co. Inc. By combining solar power generation facilities and NAS Batteries, we stably supply renewable energy to public facilities and others in Ena City, thereby contributing to regional revitalization and decarbonization. We have also strengthened the ability to respond to natural disasters as an emergency power.

•Adopted for Use in Crediting Mechanism Project by the Asian Development Bank and the Ministry of the Environment, Government of Japan.

(March 22, 2021)

Jointly with JGC Holdings Corporation and MCS International, we received an order for large-capacity NAS Batteries to be installed in solar power generation facilities for the Ministry of Energy, Mongolia. We will help to expand the use of renewable energy and ensure a stable supply in areas suffering from serious air pollution.

■ Zinc Rechargeable Batteries

Batteries met inherent safety suitable for indoor installation and high capacity, utilizing our proprietary ceramic separators.

The features are: high energy density, ability to be installed in small spaces, cell operation at room temperature, and low risk of internal combustion and thermal runaway because non-flammable water solution is used in electrolyte solution.



Main Applications

Bldg./School etc.

- Peak cut
- Emergency power
- Renewable energy



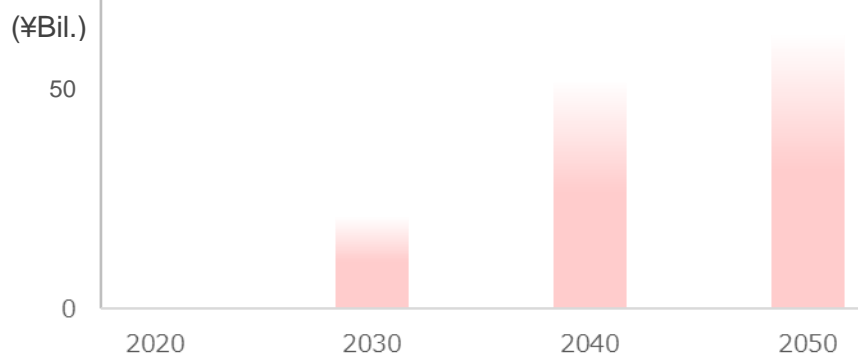
Communication Facilities

- Emergency power
- VPP



Storage battery for consumer

[Long-term expected sales of Zinc Rechargeable Batteries]



We will aim to launch products and build sales and distribution channels at an early phase of market introduction by accelerating battery development.

■ CO₂ Separation Membranes

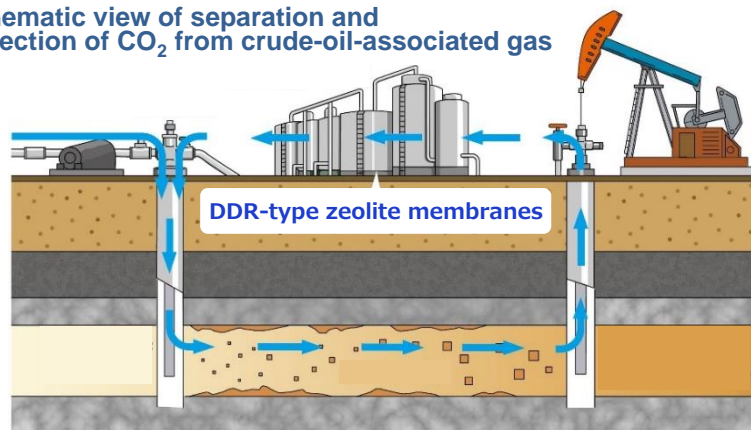
This is one of the largest zeolite membranes that separate CO₂ even at high CO₂ concentrations, high pressures and high temperatures efficiently. It separates and recovers CO₂ from natural gas and crude-oil-associated gas.

In addition to reducing CO₂, it contributes to cost reduction.

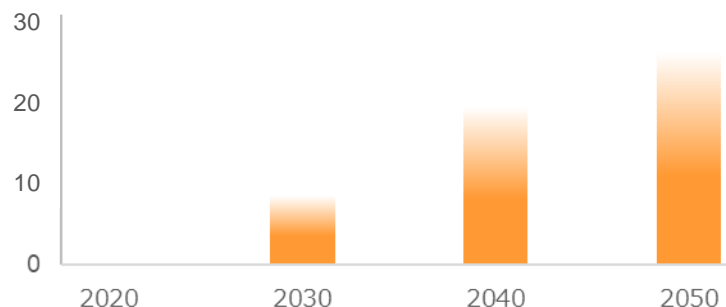
By developing this technology, we have also started efforts to separate CO₂ from industrial exhaust gas.



Schematic view of separation and collection of CO₂ from crude-oil-associated gas



[Long-term expected sales of Subnano-ceramic Membranes]



After entry into the natural resources field, we will head for CO₂ separation in fields such as industrial waste gas.

Future Growth Business

~Response to Digital Society~

■ EnerCera® Chip-type Secondary Battery

A small ,thin and high-energy-density Li-ion rechargeable battery using our unique crystal-oriented ceramic plate as the electrode. It produces the large current required for wireless communication, and its resistance to heat enables high-temperature processes to be mounted on devices. The batteries will contribute to the spread of next-generation devices such as IOT devices.



Main Applications



Smart Card



Logistics trucking/sensor tags

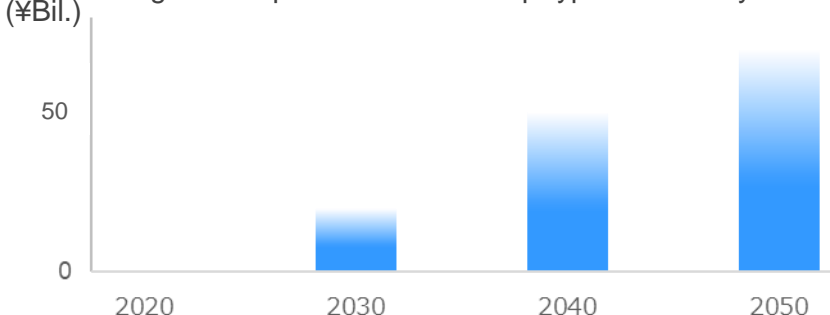


Wearable



Maintenance-Free IoT Devices

[Long-term expected sales of Chip-type Secondary Battery]



More and more products have our batteries installed in them. We will enhance our marketing to expand their application.

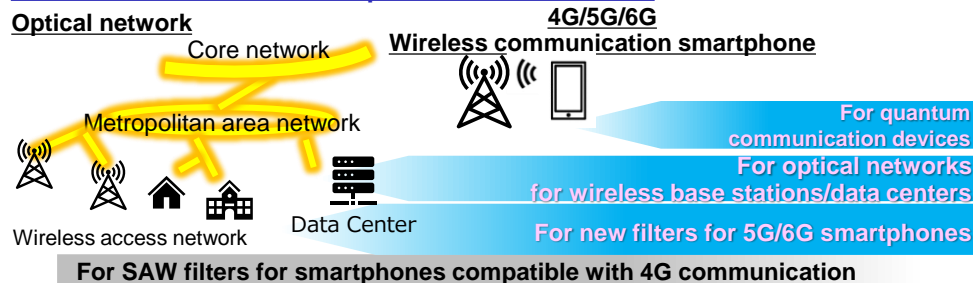
■ Wafers

We will apply technologies of Bonded Wafers for SAW Filters for new SAW filters for 5G communication, optical devices for optical networks/data centers, and LiDAR. With an eye on a digital society from 2025 onward, we will tackle the application of new materials and highly developed structures to respond to new uses such as optical computers, quantum communication devices and high-performance sensing devices, and will work on further expanding the bonded wafer business.

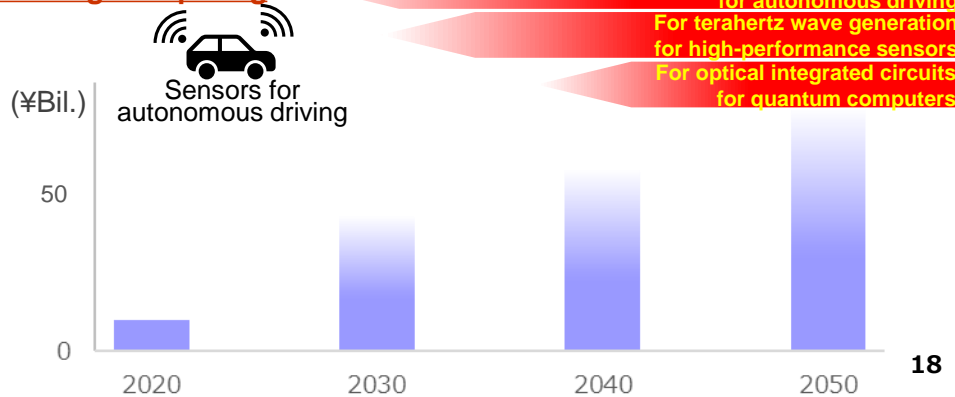


[Expansion image and long-term expected sales of New Bonded Wafer]
(Including Bonded Wafer for SAW Filter)

Wireless communications/Optical communications

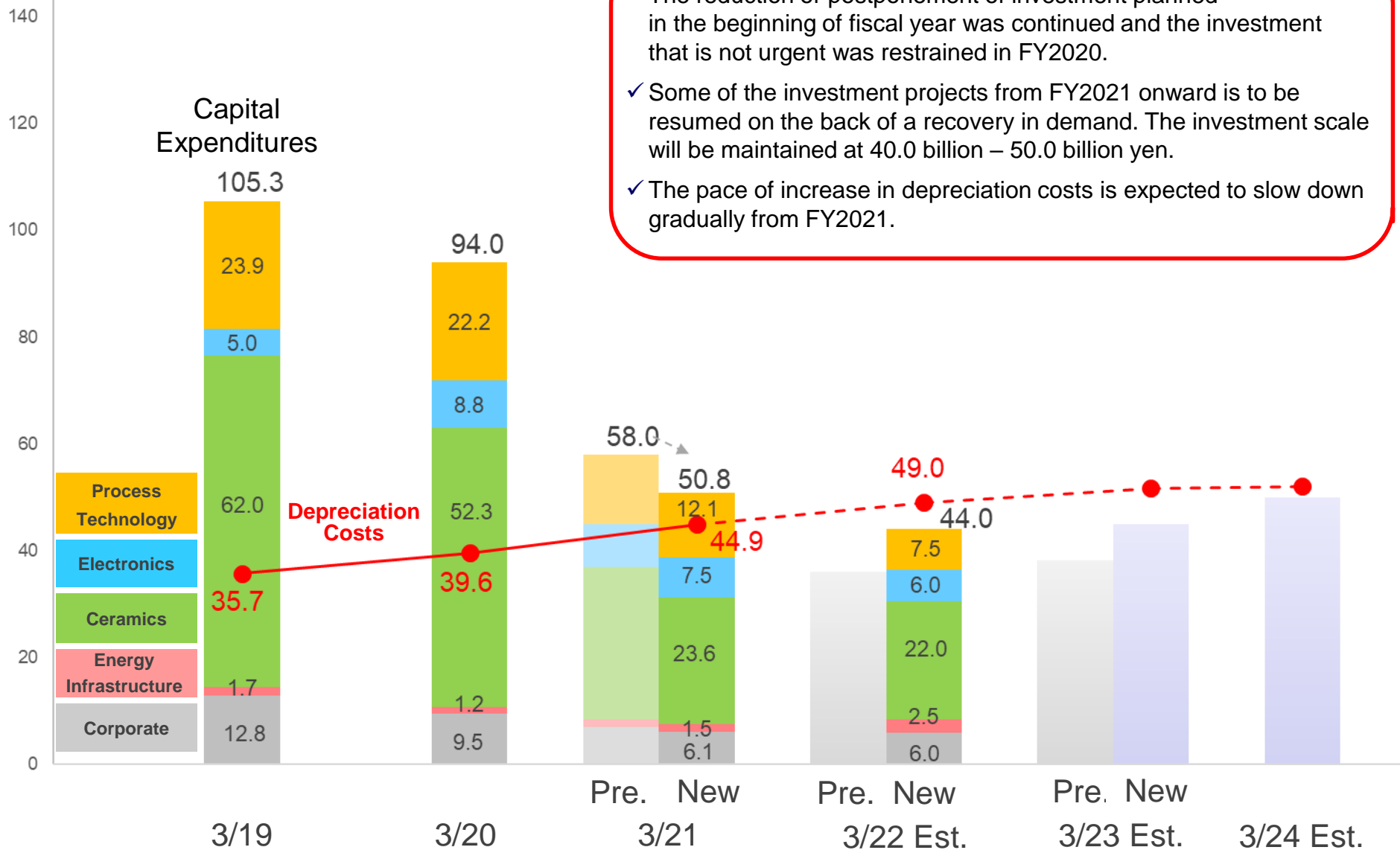


Sensing/Computing



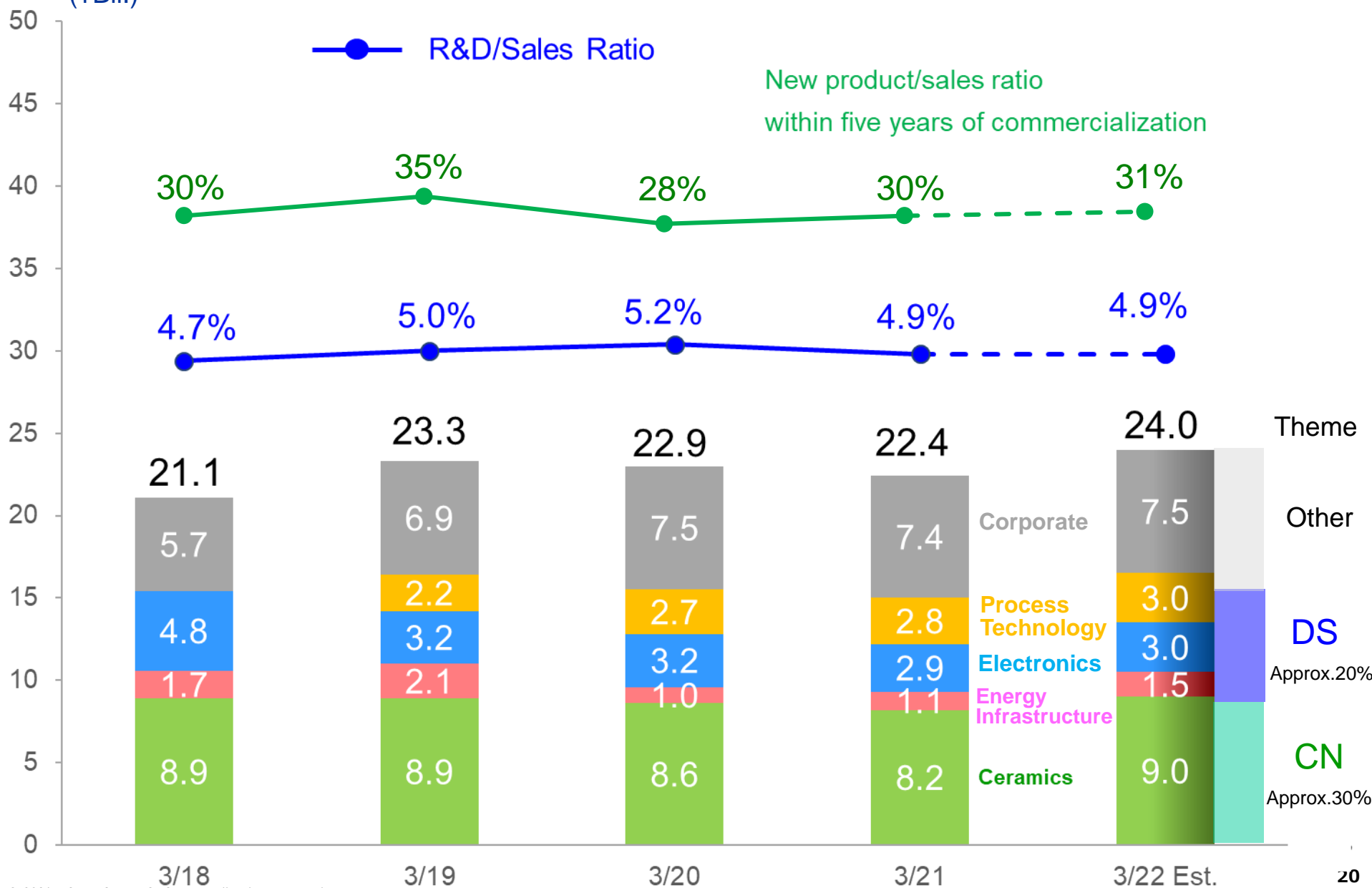
Capital Expenditures & Depreciation Costs

(¥Bil.)



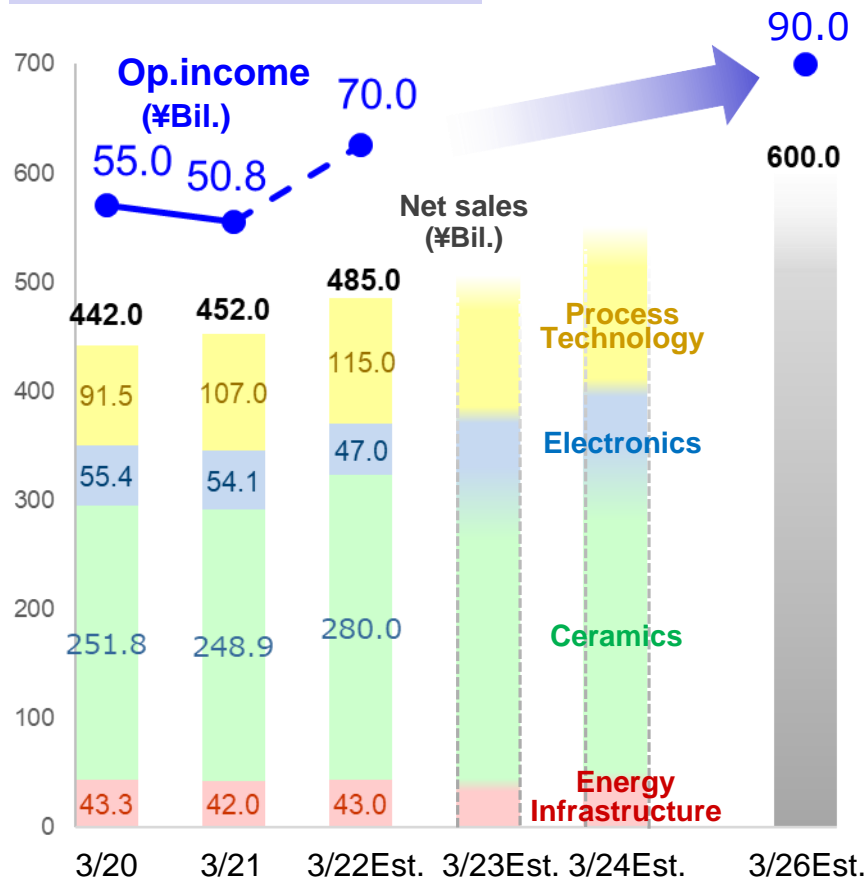
R&D Input

(¥Bil.)



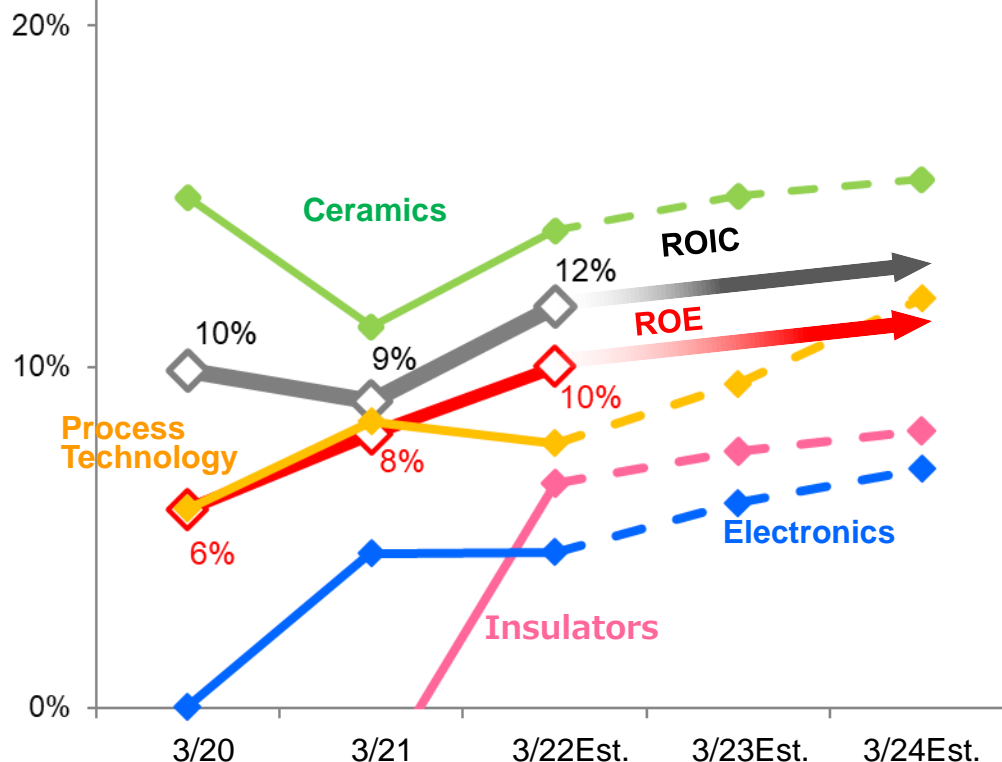
Mid-term Targets (Performance/ROIC)

Consolidated performance trends



ROIC transition

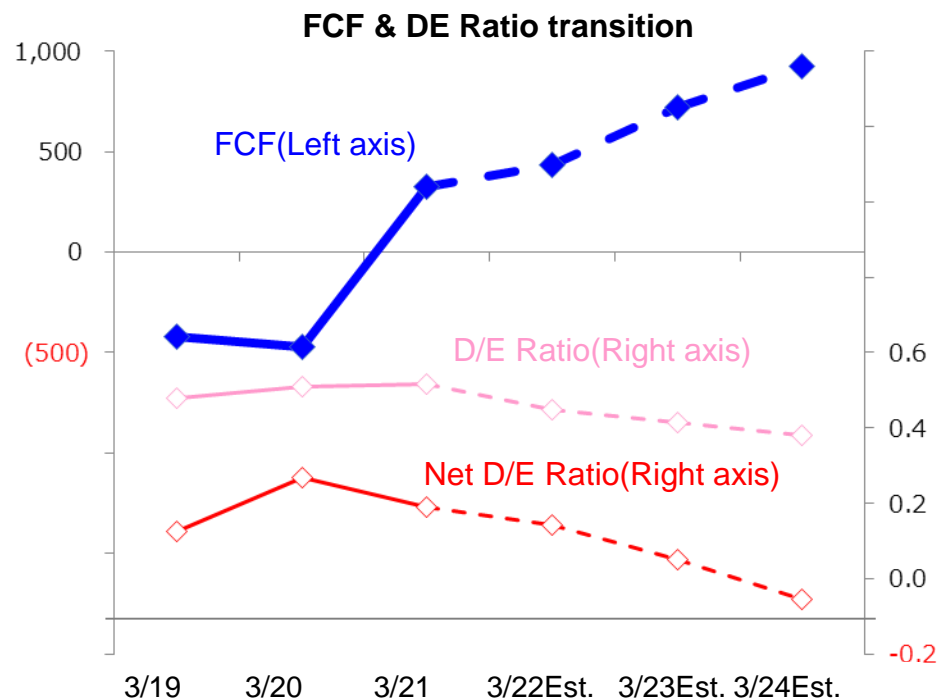
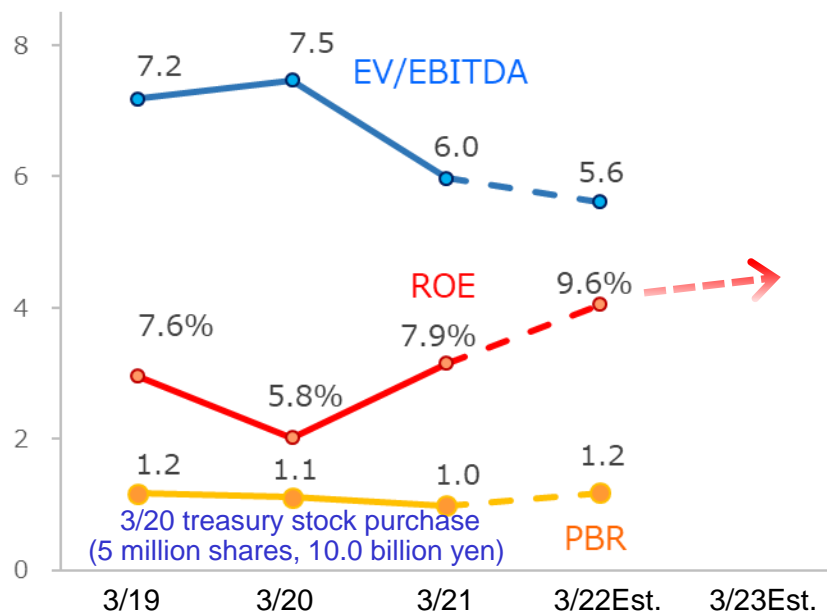
• Return on invested capital = $\frac{\text{Operating Income}}{\text{Business assets} \times 1}$
 (NGK-version ROIC)
 *1 : Business assets = sales receivables + inventories + fixed assets
 Calculated based on business assets (sales receivables + inventories + fixed assets) that can be managed by business departments rather than "capital" and "liabilities".



We will increase corporate value by adding value-added evaluation from ESG perspectives to ROIC as a key indicator, and efficiently investing management resources in core business expansion, cost reduction, development, and new businesses.

Capital Policy & Treasury Stock Purchase

- ✓ Achieve both profitability exceeding capital costs and financial soundness. Proactive shareholder returns from a mid- to long-term perspective.
- ✓ Maintain sound levels of profitability, capital turnover, and financial leverage consistent with business strategy.



- Target ROE is 10% or more, to be achieved by improving performance from FY2021 onward.
- Entering the payback period of the advance investment, cashflow is expected to remain positive for a while. We will secure funds for investment and, **respond flexibly to the acquisition and retirement of treasury stock with an eye to improving capital efficiency.**

<Outline for purchase and cancellation of NGK treasury stock>

Max. number of shares purchased: **5 million shares**

Period: 4/30/2021-7/30/2021

Max. acquisition price: **10 billion yen** (market purchase)

Scheduled date for stock cancellation: 9/30/2021

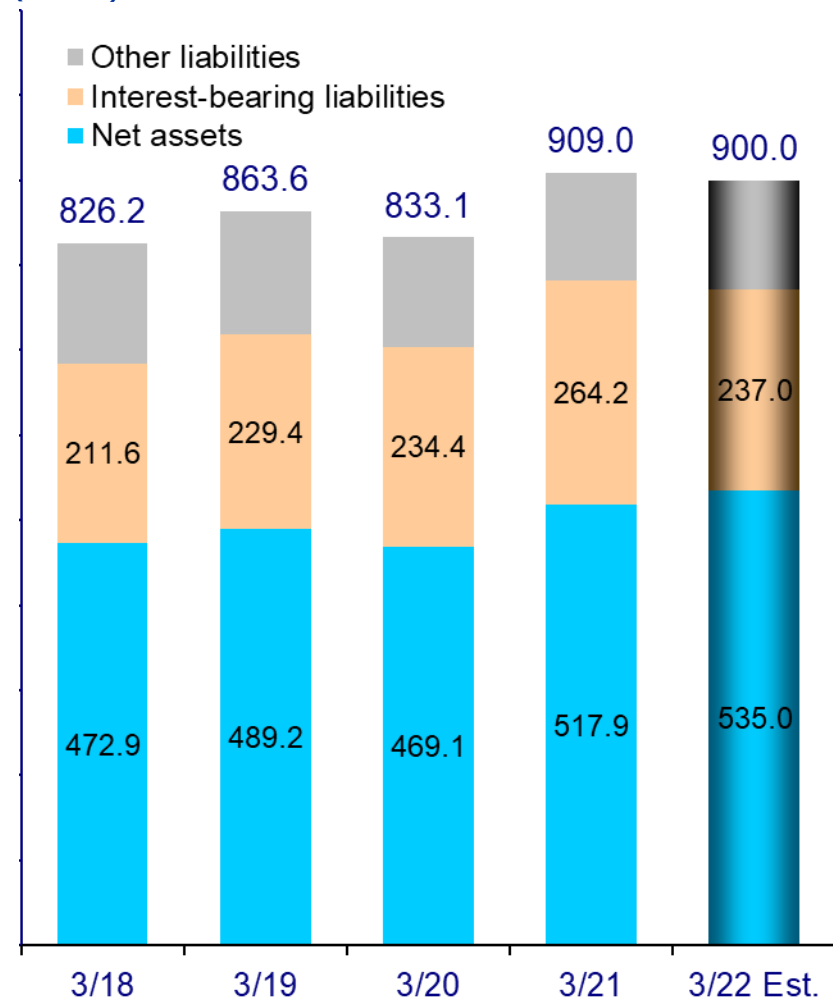
Summary of Cash Flow

(¥ Bil.)

	3/20	3/21	3/22 Est.
Operating Activities	53.2	85.6	87.0
Investing Activities	-60.8 Investment-95.4	-51.7 Investment-53.3	-49.0 Investment -44.0
Financing Activities	-18.8 New loans +37.0 Repayment -29.0 Treasury stock purchase -10.0	12.3 New loans +32.5 Repayment -9.4	-12.0 New loans +10.0 Repayment -33.0 Treasury stock purchase -10.0
Effect of Exchange Rate Changes on Cash & Cash Equivalents	-2.9	5.2	-4.0
Net Change in Cash & Cash Equivalents	-29.3	51.3	-12.0
Cash & Cash Equivalents-at the End of Year	94.7	146.0	134.0

Total Assets & Dividend

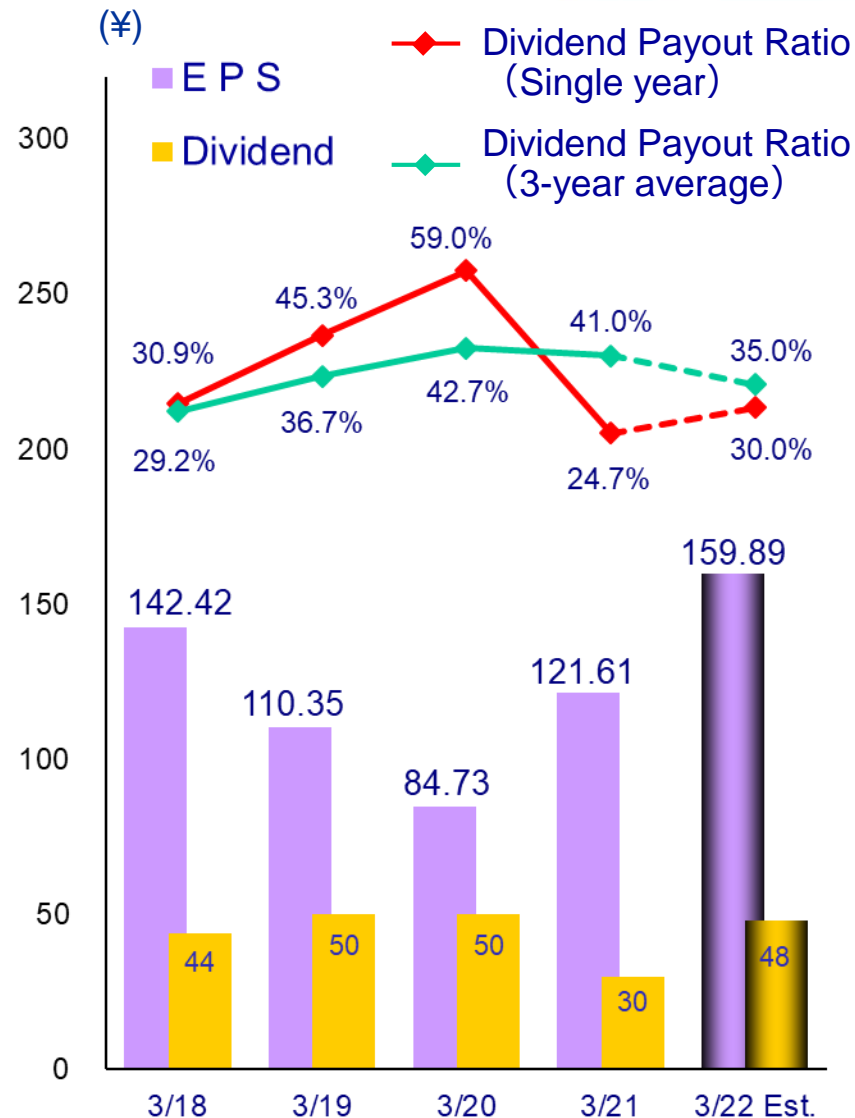
(¥ Bil.)



ROE	10.4%	7.6%	5.8%	7.9%	9.6%
D/E Ratio	0.46	0.48	0.51	0.52	0.42

Equity ratio of 50% or higher will be maintained.

(¥)



DOE	3/18	3/19	3/20	3/21	3/22 Est.
Single year	3.2%	3.4%	3.4%	2.0%	2.9%
3-year average	3.2%	3.3%	3.4%	2.9%	2.7%

Sales by Product (Annual)

(¥ Bil.)

<After Consolidation Elimination>	3/19	3/20	3/21	3/22 Est.
Insulators	46.7	40.8	39.1	40.5
Energy Storage	3.2	2.5	2.8	2.5
Energy Infrastructure	49.8	43.3	42.0	43.0
Honeycomb filters	76.0	69.8	63.7	66.0
GPF	10.8	20.7	33.2	35.5
Cd-DPF / LSH	69.5	63.8	59.2	73.0
SiC-DPF	39.0	39.9	39.6	46.0
Sensors	56.2	57.6	53.3	59.5
Ceramics Business	251.4	251.8	248.9	280.0
Metal related	22.3	19.4	19.3	21.0
Electric related	26.3	27.1	27.9	26.0
Soshin Electric CO.	10.2	9.0	6.9	-
Electronics Business	58.8	55.4	54.1	47.0
Industrial Process	31.0	26.1	27.0	30.0
SPE related	72.5	65.3	80.1	85.0
Process Technology Business	103.4	91.5	107.0	115.0
Total	463.5	442.0	452.0	485.0

Sales by Product (Semi Annual)

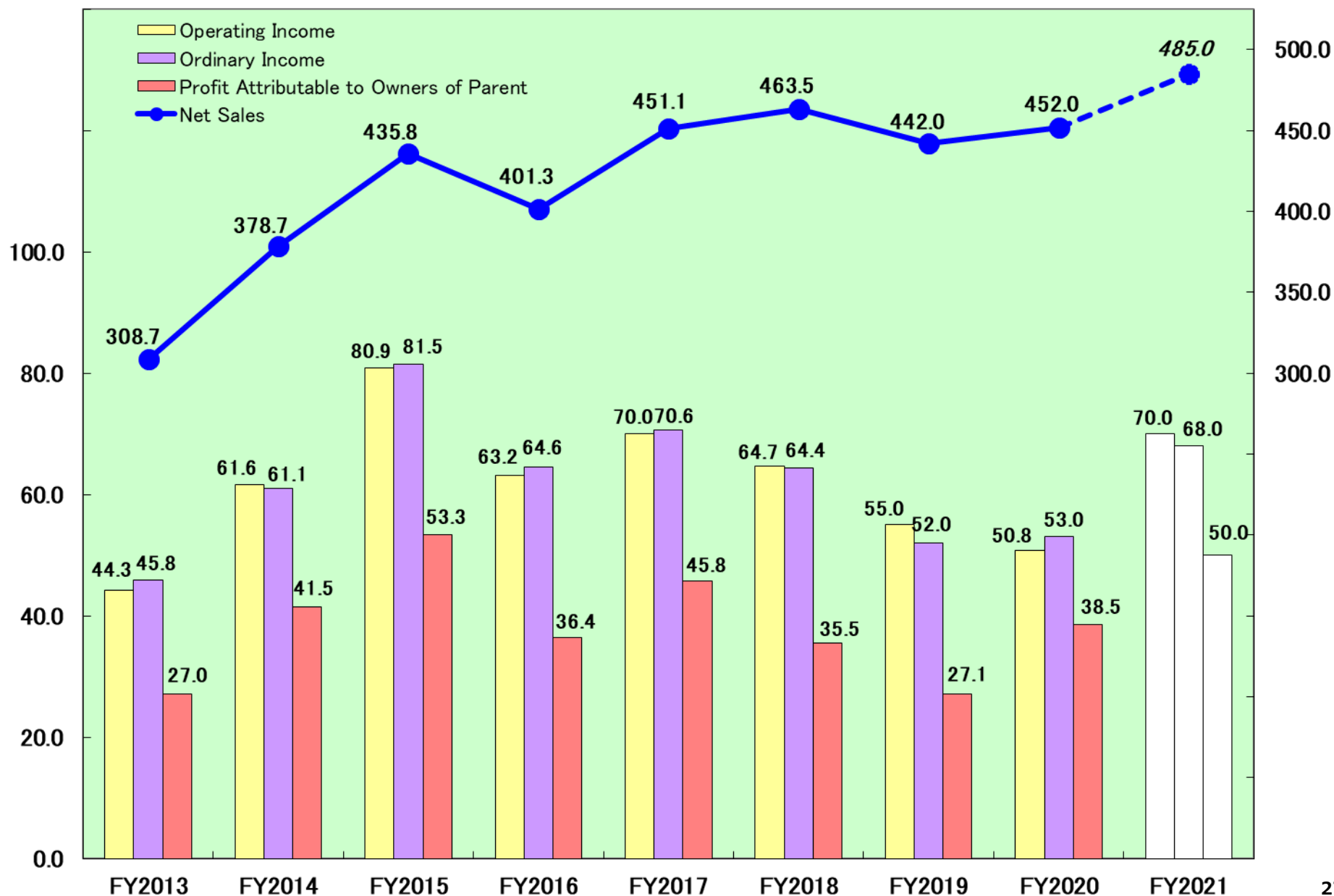
(¥ Bil.)

<After Consolidation Elimination>	3/21		3/22 Est.	
	1 st . Half	2 nd . Half	1 st . Half	2 nd . Half
Insulators	18.8	20.4	19.5	21.0
Energy Storage	0.3	2.5	0.5	2.0
Energy Infrastructure	19.1	22.9	20.0	23.0
Honeycomb filters	25.1	38.6	33.0	33.0
G P F	13.7	19.5	17.5	18.0
Cd-DPF/ LSH	22.4	36.7	37.0	36.0
SiC-DPF	14.9	24.7	23.0	23.0
Sensors	22.2	31.0	31.5	28.0
Ceramics Business	98.3	150.6	142.0	138.0
Metal related	8.8	10.5	10.0	11.0
Electric related	13.6	14.2	13.0	13.0
Soshin Electric CO.	4.4	2.5	-	-
Electronics Business	26.8	27.3	23.0	24.0
Industrial Process	10.7	16.3	13.0	17.0
SPE related	40.1	40.0	42.0	43.0
Process Technology Business	50.7	56.3	55.0	60.0
Total	194.9	257.1	240.0	245.0

Consolidated Operating Results

¥ Bil.

¥ Bil.



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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