

FY2020 Forecast (from April 1, 2020 to March 31, 2021)

June 11, 2020



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NGK INSULATORS, LTD.

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

Forecast for FY2020

(End in March 31, 2021)

Segment Information

Capital Expenditure / Depreciation Cost / R&D

Financial Condition

(Cash Flow/Total Assets&Dividend)

Forecast for FY2020

	(¥Bil.)	FY2019	FY2020	Growth ratio
Net Sales		442.0	420.0	-5%
Operating Income		55.0	30.0	-45%
Ordinary Income		52.0	29.0	-44%
Profit Attributable to Owners of Parent		27.1	17.0	-37%
Exchange Rate	USD	¥109	¥105	-¥4
	EUR	¥121	¥115	-¥6

YOY (Year-On-Year) expected to decrease in sales and income

Impact of Covid-19: Sales -¥80.0Bil./Operating Income -¥50.0Bil., Cost reduction measures: ¥10Bil.

- Energy* Infrastructure Demand for both insulators and NAS® batteries is forecast to be weak, but aim to reduce the deficit through slimming down of overhead costs and removal of some unprofitable products.
- Ceramics Sales of passenger cars and trucks are assumed to significantly decrease due to COVID-19 and sales are expected to fall significantly. Income are expected to fall significantly as a result of increase in depreciation cost in addition to decrease in sales amount.
- Electronics Both sales and income are expected to remain at the same level as the previous period as a result of the weak demand for package products.
- Process technology Sales and income are expected to increase due to recovering demand against the backdrop of increasing investment in semiconductor equipment.

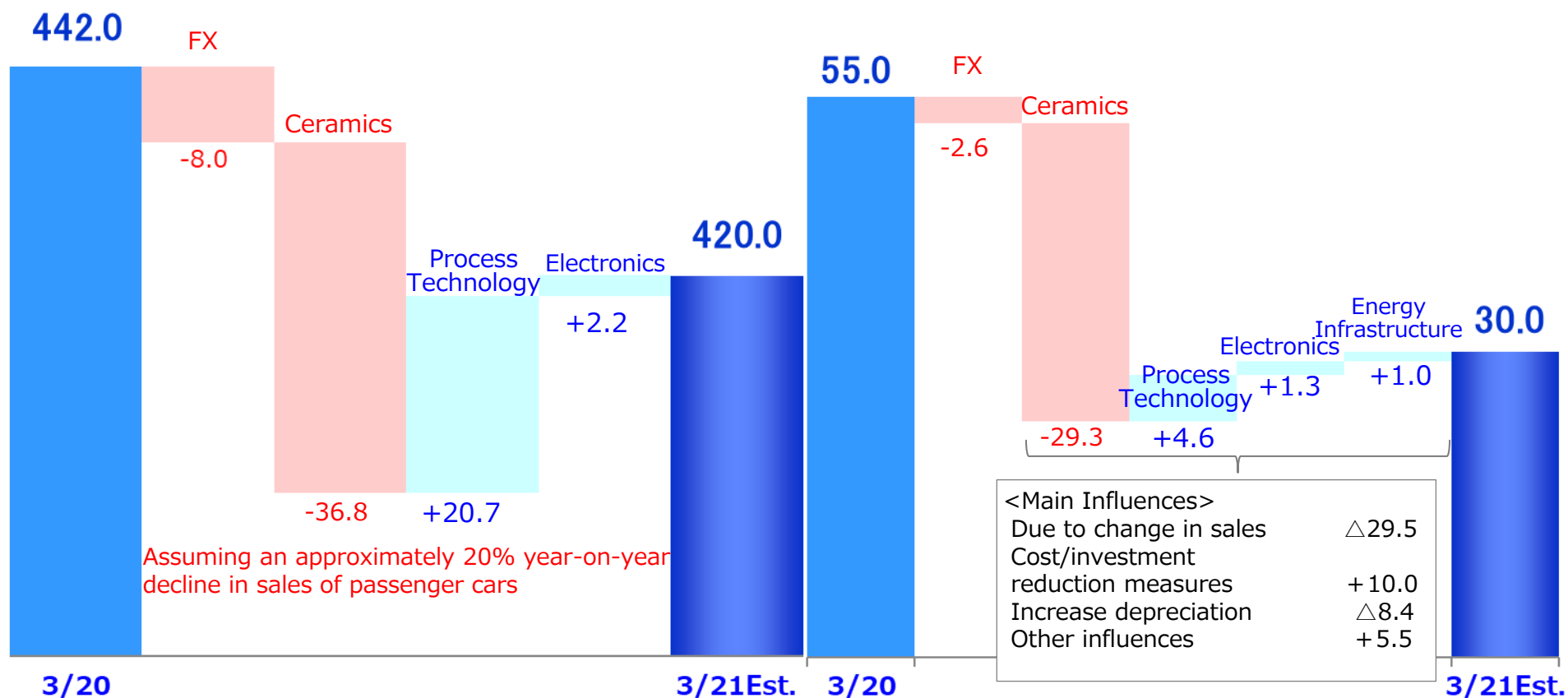
* FY2020 Power Business was renamed Energy Infrastructure Business

Change Analysis for FY2020

(¥ Bil.)

Sales

Op. Income



	3/20	3/21 Est.
FX Rate	¥109 /USD	¥105 /USD
	¥121 /EUR	¥115 /EUR

<Impact of FX rate per ¥1>

USD Sales	¥1.1Bil.	Operating Income	¥0.56Bil.
EUR Sales	¥0.6Bil.	Operating Income	¥0.07Bil.

Aim to strengthen the power system/power storage infrastructure business comprehensively by expanding the product lineup of power system insulators and NAS® batteries with the addition of Zinc Rechargeable Batteries for consumers.

● Insulators

- Domestically, electric utility companies will continue to restrain capital investment.
- With slimming down of overhead costs and removal of some unprofitable products, we expect a decrease in deficit.

● Energy Storage (NAS was renamed Energy Storage)

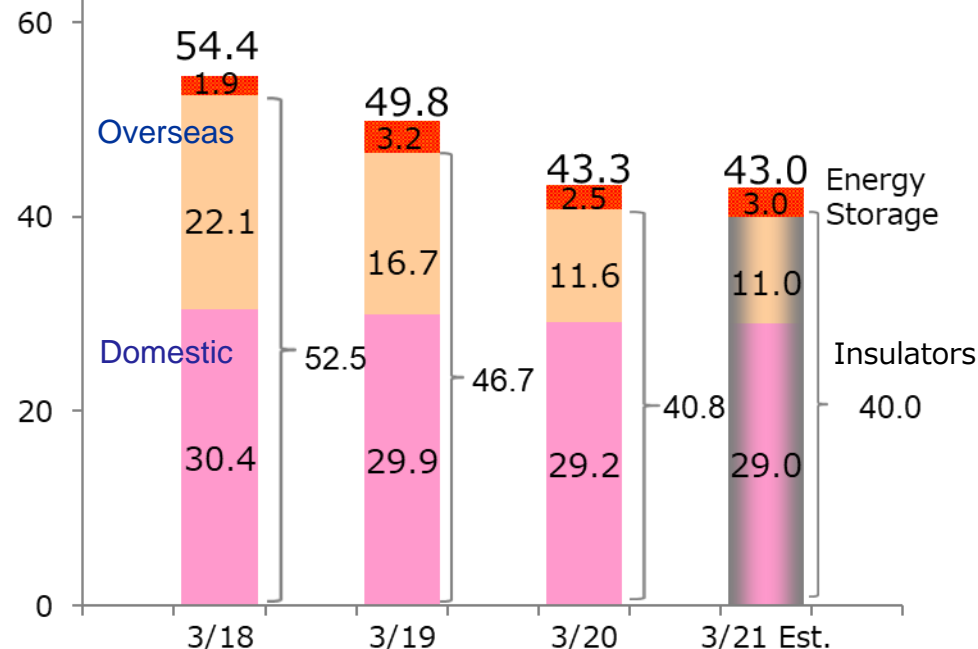
- A deficit is forecast to continue due to sluggish demand of domestic users.

*Impact of COVID-19: There are delays in the supply of some components, but the effects are minor.

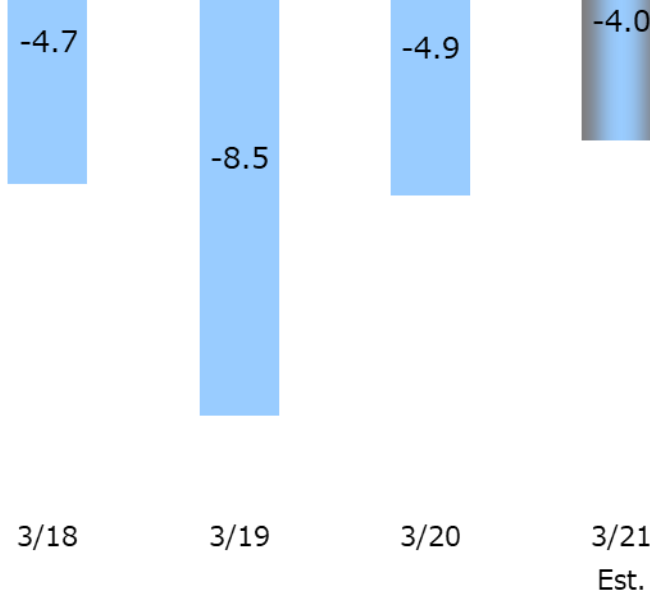
(¥ Bil.)

【Sales】

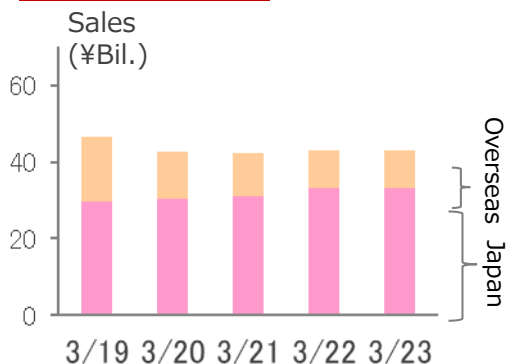
<After consolidation elimination>



【Operating Income(Loss)】



■ Insulators Aim to achieve an early turnaround



【 Market environment 】

Japan: In April 2020 along with power companies' separation of electrical power production from power distribution and transmission, power system reform is beginning to enter the final phase. Demand for replacing power equipment caused by age deterioration and for resilience measures are expected to increase despite ongoing trends among power companies toward restricting capital investment.

Overseas: New installation projects for Asia have been completed, but demand for replacement is expected to increase.

Aim to achieve an early turnaround by improving sales prices while pursuing business restructuring including slimming down of overhead costs and removal of some unprofitable products.

■ Energy Storage Aim for business expansion with NAS®Batteries and Zinc Rechargeable Batteries



NAS®Batteries

【 NAS®Batteries 】

Focus on receiving orders for domestic VPP deals and renewal deals for the time being, and also strengthen activities to capture the growing demand for storage batteries that is driven by the shift to long-lasting, large-capacity energy along with the progress of renewable energy introduction.

In overseas, pursue joint development and sales expansion in collaboration with BASF, and solidify the business foundation to become able to meet demand that is expected to grow in the future.

【 Zinc Rechargeable Batteries 】

While seeing increased attention on highly safe non-lithium ion batteries due to frequently occurred lithium ion battery fires, [acquired the world's first-ever UL verification mark* in the battery energy storage systems field.](#)

Receive more orders by raising the company's presence mainly among users who place importance on safety and security.



Zinc Rechargeable
Batteries

Promote the early commercialization of Zinc Rechargeable Batteries based on the expertise gained in relation to NAS®Batteries.

* As a result of testing based on c the UL 9540A standard by UL, an independent global safety science organization in the United States. (November 19,2019 released)

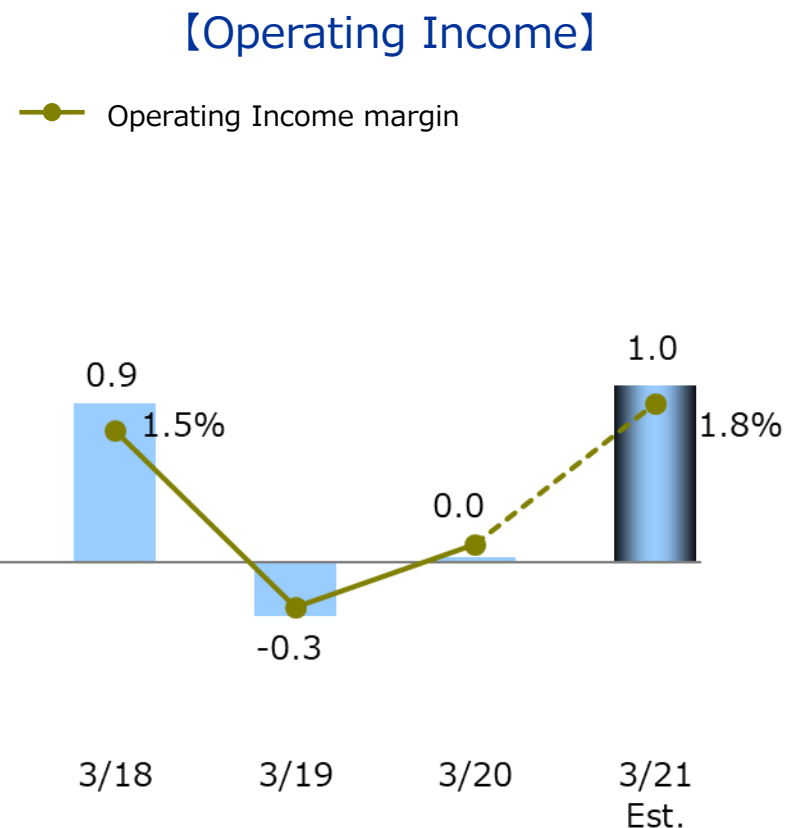
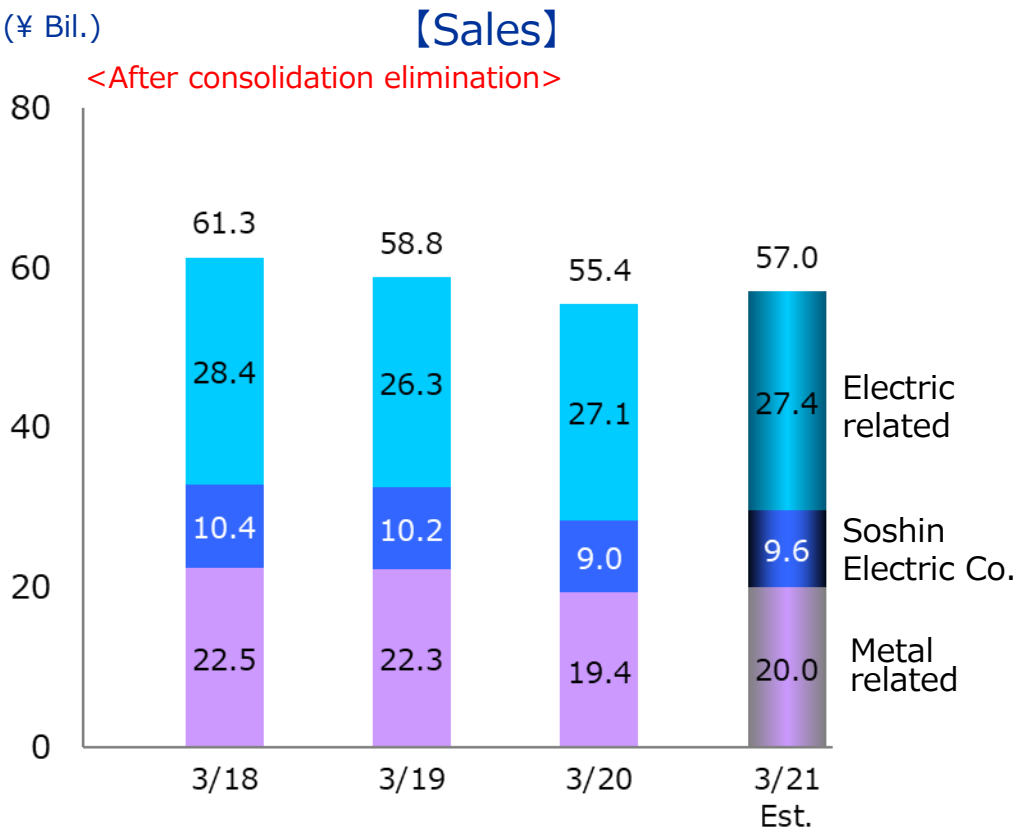
● Electronics Components

- Sales from wafer products are forecast to increase by stronger demand for high performance filter against the backdrop of advancements in communication systems such as 5G.
- Sales from piezoceramics actuators for HDD is forecast to increase due to increasing demand for large capacity HDDs driven by the recovery of data center investment.
- Regarding package products, demand for RF packages is forecast to remain sluggish.

● Metal Related Products

- Sales and profits are also forecast to remain at the same level as the previous period due to a slowdown demand for automobiles.

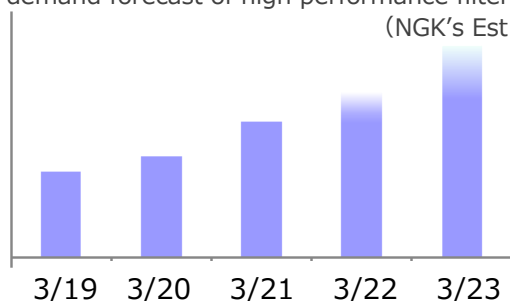
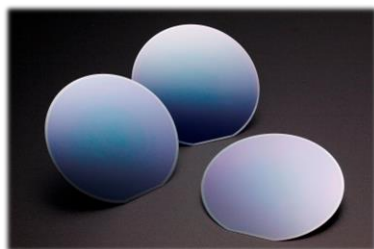
*Impact of COVID-19 : It reflects shipping decline due to declining global demand and corporate customers' reduced factory operations.



■ Bonded Wafer Products (Electronics Components)

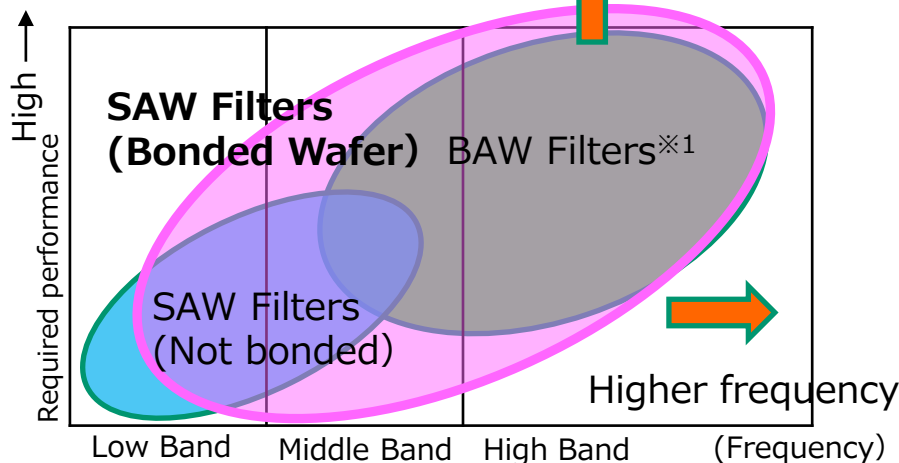
The market for composite wafer products for high-functionality SAW filters with an improved temperature profile, is forecast to expand at an annualized rate of 20% or more with the required performance level rises and the number of filters installed on mobile devices increases due to advancements in communication systems such as a widespread adoption of 5G.

(Total demand forecast of high performance filters)
(NGK's Est.)



NGK's Applicable domain of bonded wafer

Band gap - Narrow



(※1 BAW Filters

Filter with a complex structure that is produced in the thin film process)

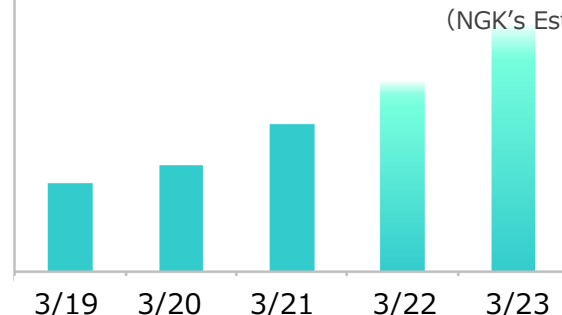
Increasing production capacity is ongoing to meet growing demand.

■ Piezoceramic Actuators for HDD(Electronic Components)

A piezoceramic actuators for large-capacity HDDs primarily used in nearline servers for data centers. With the spread of video data, IoT sensing, etc., the amount of generated data will increase an annualized rate of over 20%, and so mid- to long-term investment in data centers is expected to expand.



(Expected sales volume of HDDs used in near-line servers)
(NGK's Est.)



Increasing production capacity in Yamanashi and Malaysia is ongoing to meet growing demand

■ EnerCera® Chip-type Secondary Battery (Electronics Components)

A lithium-ion secondary battery that is small, thin, features a large capacity, and has high heat resistance, with a positive electrode material using crystal-orientation technology. Demand is expected to increase as the smart card and wearable terminal IoT device markets expand.



Strengthen marketing activities and reduce costs to generate sales and profits early.

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

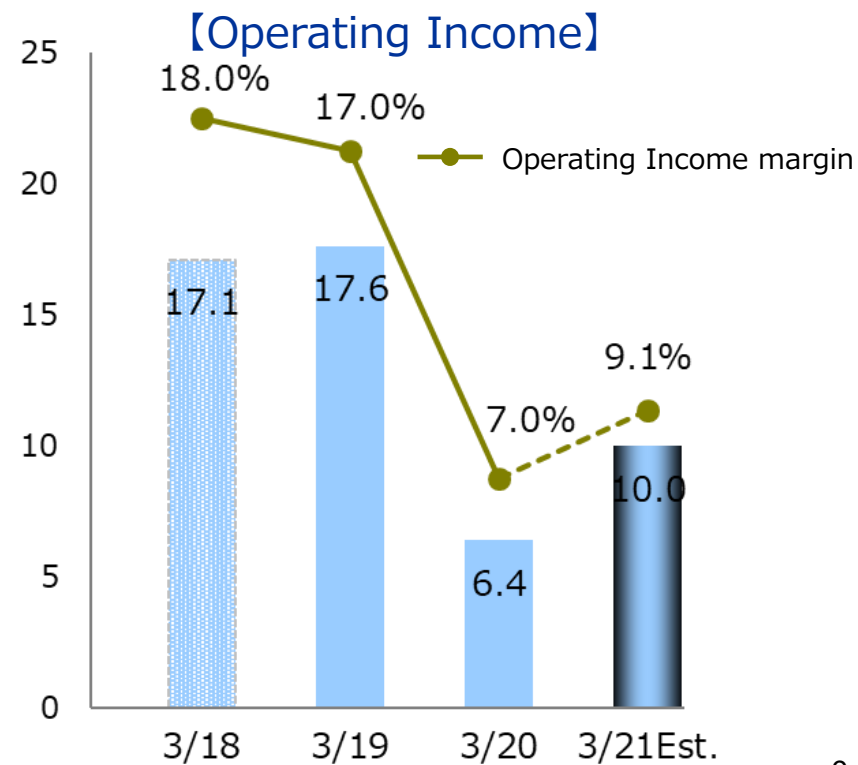
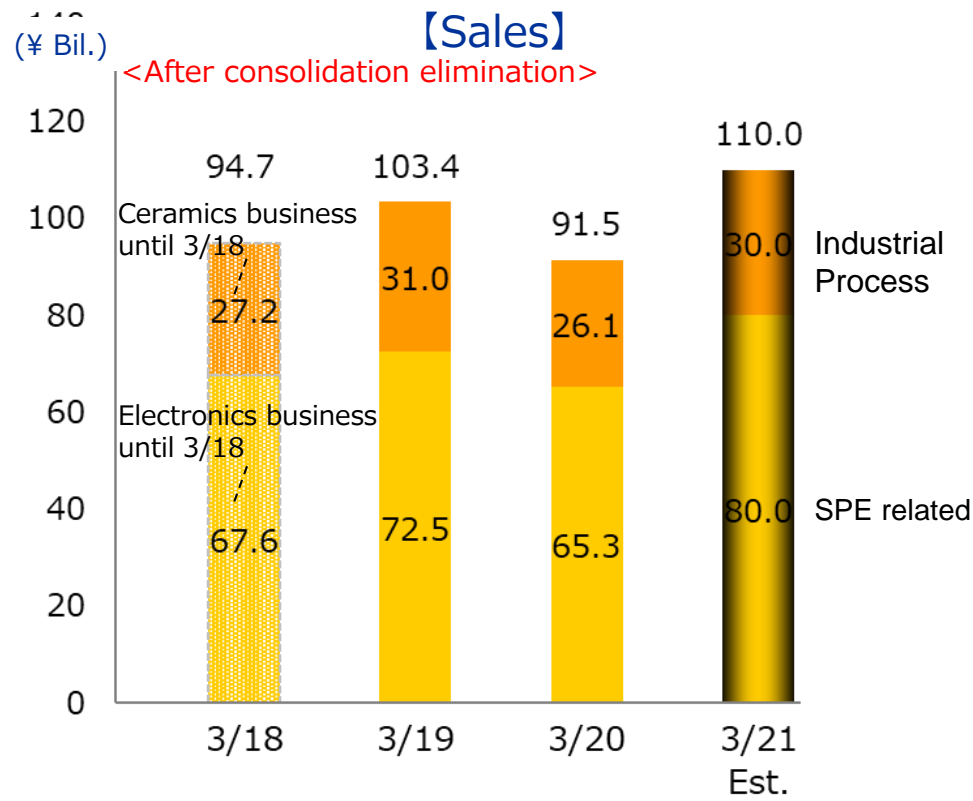
- Demand for products for semiconductor manufacturing equipment is forecast to recover due to increase capital expenditures for semiconductor equipment.

Higher sales are expected due to increasing in the sales amount, but profit is expected to increase moderately due to increased fixed cost such as depreciation expenses related to the Tajimi Plant.

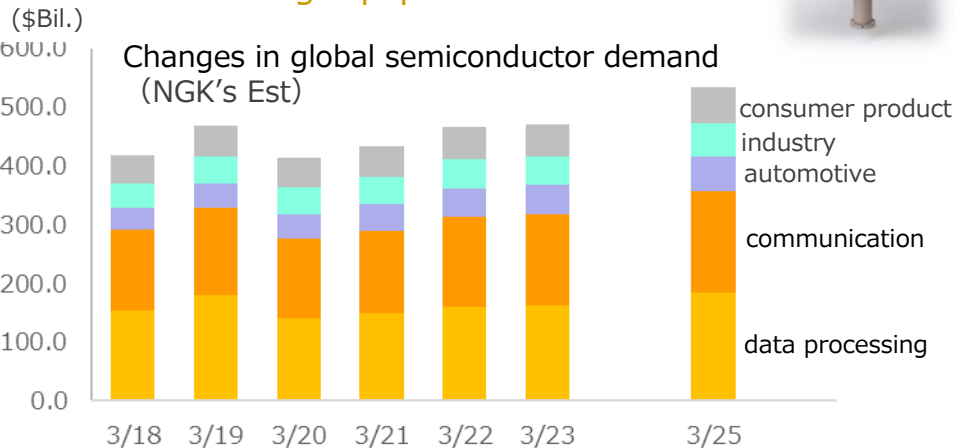
● Industrial processes

- Sales are expected to increase for such as projects of low-level radioactive waste disposal equipment.

*Impact of COVID-19: There are concerns such as delayed deliveries in the supply chain involving semiconductor manufacturing equipment makers, but the effects are considered minimal.



■ Ceramics Components for Semiconductor Manufacturing Equipment



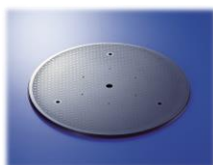
Semiconductor demand will continue to expand in the data processing sector and the communications sector as 5G communications are gaining ground. Multi-layered and microfabrication of semiconductors have been progressing.

NGK's Ceramics Components for Semiconductor Manufacturing Equipment

Susceptors



Heater (AlN)



Electrostatic chuck (Alumina, AlN)

Chamber components

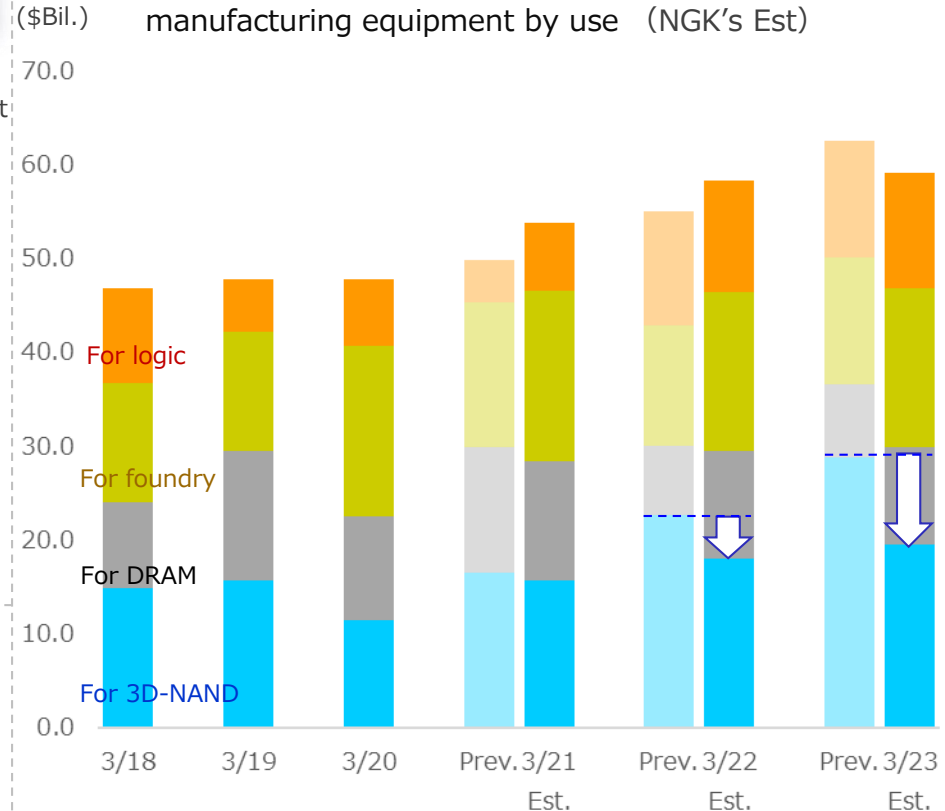


Chamber Components (Aluminum)



Chamber Components (Aluminum, thermal spraying)

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



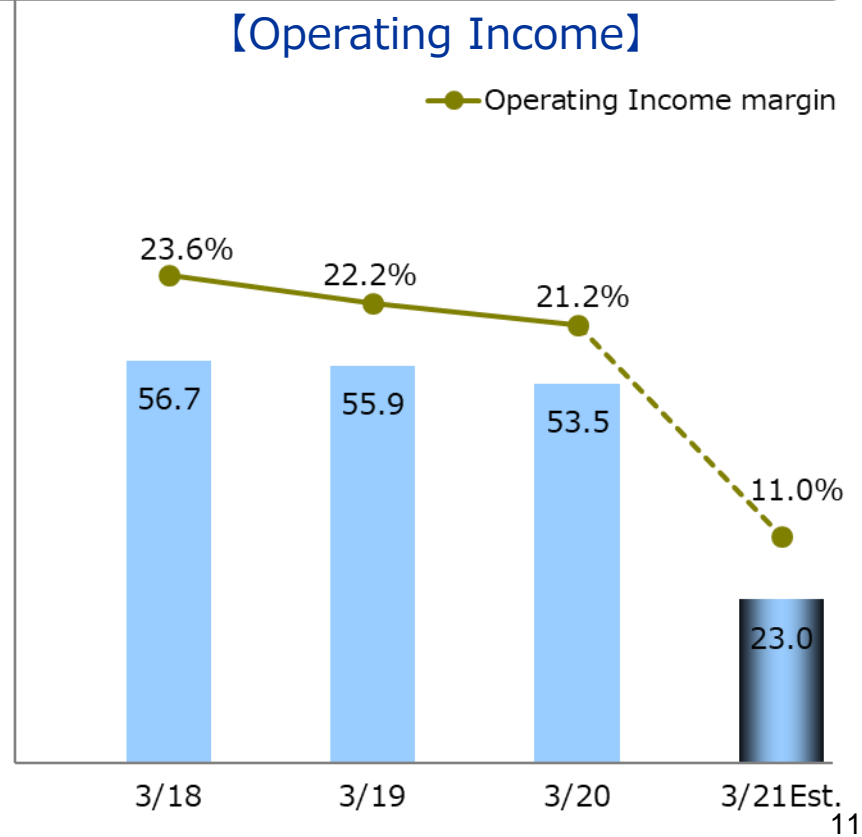
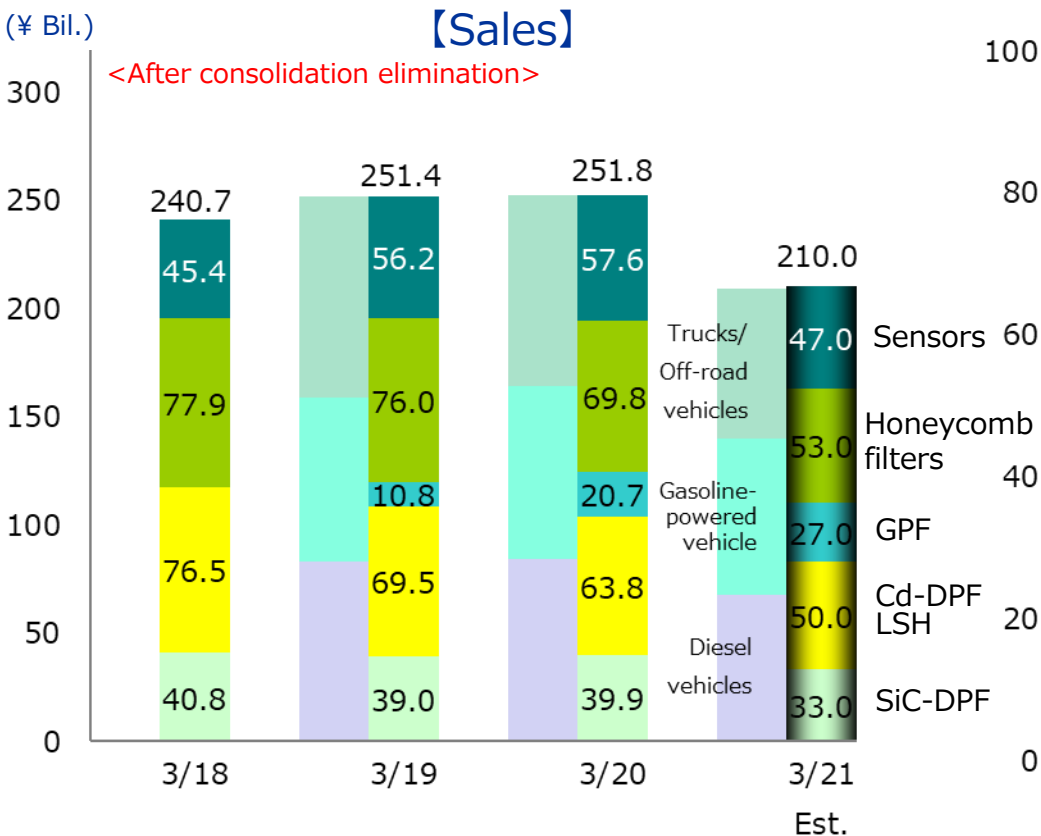
Our investment outlook shows a downward revision of investment in 3D NAND equipment as existing equipment will be continuously used to improve investment efficiency. However, equipment investment is expected to increase as a whole in the future along with increasing demand for semiconductors.

Aim to maximize profit by fully using the Tajimi Plant, whose operations are highly efficient, as the demand for NGK's components used for semiconductor manufacturing equipment is expected to increase.

- **Automotive-related**... Tightening emission regulations have continued while sales of passenger cars and trucks are assumed to significantly decrease due to Coronavirus (COVID-19) and the demand is expected to decrease. Income are expected to decrease significantly as a result of an increase in depreciation cost in addition to decrease in sales amount.

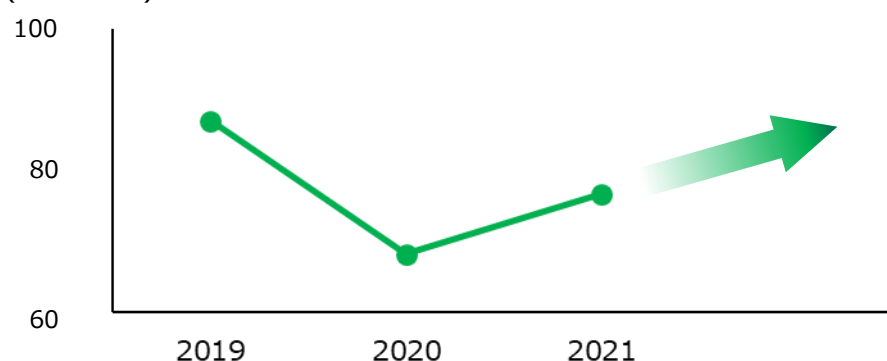
- GPF(For gasoline-powered vehicles) : Despite of a decrease in passenger car sales, demand for Europe and China will increase as a result of tighter emission regulations.
- Cd-DPF/LSH(For trucks) : Despite of tighter emission regulations in China and India, demand was decrease with a backdrop of reduced truck sales.
- SiC-DPF
(For diesel passenger vehicles/trucks) : Sales in European passenger car decreased and demand are forecast to decrease.
- Sensors
(For diesel passenger vehicles/trucks) : Despite of tighter emissions regulations in Europe, China and India, demand is forecast to decrease as a result of reduced sales in diesel vehicles and trucks.

*Impact of COVID-19: According to data from an outside agency, sales in passenger cars are assumed to decrease by approx.20% compared to the previous year. 1st half will see significant decrease in sales but 2st half will see recovery.

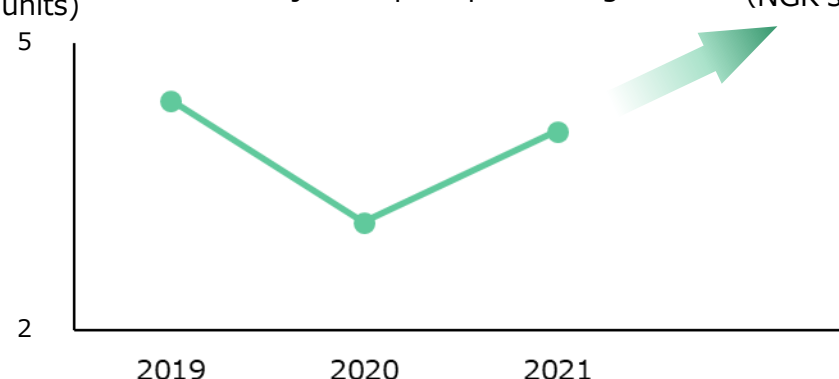


Forecast for Passenger Car Sales and Emission Regulations

〔Forecast for passenger car sales 〕
(mil. units) (NGK's Est.)



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



〔Forecast for emission regulations for passenger cars 〕
(NGK's Est.)

Product :



Honeycomb GPF SiC-DPF Sensors

	2019	2020	2021	2022	2023	2024	2025~	
Passenger cars	EU6d Temp	EU6d-Full					EU7	
		China6a (Urban)	China6a (All)			China6b (All)	China7	
	BS4	BS6 Stage I			BS6 Stage II			
		Euro5			Euro6			
					Euro6			EU7
	Tier 3 LEVⅢ					PM 1mg		
	PPNLT (WLTC)			Gasoline Engine RDE				

Passenger car sales will gradually recover. There have been no significant movement in mid-term emission regulations and The equipped ratio of GPF is expected to gradually increase mainly in China.

〔Forecast for emission regulations for trucks/off-road vehicles 〕
(NGK's Est.)

Product :



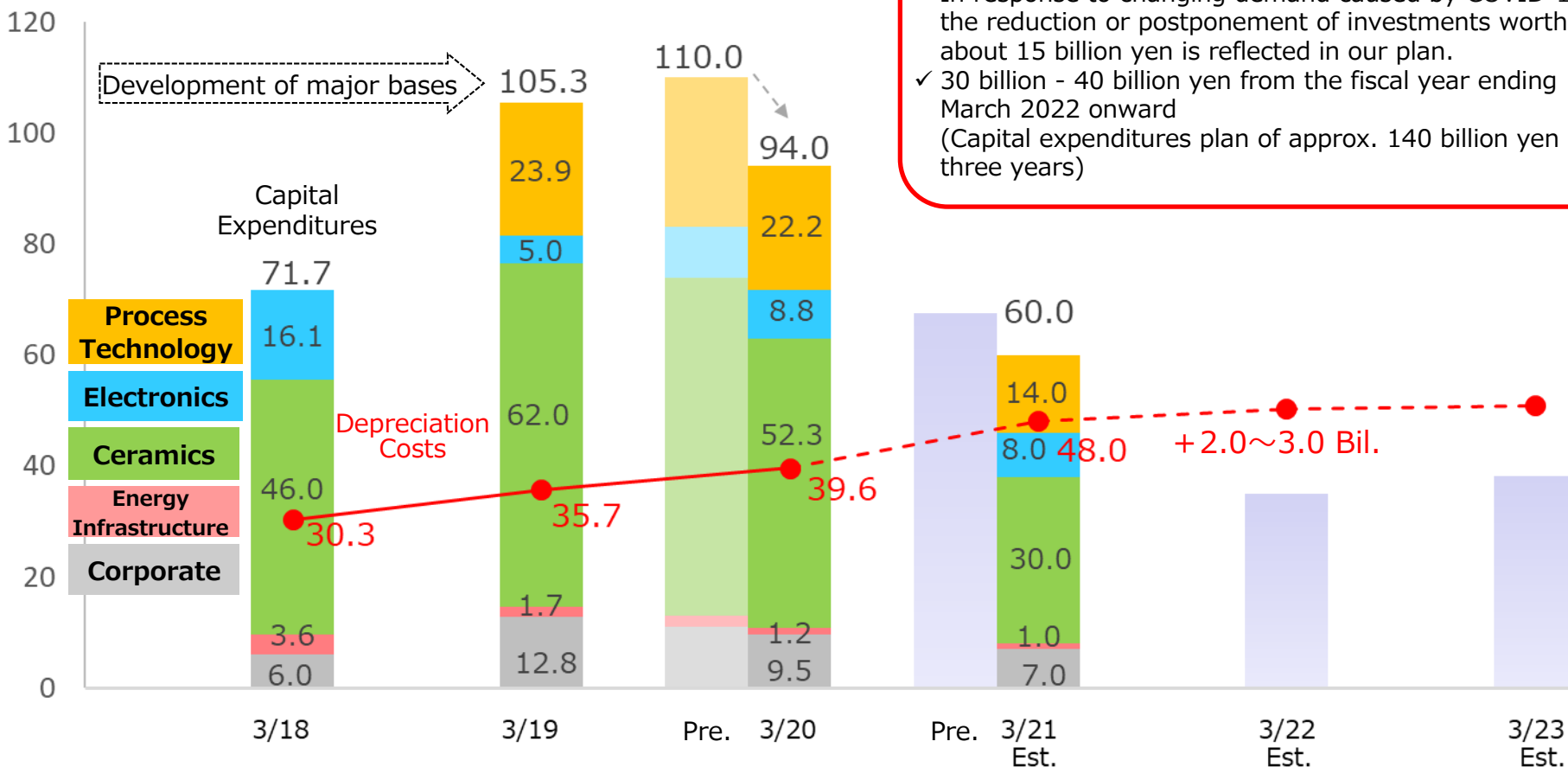
LSH Cd-DPF Sensors

		2019	2020	2021	2022	2023	2024	2025~	
Trucks	Europe	EU VI d				EU VI e			EU VI f
	China		China VI a (Urban)		China VI a (All)		China VI b (All)		China VI c
	India	BS IV	BS VI Stage I			BS VI Stage II			
	Brazil	EU V			EU VI				
	U.S.	US10					CARB Low-NOx		
	Japan	PPNLT							PPPNLT
Off-road Vehicles	Europe	Stage V							
	China	China III			China IV				
	India	TREM III CEV III		TREM IV CEV IV			TREM V CEV V		
	U.S.	Tier 4F							Tier 5
	Japan	Tier 4F							Tier 5

Although introduce of regulations in China is delayed in part, demand for truck/off-road vehicles are expected to increase due to tightened emission regulations in India, China and emerging countries.

Capital Expenditures & Depreciation Costs Presentation

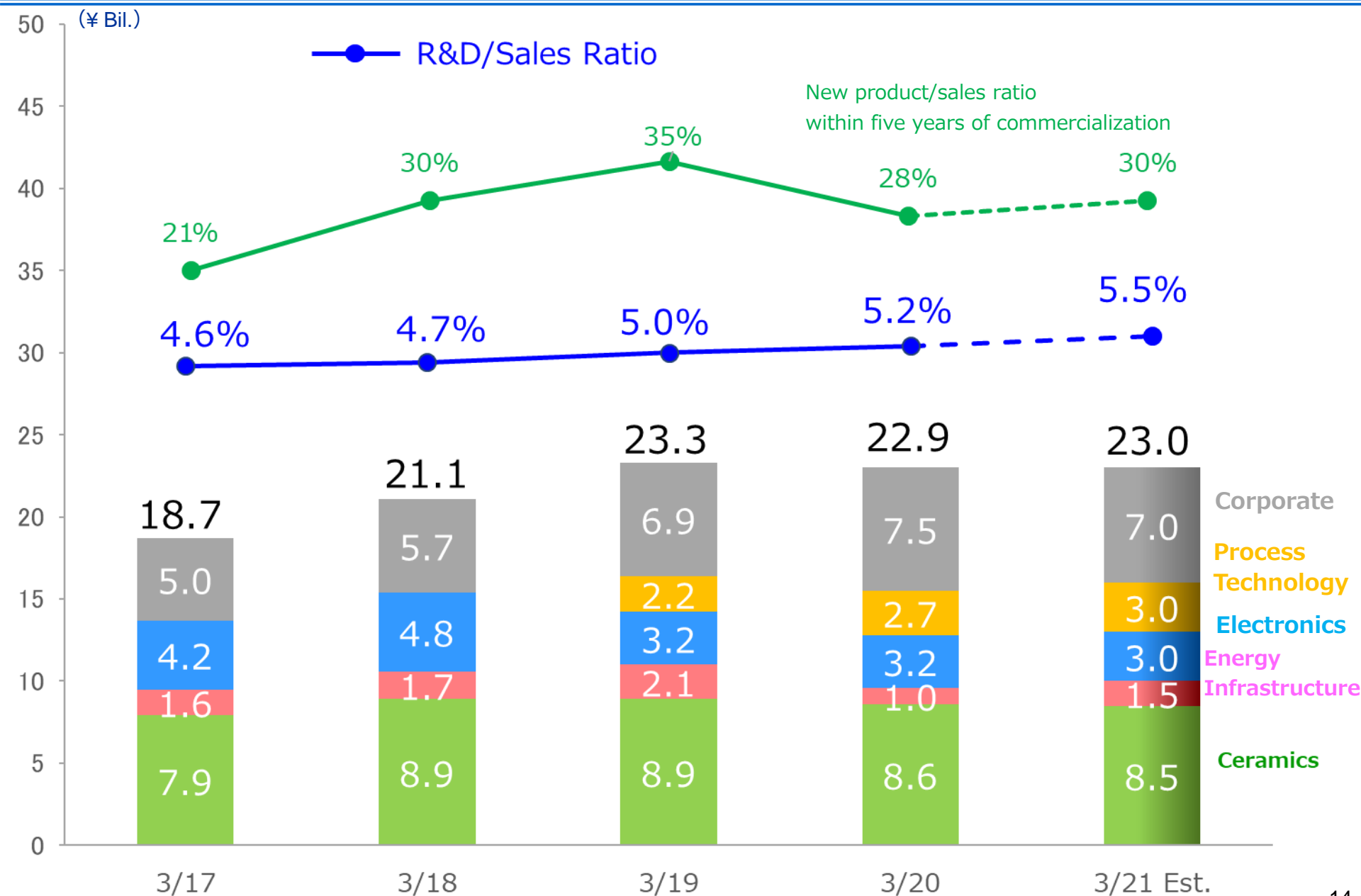
(¥ Bil.)



- ✓ 94 billion yen in the fiscal year ending March 2020.
- ✓ In response to changing demand caused by COVID-19, the reduction or postponement of investments worth about 15 billion yen is reflected in our plan.
- ✓ 30 billion - 40 billion yen from the fiscal year ending March 2022 onward
(Capital expenditures plan of approx. 140 billion yen over three years)

Komaki, Chita and Tajimi(Susceptors) : ¥40.0 Bil.
Tajimi Plant : Production started in October 2019.

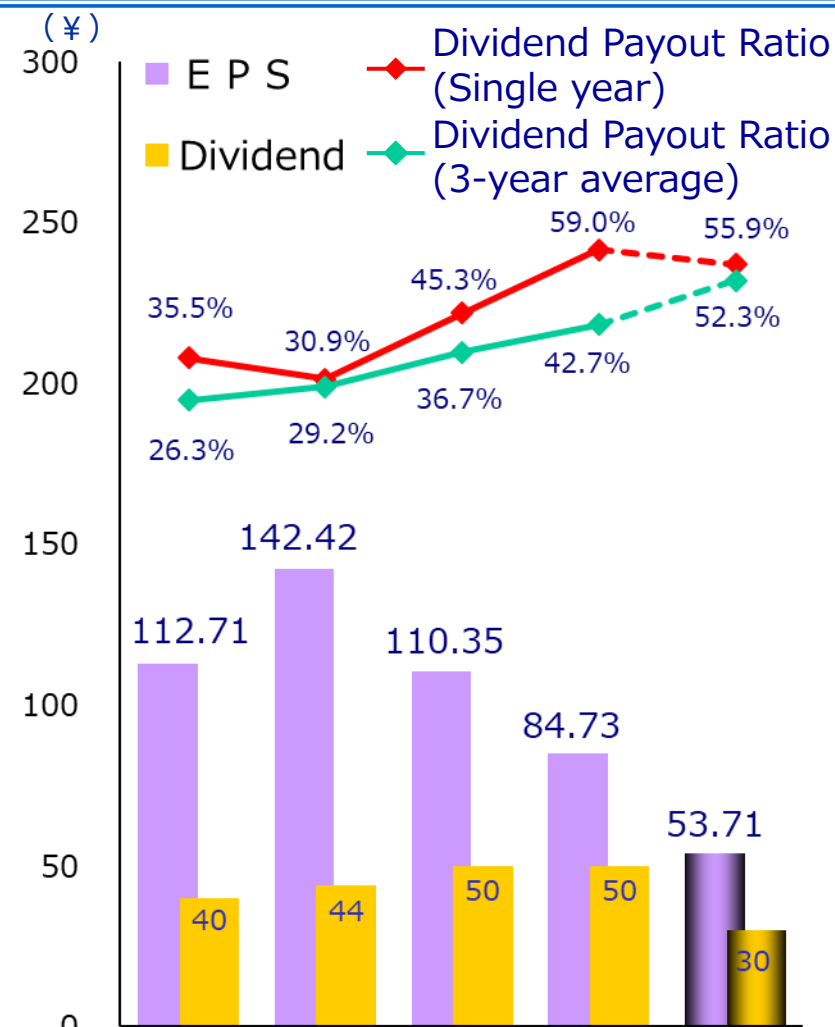
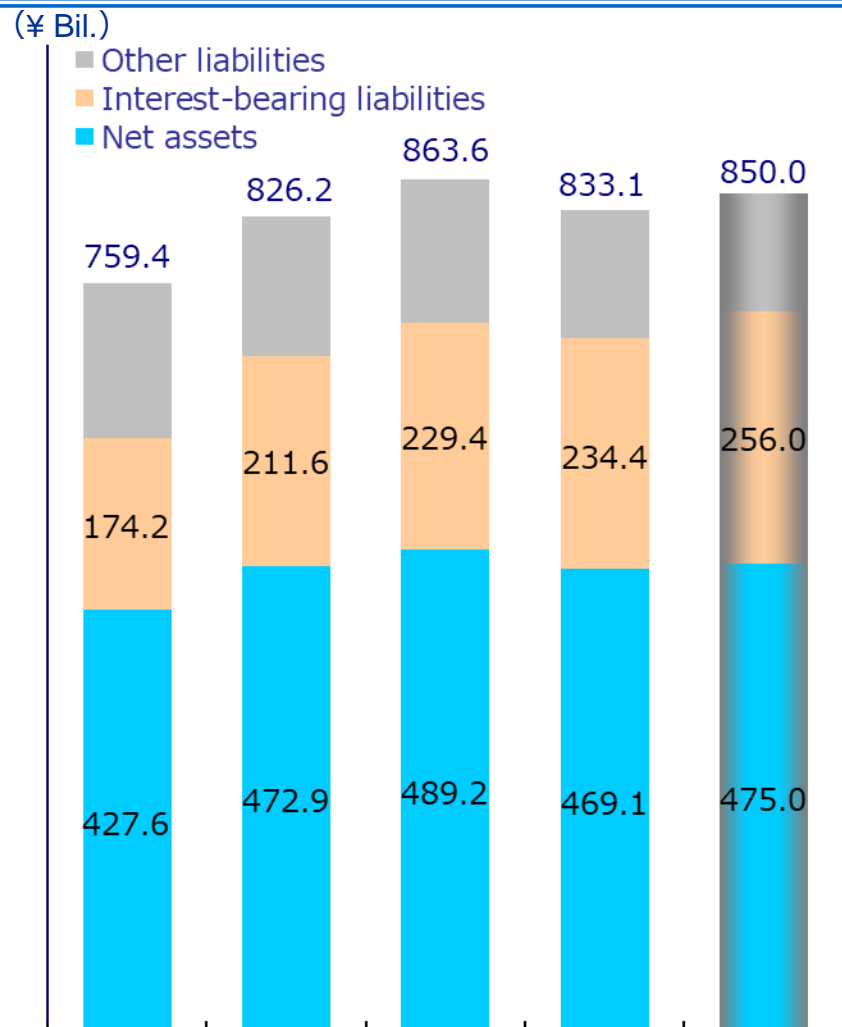
2nd plant in China(GPF) : ¥33.0 Bil.
Production started in December 2019.



Summary of Cash Flow

	3/19	3/20	3/21 Est.
Operating Activities	61.2	53.2	45.0
Investing Activities	-109.7 Investment -104.1	-60.8 Investment-95.4	-63.0 Investment -60.0
Financing Activities	3.6 New loans +31.9 Repayment -10.8	-18.8 New loans +37.0 Repayment -29.0 Treasury stock purchase -10.0	11.0 New loans +31.0 Repayment -9.0
Effect of Exchange Rate Changes on Cash & Cash Equivalents	-1.0	-2.9	0.0
Net Change in Cash & Cash Equivalents	-45.9	-29.3	-7.0
Cash & Cash Equivalents- at the End of Year	124.0	94.7	87.7

- With capital expenditure preceding, interest-bearing liabilities will exceed outstanding funds for a while.
- Free cash flow is forecast to turn positive in FY ending March 2022.



ROE	8.8%	10.4%	7.6%	5.8%	3.7%
DE Ratio	0.42	0.46	0.48	0.51	0.55

DOE	3/17	3/18	3/19	3/20	21/3 Est.
Single year	3.1%	3.2%	3.4%	3.4%	2.1%
3-year average	2.9%	3.2%	3.3%	3.4%	3.0%

Equity ratio of 50% or higher will be maintained.

Sales by Product (Annual)

(¥ Bil.)

FY 2020
Presentation

<After Consolidation Elimination>	3/18	3/19	3/20	3/21Est.
Insulators	52.5	46.7	40.8	40.0
Energy Storage	1.9	3.2	2.5	3.0
Energy Infrastructure	54.4	49.8	43.3	43.0
Honeycomb filters	77.9	76.0	69.8	53.0
GPF	76.5	10.8	20.7	27.0
Cd-DPF / LSH		69.5	63.8	50.0
SiC-DPF	40.8	39.0	39.9	33.0
Sensors	45.4	56.2	57.6	47.0
Ceramics Business	240.7	251.4	251.8	210.0
Metal related	22.5	22.3	19.4	20.0
Electric related	28.4	26.3	27.1	27.4
Soshin Electric CO.	10.4	10.2	9.0	9.6
Electronics Business	61.3	58.8	55.4	57.0
Industrial Process	27.1	31.0	26.1	30.0
SPE related	67.6	72.5	65.3	80.0
Process Technology Business	94.7	103.4	91.5	110.0
Total	451.1	463.5	442.0	420.0

Sales by Product (Semi Annual)

<After Consolidation Elimination>	3/20		3/21 Est.	
	1 st . Half	2 nd . Half	1 st . Half	2 nd . Half
Insulators	20.2	20.5	19.0	21.0
Energy Storage	0.4	2.1	1.0	2.0
Energy Infrastructure	20.6	22.7	20.0	23.0
Honeycomb filters	37.2	32.7	24.0	29.0
GPF	9.3	11.4	13.0	14.0
Cd-DPF / LSH	34.2	29.7	21.0	29.0
SiC-DPF	18.8	21.1	14.0	19.0
Sensors	28.8	28.8	20.0	27.0
Ceramics Business	128.2	123.6	92.0	118.0
Metal related	9.9	9.5	9.0	11.0
Electric related	14.0	13.1	11.5	15.9
Soshin Electric CO.	4.4	4.6	4.5	5.1
Electronics Business	28.3	27.2	25.0	32.0
Industrial Process	12.9	13.3	16.0	14.0
SPE related	29.8	35.5	37.0	43.0
Process Technology Business	42.7	48.8	53.0	57.0
Total	219.8	222.2	190.0	230.0

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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