FY2022 Results
(From April 1, 2022 to March 31, 2023)

This is a translation of materials used for the analyst meeting held online, Japan on April 28, 2023

President
Shigeru Kobayashi

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 FY2022
( Ended March 31, 2023)

Forecasts for FY2023
( Ending March 31, 2024)

Forecasts for Each Business Segment

Improving Enterprise Value

R&D/ Capital Expenditures & Depreciation Costs

Capital Policy/ Total Assets & Dividend/ Summary of Cash Flow

Increase Non-Financial Value by Promoting ESG Management
### Summary of Financial Results for FY2022

<table>
<thead>
<tr>
<th></th>
<th>FY2021 (Bln. Yen)</th>
<th>FY2022 (Bln. Yen)</th>
<th>YOY Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net sales</strong></td>
<td>510.4</td>
<td>559.2</td>
<td>+37.9 (+10%)</td>
</tr>
<tr>
<td><strong>Operating Income</strong></td>
<td>83.5</td>
<td>66.8</td>
<td>+15.5 (20%)</td>
</tr>
<tr>
<td><strong>Ordinary Income</strong></td>
<td>86.2</td>
<td>65.9</td>
<td>(24%)</td>
</tr>
<tr>
<td><strong>Net income Attributable to Owners of the Parent</strong></td>
<td>70.9</td>
<td>55.0</td>
<td>(22%)</td>
</tr>
</tbody>
</table>

**Exchange Rate**

<table>
<thead>
<tr>
<th></th>
<th>USD</th>
<th>EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2021</td>
<td>113 yen</td>
<td>131 yen</td>
</tr>
<tr>
<td>FY2022</td>
<td>135 yen</td>
<td>141 yen</td>
</tr>
</tbody>
</table>

**Income Decreased Year on Year, Despite Record-High Sales due to the Effect of the Weak Yen**

- **Environment**: Although there was the impact of restrictions on economic activities in China, shipments remained firm, and sales increased due to the effect of the weak yen. Income declined due to soaring labor costs, raw material and fuel prices caused by inflation.

- **Digital Society**: While sales increased due to the positive effect of the weak yen, income declined as a result of a decline in demand against the background of not only sluggish sales of smartphones but also stagnant investment in semiconductors that became obvious from the second half of the fiscal year as well as shrinking investment in data centers.

- **Energy & Industry**: Sales increased due to stronger demand for firing furnaces for positive electrode materials for lithium-ion batteries and the effect of the weak yen.

- **Extraordinary Loss**: Recorded extraordinary loss accompanying the optimization of production capacity in the Environment Business.

- **Net Income**: Recorded income taxes-refund and the reversal of estimates related to transfer price taxation (a total of 11.8 billion yen).
Change Analysis for FY2022

Sales

- Sales
- Op. Income
- FX Rate

<table>
<thead>
<tr>
<th>FX Rate</th>
<th>USD 113 yen</th>
<th>EUR 131 yen</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2021</td>
<td>135 yen</td>
<td>141 yen</td>
</tr>
<tr>
<td>FY2022</td>
<td>113 yen</td>
<td>131 yen</td>
</tr>
</tbody>
</table>

Op. Income

- Environment
- Digital Society
- Energy & Industry

<table>
<thead>
<tr>
<th>FX Rate</th>
<th>USD 113 yen</th>
<th>EUR 131 yen</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2021</td>
<td>+37.9</td>
<td>+6.3</td>
</tr>
<tr>
<td>FY2022</td>
<td>+15.5</td>
<td></td>
</tr>
</tbody>
</table>

Breakdown

- Rising raw material and energy cost: -24.0
- Sales price revision: +5.0
- R&D and depreciation costs increase: -7.1
- Shipment: -3.6
- Others: -2.6
Forecasts for FY2023

<table>
<thead>
<tr>
<th></th>
<th>FY2022</th>
<th>FY2023</th>
<th>YOY Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net sales</strong></td>
<td>559.2</td>
<td>565.0</td>
<td>(6.9) +1%</td>
</tr>
<tr>
<td><strong>Operating Income</strong></td>
<td>66.8</td>
<td>56.0</td>
<td>(0.8) (16%)</td>
</tr>
<tr>
<td><strong>Ordinary Income</strong></td>
<td>65.9</td>
<td>53.0</td>
<td>(20%)</td>
</tr>
<tr>
<td><strong>Net income Attributable to Owners of the Parent</strong></td>
<td>55.0</td>
<td>38.5</td>
<td>(30%)</td>
</tr>
</tbody>
</table>

*Exchange Rate*

- USD: 135 yen to 130 yen (5 yen)
- EUR: 141 yen to 140 yen (1 yen)

**YOY Sales Will Increase; Income Will Decrease**
The Environment Business Remains Firm, the Performance of the Digital Society Business Will be Poor in the First Half

- **Environment**
  Sales will increase due to an increase in demand for various products resulting from more strict emission standards, coupled with a recovery in automotive production against the background of an easing of component shortages including semiconductors. Income is expected to remain almost unchanged from the previous fiscal year due to higher labor costs, raw material and fuel prices caused by inflation.

- **Digital Society**
  Although the electronics market is expected to recover gradually from the second half of the fiscal year, a sales increase and an income decline are projected since the demand decline in the first half will weigh heavily.

- **Energy & Industry**
  Sales are expected to increase, and income is forecast to improve, as a whole, primarily due to the price revision of insulators in addition to a rise in demand for industrial heating systems for Lithium-ion battery cathode materials.
Change Analysis for FY2023

Sales

- Environment +17.8
- Energy & Industry +8.0
- Digital Society (13.2)
- Forex (6.9)

Op. Income

- Environment +0.2
- Energy & Industry (11.7)
- Digital Society +1.5
- Forex (0.8)

Breakdown:

- Rising raw material and energy cost -17.0
- Sales price revision +4.0
- R&D and depreciation costs increase -8.1
- Shipment +6.3
- Others +4.8

FX Rate

<table>
<thead>
<tr>
<th>USD</th>
<th>EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>135 yen</td>
<td>141 yen</td>
</tr>
</tbody>
</table>
Forecasts for the Environment Business

- **Automotive related**
  Demand for each product is expected to increase because of a higher GPF installation rate due to stricter emission standards in China (China 6b), a gradual recovery in component supply issues, particularly the shortage of semiconductors, and an increase in global passenger car sales. While truck sales in China are expected to remain at the same level as the previous fiscal year, demand for products centered on SiC-DPF is projected to expand due to China’s stricter off-road emission standards (China IV). Income is projected to grow only slightly from the previous year due to the impact of rising labor costs, raw material and fuel prices caused by inflation despite the effort to maximize cost reductions and sales price revisions in addition to larger volumes.

- **Honeycomb filters/GPF** (for gas passenger vehicles)
  - Demand is expected to increase mainly due to a recovery in passenger car sales and stricter regulations.

- **SiC-DPF** (for diesel passenger vehicles/trucks)
  - Demand is expected to increase due to a recovery in passenger car sales and China’s stricter non-road emission standards.

- **Sensors** (for diesel passenger vehicles/trucks)
  - Sales are projected to increase mainly due to price revisions coupled with a significant year-on-year increase in volumes as customers end their inventory adjustments.

- **Cd-DPF/LSH** (for trucks)
  - Volume will remain at the same level as the previous fiscal year but income will decrease due to the effect of the assumption that the yen remained high.

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**[Sales]**

<table>
<thead>
<tr>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
</tr>
</thead>
<tbody>
<tr>
<td>248.9</td>
<td>292.7</td>
<td>320.8</td>
<td>335.0</td>
</tr>
</tbody>
</table>

<After consolidation elimination>

**[Op. Income]**

<table>
<thead>
<tr>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
</tr>
</thead>
<tbody>
<tr>
<td>41.2</td>
<td>65.1</td>
<td>50.7</td>
<td>51.0</td>
</tr>
</tbody>
</table>

- **GPF**
  - Gas vehicles: 33.9
  - Diesel vehicles: 79.0

- **Honeycomb filters**
  - Gas vehicles: 63.7
  - Diesel vehicles: 63.7

- **SiC-DPF**
  - Gas vehicles: 59.2
  - Diesel vehicles: 58.7

- **Sensors**
  - Gas vehicles: 33.2
  - Diesel vehicles: 53.3

- **Cd-DPF/LSH**
  - Gas vehicles: 59.2
  - Diesel vehicles: 78.3

Op. Income margin:
- FY20: 16.5%
- FY21: 22.2%
- FY22: 15.8%
- FY23: 15.2%

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The European Commission has announced a draft of the new Euro 7 standards that will be introduced in 2025. Demand for NOx sensors for gasoline that we are developing is expected to start rising as NOx emissions will also have to be measured at all times with gasoline engines.

We assume that demand for combustion engine vehicles will fall as the ratio of EV to all automobiles will rise compared to last October. Therefore, we have decided to record an impairment loss of idle facilities as a result of a productivity improvement and terminate production in sites that will have difficulty in remaining profitable in the future.

Market launch in 2025 Capture demand without fail while proceeding to optimize the production system.
Forecasts for the Digital Society Business

- SPE Related (Components for semiconductor production equipment)
  - Demand for semiconductors has slowed down as the poor performance of the U.S. major tech industry has become obvious amid a prolonged slump in smartphone and PC sales. Business conditions in the semiconductor equipment market also have worsened as major semiconductor manufacturers too reduced production and postponed capital investment. Demand for products of NGK is expected to fall sharply in the first half of the fiscal year. On a full-year basis, sales and income are expected to decrease considerably due to the impact of the significant decline in the first half of the fiscal year although demand will gradually rise in sync with a market recovery that will start in the second half.

- Electronic Components
  - Both sales and income of piezoceramic actuators for HDDs are expected to reach the same level as the previous fiscal year as demand will recover gradually toward the second half, although demand is weak due to hyperscalers’ curtailment of investment in data centers.
  - Ceramic packages for crystals are expected to be at the same level as the previous fiscal year, as a whole, due to a fall in demand resulting from sluggish sales of smartphones despite a rise in demand for short distance wireless communication and automotive use.

- Metal Related
  - Although shipment volume will remain unchanged from the previous fiscal year, sales will decline due to fluctuations in copper prices. Income is expected to decline due to a concentration of equipment-related expenses in this period.

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![Sales and Operating Income Graphs](chart.png)

- **Sales**
  - Reference based on the current organizational structure
  - After consolidation elimination

- **Operating Income**
  - Reference based on the current organizational structure

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23 FCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>127.3</td>
<td>150.3</td>
<td>163.2</td>
<td>147.0</td>
</tr>
<tr>
<td>Electronic Components</td>
<td>80.1</td>
<td>96.9</td>
<td>107.0</td>
<td>92.0</td>
</tr>
<tr>
<td>Metal Related</td>
<td>19.3</td>
<td>23.9</td>
<td>27.6</td>
<td>27.0</td>
</tr>
<tr>
<td>SPE Related</td>
<td>27.9</td>
<td>29.5</td>
<td>28.6</td>
<td>28.0</td>
</tr>
<tr>
<td><strong>Op. Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY20</td>
<td>14.6</td>
<td>19.9</td>
<td>17.6</td>
<td>5.0</td>
</tr>
</tbody>
</table>

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The future perspective for the DS Business

Against the backdrop of a macroeconomic deterioration, investment in semiconductors and data centers has remained held down since the second half of 2022. Although there are downside risks mainly due to restrictions on exports to China and the continued inflation, demand for semiconductors and high-capacity HDD storage will pick up from the second half of 2023. Consequently, demand for products of NGK is forecast to rise. Furthermore, from 2024, NGK expect business growth at an annual average of 10% or more as demand for our telecommunications-related products and EV-related products will expand, too.

Demand for our products was driven by investments in semiconductors and data centers behind the trend of various industries adopting IoT. • Curtailment of investment in data centers in the face of an economic downturn
• Tightening of U.S. export controls

Progress to be made in digitization of society CAGR more than 10%

(bln. Yen)

FY21 FY22 FY23 FY24 FY25
1st Half 71.5 11.7 14.0 45.8 0.0
2nd Half 78.8 12.2 15.5 51.1 20.0

(bln. Dollar)

FY21 FY22 FY23 FY24 FY25
1st Half 88.2 16.4 12.2 59.0 0.0
2nd Half 83.0 14.9 12.2 47.9 20.0

Metal related

Electronic Components

Electronic Components

SPE related

Components for semiconductor manufacturing equipment (SPE)

(NGK’s forecast for the demand of SPE related)

Investment trends in semiconductor manufacturing equipment for front-end process by application (Estimated by SEMI in March)

We assume a further downward change of WFE against the SEMI forecast.

Capture demand through facility expansion and reinforcement

Piezoceramic Actuators for HDD (Electronic Components)

(NGK’s Est.)

(Mil. Units)

For 3D NAND

For DRAM

For Foundry/Logic

Groups of electronic devices that we expect to grow

Composite wafer products for high-functionality SAW filters with an improved temperature profile.

Ceramic packages used for crystal devices, CMOSRF, etc.

Ceramic circuit boards for power modules for automobiles and industrial equipment with superior reliability and heat conduction.

NGK’s forecast for the demand of SPE related

Capture demand through facility expansion and reinforcement

Demand for our products was driven by investments in semiconductors and data centers behind the trend of various industries adopting IoT.

• Curtailment of investment in data centers in the face of an economic downturn
• Tightening of U.S. export controls

Progress to be made in digitization of society CAGR more than 10%
Forecasts for the Energy & Industry Business

**Insulators**
- Despite a decline in the export business, we expect sales and income to remain almost unchanged from the previous fiscal year through implementing sales price revisions, which will ensure that business is in the black.
- Insulators produced in the Chita Site had faced the situation where insulator products for domestic substations were rapidly changing from ceramic insulators to polymer ones, in addition to fierce competition with overseas competing manufacturers. Against this background, in March, 2023 NGK has concluded that a recovery in earnings is difficult and decided to phase out the production and sales of insulator products over the coming few years.

**Energy Storage**
- Although shipments will increase for domestic and overseas users, the deficit is expected to persist due to soaring raw material and fuel prices.

**Industrial Processes**
- Sales and income are expected to grow primarily due to an increase in demand for industrial heating systems for Lithium-ion battery cathode materials and disposal equipment for low-level radioactive waste.

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**Sales**

Reference based on the current organizational structure

<table>
<thead>
<tr>
<th></th>
<th>Insulators</th>
<th>Energy Storage</th>
<th>Industrial Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY20</td>
<td>39.1</td>
<td>2.8</td>
<td>69.0</td>
</tr>
<tr>
<td>FY21</td>
<td>39.3</td>
<td>1.3</td>
<td>67.5</td>
</tr>
<tr>
<td>FY22</td>
<td>44.2</td>
<td>2.7</td>
<td>75.3</td>
</tr>
<tr>
<td>FY23</td>
<td>44.5</td>
<td>5.0</td>
<td>83.0</td>
</tr>
<tr>
<td>FCT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<After inter-segment elimination>

**Op. Income**

Reference based on the current organizational structure

<table>
<thead>
<tr>
<th></th>
<th>Insulators</th>
<th>Energy Storage</th>
<th>Industrial Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY20</td>
<td>(4.9)</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>FY21</td>
<td>(1.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY22</td>
<td>(1.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The future perspective for the E&I Business

NAS® batteries (Energy storage)

In response to the greater utilization of storage batteries in the wake of spreading adoption of renewable energy, NGK aims to raise the presence of NAS batteries by capturing orders for overseas projects and building a business model that helps boost the adoption of renewable energy in Japan.

Business start of joint venture NR-Power Lab Co., Ltd.

Provide services for the popularization of renewable energy by combining our storage battery control technology with the renewable energy distribution recording platform possessed by Ricoh Company, Ltd.

We aim to commercialize the VPP service and electric power digital service for carbon neutrality in communities and corporations at an early stage.

Sales expansion to overseas markets through sales alliance with BASF

As the adopted volume of renewable energy rises, storage batteries will take over the central role in renewable energy reserve from gas-fired power generation, and demand for long-hour storage batteries will expand in and after 2025. At the same time, potential demand for “everyday/100%/continuous/full charge-discharge” applications that can bring out the strength of NAS batteries is expected to increase. NGK will utilize the sales alliance with BASF, thereby aiming to win and increase orders for overseas large projects mainly for application of storage batteries attached to renewable energy facilities.

Storage battery market and target for NAS batteries

<table>
<thead>
<tr>
<th>Storage battery market</th>
<th>Applications for large storage batteries</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power sources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stable power sources (thermal, hydraulic, etc.)</td>
<td>Time shifting for adjustment</td>
<td>Overseas</td>
</tr>
<tr>
<td>Renewable energy (Wind, solar etc.)</td>
<td>Storage business (Demonstration phase in Japan)</td>
<td>Overseas</td>
</tr>
<tr>
<td>Grid-scale battery</td>
<td>Easing of congestion in systems</td>
<td>Japan</td>
</tr>
<tr>
<td>Substations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business and industry use</td>
<td>Peak cut BCP Decarbonization DR-VPP</td>
<td>Japan</td>
</tr>
<tr>
<td>Customers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home use</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Energy resources

- **NGK Insulators**
  - Regional power provider
  - Customers

- **Ricoh Company Eco Business Development Center**

Partners

- Operate as VPP in combination with IoT technology
- Avoid imbalance, Trading based on price difference, Electric power reserve market, Output suppression avoidance
- Visualization service
- Promotion of local production and consumption
- Certificate of renewable energy use

Clients

- Power retailers/providers, transmission system operators/market, renewable energy providers

Regional power provider

Municipalities, Customers

Prediction of storage equipment volume in the U.S.

- Source: National Renewable Energy Laboratory
- 2010s, 2020s, 2030s, 2040s
- 200, 100, 10
- 8 hours, 6 hours, 4 hours, 2 hours
Improving Enterprise Value

- **Enhance capital profitability** via corporate management that is conscious of the formula, Equity spread = ROE – Cost of shareholders’ equity.
- **Ensure growth potential** through advancing business portfolio management, and investment in intellectual capital (R&D, etc.) and human capital for growth.
- **Upgrade non-financial value** primarily via an effort to reduce environmental footprint and respect human rights.

Relations between Enterprise Value and Management Indicators

<table>
<thead>
<tr>
<th>Management Policy</th>
<th>Financial Value</th>
<th>Non-Financial value</th>
<th>ESG Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE 10% or higher</td>
<td>Shareholders’ equity (on book value basis)</td>
<td>PBR 0.84 PER 9.87</td>
<td>Market value as of Mar 31, 2023</td>
</tr>
<tr>
<td>Capital Policy</td>
<td>NGK ROIC</td>
<td>10% or higher</td>
<td>Reduction of Environmental Burden</td>
</tr>
<tr>
<td>(Financial Leverage)</td>
<td>Improve Asset Turnover Ratio</td>
<td>CAGR 5% or higher</td>
<td></td>
</tr>
<tr>
<td>Return to Stockholders</td>
<td>Leverage interest-bearing debt</td>
<td>ROIC hurdle rate 10%</td>
<td></td>
</tr>
<tr>
<td>Leverage interest-bearing debt</td>
<td>Improve Profitability</td>
<td>Capital turnover rate 0.67 or higher (FY2025 Performance Targets)</td>
<td></td>
</tr>
<tr>
<td>Improve Asset Turnover Ratio</td>
<td>Commercialization</td>
<td>Operating margin 15% or higher</td>
<td></td>
</tr>
<tr>
<td>Improve Profitability</td>
<td>Research &amp; Development</td>
<td>New Value 1000</td>
<td></td>
</tr>
<tr>
<td>Commercialization</td>
<td>The Reduction of Environmental Burden</td>
<td>New products Sales 100 billion yen or higher (DS50%,CN30%)</td>
<td></td>
</tr>
<tr>
<td>Research &amp; Development</td>
<td></td>
<td>R&amp;D Expenses Inject 300 billion yen over 10 years (80% or more to be invested in CN &amp; DS)</td>
<td></td>
</tr>
<tr>
<td>The Reduction of Environmental Burden</td>
<td></td>
<td>CO₂ Emissions a reduction of 50% compared with 2013</td>
<td></td>
</tr>
</tbody>
</table>

Aim to increase enterprise value by enhancing capital profitability, growth potential and non-financial value.

### Estimation of the NGK’s Capital Cost

<table>
<thead>
<tr>
<th>After-tax</th>
<th>Debt Cost</th>
<th>Capital Cost</th>
<th>D/E Ratio</th>
<th>Pre-tax WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0%</td>
<td></td>
<td>9.1% (CAPM)</td>
<td>0.4</td>
<td>10.0% (Hurdle rate)</td>
</tr>
</tbody>
</table>

### Performance target for 2030

- Dividend Payout Ratio 30% DOE 3% (3-year average) + Acquire treasury shares flexibly
- Maintain Financial soundness D/E Ratio 0.4
- ROIC hurdle rate 10%
- Capital turnover rate 0.67 or higher (FY2025 Performance Targets)
- Operating margin 15% or higher
- New Value 1000 New products Sales 100 billion yen or higher (DS50%,CN30%)
- R&D Expenses Inject 300 billion yen over 10 years (80% or more to be invested in CN & DS)
- CO₂ Emissions a reduction of 50% compared with 2013
**Business portfolio policy**

- Portfolio management pivoting on profitability and growth
- Scrutinize each product by using NGK-version of ROIC of 10% and a sales growth rate of 5% as the criteria.
- Inject management resources into investment domains and domains where we expect growth.
- Consider deciding whether or not to continue the business of each product that belongs to low-growth and low-profit domains.

The Environment Business will shift to a highly profitable and efficient business structure as growth slows down. Have overall sales and income grow by developing the Digital Society Business, which we expect to expand, and trying to change the business portfolio.
The Vision
Announced in the Vision in April 2021

- Sales: 600.0 bil yen
- Operating Income: 90.0 bil yen
- Net Income: 60.0 bil yen
- Capital Policy: ROE 10%, Dividend Payout Ratio 30%
- EPS: 200 yen

(After currency conversion: Ex Rate: USD 100 yen, EUR 120 yen)

Aim to achieve the performance goals for FY2025, indicated in the vision, by expanding sales and income, centered on the DS Business, in addition to making the EN Business highly profitable.

After currency conversion FY21 FY22 FY23 FY24 FY25
Sales
Energy & Industry (E&I)
Digital Society (DS)

Op. Income (Right axis)

Products lineups expected to expand our business

Digital Society
Components for semiconductor manufacturing equipment

Bonded wafers for SAW filters
Ceramic packages Etc.

Aim to achieve the performance goals for FY2025, indicated in the vision, by expanding sales and income, centered on the DS Business, in addition to making the EN Business highly profitable.
Aiming for creation of new products & businesses

**Commercialization**
- Push forward with the early commercialization of development themes by drastically strengthening the ability to gather information and the ability to cultivate markets. Do this through the Corporate NV Creation, which was established anew with 100-strong members in FY2021. Step up creation and development of new products through alliance.

**R&D**
- **Inject 300 billion yen over 10 years** from FY2021 (80% or more to be invested in CN and DS).
- **Construct a new R&D building**
  Develop DS-related new products, including new wafers for wireless communications equipment, optical devices, vehicle-mounted sensors for autonomous driving, etc.; micro heaters for semiconductor installation equipment, etc.
- **Build a materials informatics (MI) method that leverages our unique data**
  Confirmed the effect of shortening the product development period by building a basic system in FY2022. Aim to apply the method to material development for all products and shorten the development lead time to one-tenth in FY2030.

---

**Icing for an operating margin of more than 10%**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales FY2030 (Bln yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY21</td>
<td>60</td>
</tr>
<tr>
<td>FY25</td>
<td></td>
</tr>
<tr>
<td>FY30</td>
<td>30</td>
</tr>
</tbody>
</table>

**Outline of the new R&D building**
- **Location**: Nagoya City, Japan (Head Office Site)
- **Building area**: Approx. 1,800 m²
- **Total floor area**: Approx. 7,200 m²
- **Purpose**: Development of new DS-related products
- **CAPEX**: Approx. 10.0 Bln yen
- **Start of operations**: June 2025
Plan record-high R&D budgets mainly for CN- and DS-related products in order to achieve NV1000.

To enhance our own technologies, the Corporate NV Creation, the Corporate R&D and the Corporate Manufacturing Engineering coordinate and proceed with the development of new products in each theme steadily. Simultaneously, actively acquire technologies and resources from outside.
Capital Expenditures & Depreciation Costs

Invest funds for expanding sales and income of existing businesses, mainly in DS, and creating new businesses.

- Capital expenditures in some projects for FY2023 were delayed to FY2024 due to the effect of longer delivery times of components. After FY2024, we will continue making an investment of 60 billion yen or so mainly for production increases in the Digital Society Business.
- Also step up environmental investment to reach net zero CO₂ emissions. Establish internal carbon pricing (ICP) and judge the economic rationale of investments while factoring in the cost of CO₂ emissions.

- Process Technology: 7.5
- Electronics: 6.9
- Ceramics: 23.6
- Energy Infrastructure: 1.5
- Corporate: 6.1
- Capital Expenditures in October: 49.3
- Depreciation Costs in October: 53.0
- FY20: 50.8
- FY21: 49.3
- FY22: 53.7
- FY23FCT: 66.0
- FY24FCT: 57.0
- FY25FCT: 57.0

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Capital Policy

- Ensure profitability exceeding capital costs and financial soundness at the same time.
  Focus on capital efficiency with ROE as a management indicator and utilization of interest-bearing debt.
- Proactive shareholder returns from a medium- to long-term perspective
  Pay dividends while targeting a three-year average payout ratio of 30% and a three-year average DOE of 3%, and acquire and cancel treasury shares in a flexible manner.
- Keep the income rate, assets turnover and financial leverage at healthy levels consistent with business strategy

Adopted ROIC, which is highly related to ROE, as an internal management indicator (NGK-version of ROIC*)

Setting fund procurement through obtaining interest-bearing debt as the basis, aim for a debt-to-equity ratio of 0.4 to maintain financial soundness

*NGK-version of ROIC = Op. Income ÷ Business assets (sales receivables + inventories + fixed assets)

NGK ROIC  ROE
13.3%  12.9%
10.1%  9.0%
8.3%  6.0%

Below 10% due to deteriorating market conditions.

Aim to expand the equity spread by changing the business portfolio and expanding new businesses.

Return to Shareholders
3-year average DOE3% (dividend payout ratio30%)
Acquire and cancel Treasury shares flexibly

Leverage debt
Secure funds by leveraging interest-bearing debt
Maintain financial soundness D/E Ratio 0.4

Estimation of the NGK’s Capital Cost

<table>
<thead>
<tr>
<th></th>
<th>After-tax Debt Cost</th>
<th>Capital Cost</th>
<th>D/E Ratio</th>
<th>WACC</th>
<th>Pre-tax WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt Cost</td>
<td>1.0%</td>
<td>9.1% (CAPM)</td>
<td>0.4</td>
<td>6.9%</td>
<td></td>
</tr>
<tr>
<td>Capital Cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.0% (Hurdle rate)</td>
</tr>
</tbody>
</table>

Equity
Non-business Assets
Business Assets
Interest-bearing liabilities
D/E Ratio 0.4
Invested Capital
Equity
Treasury shares Purchase/cancellation
5 million shares (9.7 billion yen)

D/E Ratio 0.4
3-year average
Treasury shares Purchase/cancellation
5.5 million shares (9.6 billion yen)

Aim to expand the equity spread by changing the business portfolio and expanding new businesses.

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## Total Assets & Dividend

### (Bln. Yen)

<table>
<thead>
<tr>
<th>Year</th>
<th>Other Liabilities</th>
<th>Interest-bearing Liabilities</th>
<th>Net Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY19</td>
<td>234.4</td>
<td>469.1</td>
<td>833.1</td>
</tr>
<tr>
<td>FY20</td>
<td>264.2</td>
<td>517.9</td>
<td>909.0</td>
</tr>
<tr>
<td>FY21</td>
<td>589.6</td>
<td>982.8</td>
<td>1,029.2</td>
</tr>
<tr>
<td>FY22</td>
<td>642.4</td>
<td>1,029.2</td>
<td>1,030.0</td>
</tr>
<tr>
<td>FY23 FCT</td>
<td>253.4</td>
<td>240.0</td>
<td>226.56</td>
</tr>
</tbody>
</table>

### (Yen)

- **EPS**
- **Dividend**
- **Dividend Payout Ratio (Single year)**
- **Dividend Payout Ratio (Three year average)**

<table>
<thead>
<tr>
<th>Year</th>
<th>EPS</th>
<th>Dividend</th>
<th>Dividend Payout Ratio (Single year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY19</td>
<td>833.1</td>
<td>50</td>
<td>59.0%</td>
</tr>
<tr>
<td>FY20</td>
<td>909.0</td>
<td>30</td>
<td>41.0%</td>
</tr>
<tr>
<td>FY21</td>
<td>982.8</td>
<td>63</td>
<td>33.0%</td>
</tr>
<tr>
<td>FY22</td>
<td>1,029.2</td>
<td>66</td>
<td>37.2%</td>
</tr>
<tr>
<td>FY23</td>
<td>1,030.0</td>
<td>50</td>
<td>39.8%</td>
</tr>
</tbody>
</table>

### Other Key Financial Ratios

- **ROE**
  - FY19: 5.8%
  - FY20: 7.9%
  - FY21: 12.9%
  - FY22: 9.0%
  - FY23 FCT: 6.0%

- **D/E Ratio**
  - FY19: 0.51
  - FY20: 0.52
  - FY21: 0.43
  - FY22: 0.40
  - FY23 FCT: 0.38

- **Equity ratio of 50% or higher will be maintained.**

### Debt-to-Equity (D/E) Ratio

<table>
<thead>
<tr>
<th>Year</th>
<th>Single year</th>
<th>Three-year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY19</td>
<td>3.4%</td>
<td>3.4%</td>
</tr>
<tr>
<td>FY20</td>
<td>2.0%</td>
<td>2.9%</td>
</tr>
<tr>
<td>FY21</td>
<td>3.6%</td>
<td>3.0%</td>
</tr>
<tr>
<td>FY22</td>
<td>3.4%</td>
<td>3.0%</td>
</tr>
<tr>
<td>FY23</td>
<td>2.4%</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

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## Summary of Cash Flow

<table>
<thead>
<tr>
<th></th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Activities</strong></td>
<td>85.6</td>
<td>94.8</td>
<td>97.9</td>
<td>76.0</td>
</tr>
<tr>
<td><strong>Investing Activities</strong></td>
<td>(51.7)</td>
<td>(46.3)</td>
<td>(52.0)</td>
<td>(66.0)</td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(53.3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financing Activities</strong></td>
<td>12.3</td>
<td>(45.3)</td>
<td>(34.6)</td>
<td></td>
</tr>
<tr>
<td>New loans +32.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repayment (9.4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treasury stock Purchase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9.7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effect of Exchange Rate Changes on Cash &amp; Cash Equivalents</strong></td>
<td>5.2</td>
<td>5.5</td>
<td>2.6</td>
<td>(1.5)</td>
</tr>
<tr>
<td><strong>Net Increase (Decrease) in Cash &amp; Cash Equivalents</strong></td>
<td>51.3</td>
<td>8.8</td>
<td>14.0</td>
<td>(18.5)</td>
</tr>
<tr>
<td><strong>Cash &amp; Cash Equivalents at End of Period</strong></td>
<td>146.0</td>
<td>154.9</td>
<td>168.9</td>
<td>150.4</td>
</tr>
</tbody>
</table>

Free cash flow is expected to remain positive despite aggressive investment in digital society (DS), which is a growth domain.

Invest funds in growth domains based on a debt-to-equity ratio of 0.4.
Increase Non-Financial Value by Promoting ESG Management

Promote initiatives for “the environment,” “society,” and “governance,” which are the bases of business activities, to solve social issues through products and services.

### Environment

carry out various measures to achieve net zero CO₂ emissions by 2050.
- Plan to install solar energy plants totaling 40 megawatts at domestic and overseas manufacturing sites (Press release of November 24, 2022)
- Install a firing furnace for demonstration purposes to commercialize hydrogen combustion firing furnaces (Press release of March 28, 2023)

### Social

Respect for human rights affected by business activities and enhancement of human resource investment.
- NGK has formulated “NGK Group Human Rights Policy” in accordance with “the United Nations Guiding Principles on Business and Human Rights,” and disclosed a statement regarding the UK Modern Slavery Act.
- Promote CSR procurement based on “CSR Procurement Guidelines” concerning selecting companies and procuring raw materials, etc. Conducted detailed assessments of risks and CSR of business partners and support in improvement.
- In the field of women’s active participation, NGK obtained “Platinum Kurumin” certification in recognition of its efforts to support employees’ career paths and to make an employee-friendly environment including promotion of parental leave taken by male employees. (Press release of April 13, 2023)

### Governance

Establish an organizational structure that ensures the legality of business activities and the transparency of corporate management and is capable of swiftly addressing change in the management environment.
- With regard to risk management, NGK has established the “Risk Management Committee”, which is a supervising committee directly reporting to the President. This is an integrated risk management mechanism that is connected with the Board of Directors from a cross-departmental and company-wide perspective regarding individual risk matters handled by each committee.

---

**NGK Value-added**

\[
\text{Operating Income} - \text{CO}_2 \text{ Emission Cost} \times \text{ESG Target Achievement Rate}
\]

\[\text{Short-term Profitability} \times \text{Mid to Long-term Growth Potential} \times \text{ESG Target Achievement Rate} \]

- **CO₂ Emission Cost**: Calculated based on ICP ($140/t CO₂)

---

**ESG Target Achievement Rate**

<table>
<thead>
<tr>
<th>Rating Agencies</th>
<th>Targets</th>
<th>Achievement Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>DJSI</td>
<td>Inclusion to the world</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>84%</strong></td>
</tr>
<tr>
<td>MSCI</td>
<td>AA Rating</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>98%</strong></td>
</tr>
<tr>
<td>FTSE</td>
<td>Inclusion to Japan Index</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Average achievement rate of three agencies: 89% to 94%

---

**Aim for an annual improvement of 5% to 10%**

---

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<table>
<thead>
<tr>
<th>Product Category</th>
<th>FY2020</th>
<th>FY2021</th>
<th>FY2022</th>
<th>FY2023 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Honeycomb filters</strong></td>
<td>63.7</td>
<td>70.4</td>
<td>81.3</td>
<td>79.0</td>
</tr>
<tr>
<td><strong>GPF</strong></td>
<td>33.2</td>
<td>33.9</td>
<td>36.8</td>
<td>43.0</td>
</tr>
<tr>
<td><strong>Cd-DPF•LSH</strong></td>
<td>59.2</td>
<td>78.3</td>
<td>84.3</td>
<td>81.0</td>
</tr>
<tr>
<td><strong>SiC-DPF</strong></td>
<td>39.6</td>
<td>46.3</td>
<td>59.7</td>
<td>61.0</td>
</tr>
<tr>
<td><strong>Sensors</strong></td>
<td>53.3</td>
<td>63.7</td>
<td>58.7</td>
<td>71.0</td>
</tr>
<tr>
<td><strong>Environment Business</strong></td>
<td>248.9</td>
<td>292.7</td>
<td>320.8</td>
<td>335.0</td>
</tr>
<tr>
<td><strong>SPE related</strong></td>
<td>80.1</td>
<td>96.9</td>
<td>107.0</td>
<td>92.0</td>
</tr>
<tr>
<td><strong>Electronics components</strong></td>
<td>27.9</td>
<td>29.5</td>
<td>28.6</td>
<td>28.0</td>
</tr>
<tr>
<td><strong>Metal related</strong></td>
<td>19.3</td>
<td>23.9</td>
<td>27.6</td>
<td>27.0</td>
</tr>
<tr>
<td><strong>Soshin Electric CO.</strong></td>
<td>6.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Digital Society Business</strong></td>
<td>134.2</td>
<td>150.3</td>
<td>163.2</td>
<td>147.0</td>
</tr>
<tr>
<td><strong>Energy Storage</strong></td>
<td>2.8</td>
<td>1.3</td>
<td>2.7</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Insulators</strong></td>
<td>39.1</td>
<td>39.3</td>
<td>44.2</td>
<td>44.5</td>
</tr>
<tr>
<td><strong>Industrial Processes</strong></td>
<td>27.0</td>
<td>26.9</td>
<td>28.3</td>
<td>33.5</td>
</tr>
<tr>
<td><strong>Energy &amp; Industry</strong></td>
<td>69.0</td>
<td>67.5</td>
<td>75.3</td>
<td>83.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>452.0</td>
<td>510.4</td>
<td>559.2</td>
<td>565.0</td>
</tr>
</tbody>
</table>

*1 The Ceramics Business has been renamed to the Environment Business since the beginning of FY2022.

*2 The Electronics Business has been dissolved and reorganized into the Digital Society Business composed of SPE related, Electronics components, and Metal-related since the beginning of FY2022.

*3 Excluded from consolidation in the fourth quarter of FY2020.

*4 The Energy Infrastructure Business has been dissolved and reorganized into the Energy & Industry Business composed of Energy Storage, Insulators and Industrial Processes.
<table>
<thead>
<tr>
<th>(After inter-segment elimination)</th>
<th>FY2022</th>
<th>FY2023 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1H</td>
<td>2H</td>
</tr>
<tr>
<td><strong>Honeycomb filters</strong></td>
<td>40.0</td>
<td>41.4</td>
</tr>
<tr>
<td><strong>GPF</strong></td>
<td>18.4</td>
<td>18.4</td>
</tr>
<tr>
<td><strong>Cd-DPF・LSH</strong></td>
<td>39.8</td>
<td>44.5</td>
</tr>
<tr>
<td><strong>SiC-DPF</strong></td>
<td>27.2</td>
<td>32.5</td>
</tr>
<tr>
<td><strong>Sensors</strong></td>
<td>27.8</td>
<td>31.0</td>
</tr>
<tr>
<td><strong>Environment Business</strong></td>
<td><strong>153.1</strong></td>
<td><strong>167.7</strong></td>
</tr>
<tr>
<td><strong>SPE related</strong></td>
<td>59.0</td>
<td>47.9</td>
</tr>
<tr>
<td><strong>Electronics components</strong></td>
<td>16.4</td>
<td>12.2</td>
</tr>
<tr>
<td><strong>Metal related</strong></td>
<td>12.7</td>
<td>14.9</td>
</tr>
<tr>
<td><strong>Digital Society Business</strong></td>
<td><strong>88.2</strong></td>
<td><strong>75.0</strong></td>
</tr>
<tr>
<td><strong>Energy Storage</strong></td>
<td>1.1</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Insulators</strong></td>
<td>20.0</td>
<td>24.2</td>
</tr>
<tr>
<td><strong>Industrial Processes</strong></td>
<td>12.3</td>
<td>16.0</td>
</tr>
<tr>
<td><strong>Energy &amp; Industry Business</strong></td>
<td><strong>33.4</strong></td>
<td><strong>41.9</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>274.7</strong></td>
<td><strong>284.6</strong></td>
</tr>
</tbody>
</table>
Consolidated Operating Results

Operating Income
Ordinary Income
Net Income Attributable to Owners of the Parent
Net Sales

FX Rate
USD
EUR

ROE
13.3%
8.8%
10.4%
7.6%
5.8%
7.9%
12.9%
9.0%
6.0%

EPS
¥163.28
¥112.71
¥142.42
¥110.35
¥84.73
¥121.61
¥226.56
¥177.47
¥125.67

Dividend
¥38
¥40
¥44
¥50
¥50
¥30
¥63
¥66
¥50

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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.