FY2023 1st Half Results (from April 1, 2023 to September 30, 2023)
October 30, 2023

This is a translation of materials used for the analyst meeting held online, Japan on October 30, 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 FY2023
(1st Half results/Forecasts for FY2023)

Forecasts for Each Business Segment

Improving Enterprise Value
Capital Profitability and Growth Potential of Existing Business
Aiming for creation of new products & businesses

R&D/ Capital Expenditures & Depreciation Costs

Promoting ESG Management

Capital Policy (Treasury Shares Purchase /Sustainable Finance)

Total Assets・Dividend／Summary of Cash Flow
### Summary of Financial 1st Half Results for FY2023

<table>
<thead>
<tr>
<th></th>
<th>FY2022 1st half</th>
<th>Announcement April</th>
<th>FY2023 1st half</th>
<th>YOY Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Bln. Yen)</td>
<td></td>
<td></td>
<td>FX Impact</td>
</tr>
<tr>
<td>Net sales</td>
<td>274.7</td>
<td>265.0</td>
<td>282.9</td>
<td>+9.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+3%</td>
</tr>
<tr>
<td>Operating Income</td>
<td>38.8</td>
<td>25.0</td>
<td>32.5</td>
<td>+2.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-16%</td>
</tr>
<tr>
<td>Ordinary Income</td>
<td>34.5</td>
<td>23.0</td>
<td>28.9</td>
<td>-16%</td>
</tr>
<tr>
<td>Net income Attributable to Owners of the Parent</td>
<td>26.5</td>
<td>16.0</td>
<td>18.2</td>
<td>-31%</td>
</tr>
</tbody>
</table>

| Exchange Rate | USD | 133yen (130yen) | 141yen | +8yen |
|              | EUR | 139yen (140yen) | 154yen | +15yen |

**Sales Increased; Operating Income Decreased Year on Year.**
**Sales and Income Decreased compared to the April Announcement.**

- **Environment**
  - Both sales and income increased due to a rise in demand resulting from higher sales quantities of trucks in China and the strengthening of emissions regulations in addition to a recovery in automotive production against the background of an easing of component shortages including semiconductors.

- **Digital Society**
  - Both sales and income decreased as demand for semiconductor manufacturing equipment products and electronic components decreased due to the stagnation of investment in semiconductors and data centers.

- **Energy & Industry**
  - There was an increasing in sales, and profitability was improved, reflecting insulator’s price revisions and stable demand in its market in the U.S.
## Forecasts for FY2023

<table>
<thead>
<tr>
<th></th>
<th>FY2022 (Bln. Yen)</th>
<th>FY2023 Announcement April</th>
<th>YOY Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net sales</strong></td>
<td>559.2</td>
<td>565.0</td>
<td>+13.8  +3%</td>
</tr>
<tr>
<td><strong>Operating Income</strong></td>
<td>66.8</td>
<td>56.0</td>
<td>+3.9  -7%</td>
</tr>
<tr>
<td><strong>Ordinary Income</strong></td>
<td>65.9</td>
<td>53.0</td>
<td>-12%</td>
</tr>
<tr>
<td><strong>Net Income Attributable to Owners of the Parent</strong></td>
<td>55.0</td>
<td>38.5</td>
<td>-29%</td>
</tr>
</tbody>
</table>

### Exchange Rate

- **USD**: 135yen (130yen), Assumed exchange rate in 2nd half: 141yen
- **EUR**: 141yen (140yen), Assumed exchange rate in 2nd half: 152yen

Sales Increased; Operating Income Decreased Year on Year.
Sales and Income Decreased compared to the April Announcement.

- **Environment**: Both sales and income are expected to increase due to a recovery in automotive production associated with the easing of component shortages, which continued from the first half of the fiscal year, higher sales volumes of trucks in China and the positive effect of the weak yen.

- **Digital Society**: Both sales and income are expected to decrease due to a decline in demand as the stagnation of investment in semiconductors and data centers will continue and a market recovery will be delayed further than assumed at the beginning of the fiscal year.

- **Energy & Industry**: Sales are expected to increase and losses to fall, with business breaking even due to insulator’s price revisions and demand in the U.S. being steady, and demand for Industrial heating systems for Lithium-ion battery cathode materials increasing.
Sales Change Analysis for FY2023

(Bln. Yen)

<table>
<thead>
<tr>
<th>Category</th>
<th>FY2022 Result</th>
<th>April FY2023 Forecast</th>
<th>New FY2023 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD/JPY Forex</td>
<td>(6.9)</td>
<td>+17.8</td>
<td>141 yen</td>
</tr>
<tr>
<td>EUR/JPY Forex</td>
<td>+130 yen</td>
<td>140 yen</td>
<td></td>
</tr>
<tr>
<td>Digital Society</td>
<td>(13.2)</td>
<td>+8.0</td>
<td></td>
</tr>
<tr>
<td>Energy &amp; Industry</td>
<td>+2.1</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>+20.3</td>
<td>+0.1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>559.2</td>
<td><strong>565.0</strong></td>
<td><strong>575.0</strong></td>
</tr>
</tbody>
</table>
Operating income Change Analysis for FY2023

**Breakdown**
- Rising raw material and energy cost: (17.0)
- R&D and depreciation: (8.1)
- Shipment: +6.3
- Sales price revision: +4.0
- Others: +4.8

**USD/JPY and EUR/JPY Forex**
- Environment: +0.2
- Digital Society: (11.7)

**USD/JPY Forex**
- Energy & Industry: +1.5

**Environment**
- New FY2023 Forecast: 141 yen

**Digital Society**
- New FY2023 Forecast: 152 yen

**FY2022 Result**
- USD 135 yen
- EUR 141 yen

**April FY2023 Forecast**
- 130 yen
Forecasts for the Environment Business

- Automotive Related
  Both sales and income are expected to increase compared to the April forecast as demand increases due to the increase in truck and off-road vehicle sales in China, and with the added positive effect of the weak yen. Demand for products for passenger vehicles will increase compared with the previous year due to the global increase in passenger vehicle sales and the strengthening of China’s emissions regulations. In addition, demand for products for trucks and off-road vehicles is expected to increase due to the strengthening of China’s off-road emissions regulations and in increase in the number of trucks sold in China.
  
  - Honeycomb filters/GPF (for gasoline fueled vehicles)
    : As expected at the beginning of the term, demand has remained strong generally, and sales increased compared to the April forecast due to the effect of the weak yen.
  
  - SiC-DPF (for diesel passenger vehicles/trucks)
    : Sales increased from the April forecast as demand increased more than initially expected in China due to the strengthening of off-road emissions regulations.
  
  - Sensors (for diesel passenger vehicles/trucks)
    : Sales decreased slightly from the April forecast due to a slight decrease in volume in association with customer inventory adjustments.
  
  - Cd-DPF/LSH (for trucks)
    : Product demand increased from the April forecast due to an increase in truck sales in China. Sales also increased due to the effect of the weak yen.

(Bln. Yen)

- Sales
  <After inter-segment elimination>

- Operating Income
  
  Operating Income Margin

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The future perspective for the EN Business

We will promote our high-value-added products not only for passenger cars, but also for trucks and off-road vehicles.

Forecast for Automobile Sales (NGK’s Est.)

- Ratio of vehicles with non-combustion engines (EV/FCV)
  - Japan: 36%
  - Europe: 10%

Forecast for emission regulations (NGK’s Est.)

<table>
<thead>
<tr>
<th>Markets</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>...</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>PPNLT(WLTC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GE/GDI·MPI RDE</td>
</tr>
<tr>
<td>Europe</td>
<td>EU6d-Full</td>
<td>EU7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S.</td>
<td>Tier3 LEV III</td>
<td>PM1mg</td>
<td></td>
<td>China’s stage 6a (AⅡ)</td>
<td>China’s stage 6b (AⅡ)</td>
<td>China’s stage 7 (AⅢ)</td>
</tr>
<tr>
<td>China</td>
<td>China’s stage 6a (AⅡ)</td>
<td>BS6</td>
<td>BS6</td>
<td>BS7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>BS6 Stage I</td>
<td>BS6 Stage II</td>
<td>BS6</td>
<td>BS7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>EU4</td>
<td>EU5</td>
<td>EU6b</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The impact of the new emission regulation in Europe, Euro7

Launching GPF with Surface Adsorption Layer (High value-added products)

In the European market, the new Euro 7 emissions regulations, which are scheduled to be introduced in 2025, will tighten regulations on the number of particulate material (PM) emissions.

We have already developed and implemented a highly functional GPF product with a highly effective surface collection layer. We will promote our high-value-added products not only for passenger cars, but also for trucks and off-road vehicles.

Business Scale of NOx Sensor for Gasoline

Under the new Euro 7 emissions regulations, Continuous NOx Monitoring will be obligatory concerning gasoline engine. Demand for the NOx sensors for gasoline developed by the company is expected to materialize, and the scale of the business is expected to be larger than initially forecast.

We will capture demand with certainty while optimizing our production system.
Forecasts for the Digital Society Business

- **SPE Related (Components for semiconductor production equipment)**
  - Demand for semiconductors has remained sluggish with the continued slump in smartphone and PC sales since last year. Although there are positive impacts from sales price revisions and the effect of the weak yen, long-term stagnation and a delay in the timing of recovery are clear with regard to demand for semiconductor manufacturing equipment, and sales and income are expected to decrease in comparison to the April forecast with demand also decreasing.
  - Although the sector will get back into form gradually from the end of the fiscal year, full-scale recovery is expected from next term on.

- **Electronic Components**
  - Demand for piezoelectric element products for HDDs has decreased as data center investment has been curbed temporarily due to concentrated investment in AI infrastructure. Although it is anticipated that data center investment will resume gradually in the new year and demand will increase over the medium to long term, sales are expected to decrease in comparison to the April forecast.
  - Sales of ceramic packaging for crystals are expected to decrease in comparison to the April forecast due to a delay in the recovery of smartphone sales in China.

- **Metal Related**
  - Although product demand is on a recovery trend, sales are expected to decrease in comparison to the April forecast due to supply chain inventory adjustments.

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**Sales**

(Bln. Yen)

<table>
<thead>
<tr>
<th></th>
<th>FY2021</th>
<th>FY2022</th>
<th>April FCT</th>
<th>New FCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPE Related</td>
<td>150.3</td>
<td>163.2</td>
<td>147.0</td>
<td>140.0</td>
</tr>
<tr>
<td>Electronic Components</td>
<td>23.9</td>
<td>27.6</td>
<td>27.0</td>
<td>26.0</td>
</tr>
<tr>
<td>Metal Related</td>
<td>96.9</td>
<td>107.0</td>
<td>92.0</td>
<td>88.0</td>
</tr>
</tbody>
</table>

**Operating Income**

- FY2021: 19.9%
- FY2022: 17.6%
- April FY2023: 5.0%
- New FCT: 2.0%
The future perspective for the DS Business

**Components for semiconductor manufacturing equipment (SPE)**

- (Bln. Dollar) [NGK’s forecast for the demand of SPE related]

**Electronic Components** (Piezoceramic Actuators for HDD)

- (Expected sales volume of HDD installed in near-line servers)

Due to the sluggishness of demand for semiconductors, WFE investment in fiscal year 2023 is expected to be lower than the March forecast. Although it is expected to recover from fiscal year 2024, the record high level of fiscal year 2022 will only be exceeded from fiscal year 2025 on. We will continue to invest for increased production to ensure that we capture demand for the company’s products when the market expands again due to the progress in society of digitalization.

Major US hyperscalers are currently holding back on data center investment, but demand for HDDs for nearline servers is expected to increase over the medium to long term as they resume data center investment aimed at the full-scale social implementation of AI learning data and the metaverse.

**Special metals and molds** (Beryllium copper products)

The demand for beryllium copper is expanding not only for EV-related connector components but also for inspection purposes in semiconductors.
Insulators
- Both sales and income are expected to increase in comparison to the April forecast due to steady demand underpinned by plans for expanding and reinforcing transmission networks in the United States in addition to revisions of sales prices.

Energy Storage
- Sales are expected to decrease in comparison to the April forecast due mainly to the delay in shipments on domestic projects and ongoing losses are expected. We will improve our products, strengthen our production system and promote cost reductions towards the expansion of sales to overseas markets based on the BASF sales alliance.

Industrial Processes
- While demand for industrial heating systems for lithium-ion batteries is expected to remain firm demand, on the other hand, demand for advanced refractory materials for MLCCs is expected to decrease, leading to reduced sales and income in comparison to the April forecast.
The future perspective for the E&I Business

**NAS® batteries (Energy storage)**

Overseas, where the introduction of renewable energy is ahead of Japan, potential demand for NAS batteries (large capacity, long duration) is expected to materialize and become fully-fledged from 2025.

The development of new demand for NAS batteries in combination with renewable energy, such as for green hydrogen, off-grid, and improvement of the rate of use of renewable energy, has materialized due to the sales alliance with BASF. We will use BASF’s worldwide network to expand sales in the market and reduce material costs.

**Industrial Processes (Membrane)**

We will provide very safe water through a combination of membrane separation technologies optimal for water used in pharmaceutical manufacturing processes.

In the new drug field, in addition to biopharmaceuticals, the size of the market has expanded due to the expansion of COVID-19 vaccine investment. We will make sure to capture large projects and increase revenues.

**Insulators**

- **Japan Market**
  - In March, we announced that it would end the manufacture and sale of NGK products manufactured at Chita Site within a few years. We are currently in discussions with customers about this.
  - We will improve profitability by reducing fixed costs, revising sales prices, etc.

- **U.S. Market**
  - Demand for polymer insulators has been steady due to plans to expand and strengthen transmission and distribution networks related to renewable energy.

We are promoting the improvement of profitability through rationalization, cost reductions, sales price revisions, etc., and profits are expected to continue in the future too.
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>Enterprise Value</th>
<th>Management Policy</th>
<th>Management Indicators (KPIs)</th>
<th>Performance target for 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shareholders’ equity (on book value basis)</td>
<td>ROE 10% or higher</td>
<td>Capital Policy (Financial Leverage)</td>
<td>Dividend Payout Ratio 30% DOE3% (3-year average) + Acquire treasury shares flexibly</td>
</tr>
<tr>
<td>Financial Value</td>
<td>Higher</td>
<td>Return to Stockholders</td>
<td>ROIC hurdle rate 10%</td>
</tr>
<tr>
<td>Non-Financial value</td>
<td>Lower</td>
<td>Leverage interest-bearing debt</td>
<td>Capital turnover rate 0.67 or higher (FY2025 Performance Targets)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve Asset Turnover Ratio</td>
<td>ROIC hurdle rate 10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve Profitability</td>
<td>Operating margin 15% or higher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commercialization</td>
<td>New Value 1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sales Growth</td>
<td>New products Sales 100 billion yen or higher (DS50%, CN30%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NGK Value-added</td>
<td>R&amp;D Expenses Inject 300 billion yen over 10 years (80% or more to be invested in CN &amp; DS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ESG Management</td>
<td>CO₂ Emissions a reduction of 50% compared with 2013</td>
</tr>
</tbody>
</table>

Estimation of the NGK’s Capital Cost

- After-tax Debt Cost 1.0%
- Capital Cost 9.0% (CAPM)
- D/E Ratio 0.4
- WACC 6.8%
- Pre-tax WACC 9.7% (Hurdle rate)

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

Market value as of Sep 30, 2023

- PBR 0.89
- PER 15.45

Market premium

- Shareholders’ equity
- Sales growth
- ROIC
- ROIC hurdle rate 10%
- ROE 10% or higher
- D/E Ratio 0.4
- NGK Value-added
- NGK
- New Value 1000
- R&D Expenses
- ESG Management
- CO₂ Emissions
- Performance target for 2030

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Capital Profitability and Growth Potential of Existing Business

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.

FY25 FCT compared to April assumption: The size of circle is sales

Consolidated performance trends

- Operating Income (Bln. Yen)
  - 50.8
  - 83.5
  - 66.8
  - 62.0

- Sales (Bln. Yen)
  - Energy & Industry
    - FY2020: 452.0
    - FY2021: 510.4
    - FY2022: 559.2
    - FY2023: 575.0

- Digital Society
  - FY2020: 54.1
  - FY2021: 53.4
  - FY2022: 163.2
  - FY2023: 140.0

- Environment
  - FY2020: 2,514
  - FY2021: 292.7
  - FY2022: 320.8
  - FY2023: 351.0

Instead of "capital" and "liabilities", this is calculated based on business assets (accounts receivable, inventories, fixed assets) that can be managed by business divisions.

The Environment Business will introduce high value-added products continuously to improve profitability while maintaining growth potential. The high growth expectations of Digital Society Business have not changed despite the delay in the recovery of market conditions, and the company will push ahead with business transformation through positive inputs.
Aiming for creation of new products & businesses

SN DCB Circuit Substrate

Ceramic circuit boards for vehicle and industrial equipment power modules, excellent in reliability and heat conduction. In addition to the electrification of automobiles (EV/HV), demand for industrial equipment applications such as renewable energy is expected to increase.

In association with improvements in power module performance, the performance required from insulated heat dissipation circuit boards has increased, such as the improvement of heat dissipation performance against increased output.

In particular, the company’s products are increasingly being used in automotive power modules due to their superior “cooling-heating cycle reliability.”

Estimated Market shares, sorted by Power Module Manufacturer (Number of automobiles with inverter)

<table>
<thead>
<tr>
<th>Year</th>
<th>Europe</th>
<th>Japan</th>
<th>North America</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>'22</td>
<td>25</td>
<td>30</td>
<td>40</td>
<td>93%</td>
</tr>
<tr>
<td>'25</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>90%</td>
</tr>
<tr>
<td>'30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>80%</td>
</tr>
<tr>
<td>'35</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>70%</td>
</tr>
</tbody>
</table>

Market Scale of SN DCB Circuit Substrate (NGK’s Est)

From a competitive environment perspective, the target markets for the company’s products are assumed to be PM manufacturers in Europe, Japan and North America. The adoption of SN insulated heat dissipation circuit boards will increase in association with the increase in power modules that use SiC semiconductors centered on BEV. We will establish a mass production system promptly and promote market launches.
**Aiming for creation of new products & businesses**

- **Honeycomb Structure Sorbent Material for Direct Air Capture**
  
  Direct air capture (DAC) is a technology that collects CO₂ directly from atmosphere with adsorbing and absorbing. The separation and use of CO₂, including methanation, will be required to realize a carbon-neutral society. Applying the ceramic honeycomb structure technology which the company has cultivated in ceramics for automotive exhaust gas purification, the features of this technology include that “it is compact and has a large surface area” and “it has low pressure loss (it can process large amounts of air efficiently).” 1 billions tons of CO₂ will be processed via DAC in 2050, our ceramics technology will contribute to reduce CO₂ emissions.

- **“Sub-nano ceramic membrane” capable of molecular-level**
  
  A sub-nano ceramic membrane is a separation membrane with particularly fine sub-nano class pores. The separation of gases and liquids at the molecular level is possible by arranging zeolites that have pores at the molecular level in the crystal structure on the cell surface. Applying a sub-nano ceramic membrane to current processes, CO₂ emissions are expected to decrease by half.

**Example of Development Products**

- DDR-type zeolite membrane for CO₂ separation
  
  CO₂ separation from EOR and natural gas

- Zeolite membrane for H₂ separation
  
  The separation of H₂ and methane in H₂ transportation using existing natural gas pipelines

- Dehydration Membrane
  
  Dehydration in chemical plant processes, etc

**Market Scale of Sub-nano ceramic membrane**

We will implement demonstration tests and aim for an early market launch using the manufacturing equipment for ceramic substrates for automotive catalytic converters.

We will strengthen the test and evaluation system and promote marketing activities towards the application of the system in major uses by 2030.
Plan record-high R&D budgets mainly for CN- and DS-related products in order to achieve NV1000*. Increase of one billion yen compared to the forecast in April due to an increase in development expenses for products close to commercialization, etc.

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.

*NewValue1000: the key measure to boost net sales of newly commercialized products to a minimum of 100 billion yen in 2030
With regard to capital investment in the fiscal year ending March 2024, we revised our investment plan after ascertaining the timing of market recovery in Digital Society Business. After FY2025, 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.
Promoting ESG Management

As a company that contributes to the future of energy, the protection of the global environment, and the development of industry based on unique ceramic technology, we have identified the materialities for us to realize our ideal form under the group philosophy of “Enriching human life by adding new value to society.”

Materiality (Important issues)

Based on our Basic Policy on Sustainability, the NGK Group identified its Materiality in April 2023. By efficiently and effectively utilizing our limited management resources to address these material issues, our Group seeks to maximize value creation for both the Group and our stakeholders.

- Environmental issues
- Social issues
- Initiatives for climate change
- Promotion of sustainable procurement
- Respecting human rights
- Pursuit of quality and product safety
- Promotion of resource recycling
- Conservation and restoration of biodiversity
- Prevention of environmental pollution
- Contribution to digital social infrastructure
- Enhancing value of human resource

Enhancing value of human resource

In June 2023, we formulated the “NGK Group Human Capital Management Policy,” the “Human Resources Development Policy,” and the “Internal Environment Development Policy” to enhance the human resources who will work on the realization of the NGK Group Vision and create an environment in which they can play active roles.

- Human Resource Development Policy
  - Cultivate advanced knowledges, skills, abilities and their combination, and proactively approach to problems
  - Demonstrate teamwork and persistently lead to results
  - Autonomously grow and continuously change oneself and the company

- Work Development Policy
  - Diverse and Inclusive Workplace
  - Enriched and Lively Workplace
  - Open Workplace that encourages challenges

- We implement an organizational activity level survey every year to measure the degree of activity of human resources and workplaces.

With a view to future business development and the expansion of our business areas, we are promoting the recruitment of human resources with specialized knowledge and skills in various fields, and creating an environment and culture within which those human resources can play an active role.

Initiatives for climate change

We achieved CO2 emissions of 560,000 tons (a reduction of 23% compared with 2013) in fiscal year 2022. We will continue to promote energy savings, the strengthening of renewable energy procurement and the installation of PV systems for further reductions. In addition, we will also promote the development of hydrogen and ammonia fuel conversion technologies.

We are advancing information disclosure based on the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), analyzed the risks and opportunities of climate change and the magnitude of their impacts after setting the time axis and scenarios, and disclosed the results in May 2023.

Promotion of sustainable procurement

We maintain and select suppliers based on the “CSR Procurement Guidelines” to identify risks related to sustainability in the supply chain.

Since fiscal year 2021, we have implemented fact-finding survey questionnaires to carry out detailed CSR evaluations of each supplier, and have expanded the scope to include major suppliers of domestic and overseas group companies.


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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 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.

### Estimation of the NGK's Capital Cost

<table>
<thead>
<tr>
<th></th>
<th>After-tax</th>
<th>Debt Cost</th>
<th>Capital Cost</th>
<th>D/E Ratio</th>
<th>WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0%</td>
<td></td>
<td>9.0%(CAPM)</td>
<td>0.4</td>
<td>6.8%</td>
</tr>
<tr>
<td>Pre-tax WACC</td>
<td>9.7%(Hurdle rate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

---

Below 10% due to deteriorating market conditions.

**NGK ROIC**

- 10.1% Hurdle rate 10% or higher (Pre-tax WACC 9.3%)
- 9.0% ROE
- 6.1%

**Return to Shareholders**

3-year average DOE3%
Acquire treasury shares flexibly

<table>
<thead>
<tr>
<th>FY22</th>
<th>FY23FCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury shares purchase</td>
<td>6.5 million shares (15 billion yen)</td>
</tr>
<tr>
<td>Treasury shares purchase (Plan)</td>
<td>6.5 million shares</td>
</tr>
<tr>
<td>Invested Capital</td>
<td>D/E Ratio 0.4</td>
</tr>
<tr>
<td>D/E Ratio 0.4</td>
<td></td>
</tr>
</tbody>
</table>

**Leverage debt**

- Secure funds by leveraging interest-bearing debt
- Maintain financial soundness

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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 treasury shares in a flexible method.

Capital Policy ~Treasury Shares Purchase~

➢ Acquisition of Treasury Shares
Up to 8.5 million shares/15 billion yen
Acquisition method: Market purchases
Acquisition period: From October 30, 2023 to February 29, 2024

✔ While investing positively in capital expenditure in line with the expansion of automotive and SPE / electronic components business, the company has also acquired a cumulative total of more than 120 million treasury shares, including the shares scheduled for acquisition in the current fiscal year, worth more than 160 billion yen.

✔ From now on, we will continue to provide shareholder returns while prioritizing inputs for the expansion of income from existing business and the creation of new business.
### Capital Policy ~Sustainable Finance (ESG Management)~

Financing investments in projects contributing to decarbonization and in development related to carbon neutrality by Green Bonds (interest-bearing liabilities)

#### Allocation of the first green bond, 10 billion yen (7 years) and the second green bond, 5 billion yen

The green bond has obtained “Green 1(F),” the highest rating, provided by an external reviewer (Japan Credit Rating Agency, Ltd.).

<table>
<thead>
<tr>
<th>Eligible project categories</th>
<th>Project cases</th>
<th>Seventh series of NGK INSULATORS, LTD. unsecured straight bonds (The first green bond)</th>
<th>Eighth series of NGK INSULATORS, LTD. unsecured straight bonds (The second green bond)</th>
<th>Total</th>
</tr>
</thead>
</table>
| Batteries                   | • NAS® Batteries  
• Zinc Rechargeable Batteries ® | Allocated amount (January to March 2022): 1.5  
Allocating amount (April to March 2023): 3.1  
Allocating amount (December to March 2023): 1.5  |  | 6.2 |
| Next-generation power semiconductors | • Gallium Nitride (GaN) Wafer  
• DCB Circuit Substrate | 0.8  
1.4  
1.3  |  | 3.6 |
| CCU/CCS and hydrogen/ammonia | • CO₂ Separation Membrane | 0.6  
1.6  
1.7  |  | 4.0 |
| Clean energy utilization    | • Install Photovoltaic Equipment Systems using NAS® Batteries | 0.2  
0.3  
0.2  |  | 0.7 |
| Energy-efficient manufacturing | • Invest in the high-efficiency facilities meeting Energy-efficient standard sufficiently | 0.1  
0.2  
0.2  |  | 0.4 |
|                            | Total(except issuance costs) | 3.3  
6.6  
4.9  | *14.9* |

* All funds have been applied except for issue expenses.

#### Third Series of Green Bonds in 2023 (Plan)

Ninth Series of NGK INSULATORS, LTD. Unsecured Straight Bonds

<table>
<thead>
<tr>
<th>Issuance amount</th>
<th>10 billion yen (Degree)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issuance date</td>
<td>November, 2023 onwards</td>
</tr>
<tr>
<td>Maturity</td>
<td>5 years</td>
</tr>
</tbody>
</table>

In addition to reinvesting retained earnings, we will secure financing through interest-bearing debt and provide growth inputs related to carbon neutrality while maintaining both financial soundness and capital efficiency.
Total Assets & Dividend

(Bln. Yen)

- Other liabilities
- Interest-bearing liabilities
- Net assets

<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>1,060.0</td>
<td>1,060.0</td>
</tr>
<tr>
<td>FY23 FCT</td>
<td>657.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 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</th>
<th>Dividend Payout Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY23 FCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- ROE: 5.8% to 6.1%
- D/E Ratio: 0.51 to 0.39

Equity ratio of 50% or higher will be maintained.
## Summary of Cash Flow

<table>
<thead>
<tr>
<th></th>
<th>FY21</th>
<th>FY22</th>
<th>FY23 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Bln. Yen)</td>
<td>(Bln. Yen)</td>
<td>April Announcement</td>
</tr>
<tr>
<td><strong>Operating Activities</strong></td>
<td>94.8</td>
<td>97.9</td>
<td>76.0</td>
</tr>
<tr>
<td><strong>Investing Activities</strong></td>
<td>(46.3)</td>
<td>(52.0)</td>
<td>(66.0)</td>
</tr>
<tr>
<td>Investment</td>
<td>(37.4)</td>
<td>(43.1)</td>
<td>(66.0)</td>
</tr>
<tr>
<td><strong>Financing Activities</strong></td>
<td>(45.3)</td>
<td>(34.6)</td>
<td>(27.0)</td>
</tr>
<tr>
<td>New loans</td>
<td>+15.0</td>
<td>+29.6</td>
<td>+25.0</td>
</tr>
<tr>
<td>Repayment</td>
<td>(34.0)</td>
<td>(32.8)</td>
<td>(34.1)</td>
</tr>
<tr>
<td>Treasury shares purchase</td>
<td>(9.7)</td>
<td>(9.6)</td>
<td>(9.6)</td>
</tr>
<tr>
<td><strong>Effect of Exchange Rate Changes on Cash &amp; Cash Equivalents</strong></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>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>154.9</td>
<td>168.9</td>
<td>150.4</td>
</tr>
</tbody>
</table>

**Notes:**
- Invest funds in growth domains based on a debt-to-equity ratio of 0.4
- D/E Ratio (Right axis)
- Net D/E Ratio (Right axis)
- Free cash flow is expected to remain positive despite aggressive investment in digital society (DS), which is a growth domain.
## Sales by Product (Annual)

<table>
<thead>
<tr>
<th></th>
<th>FY2020</th>
<th>FY2021</th>
<th>FY2022</th>
<th>FY2023 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;After inter-segment elimination&gt;</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Honeycomb filters</td>
<td>63.7</td>
<td>70.4</td>
<td>81.3</td>
<td>83.0</td>
</tr>
<tr>
<td>GPF</td>
<td>33.2</td>
<td>33.9</td>
<td>36.8</td>
<td>44.0</td>
</tr>
<tr>
<td>Cd-DPF・LSH</td>
<td>59.2</td>
<td>78.3</td>
<td>84.3</td>
<td>87.0</td>
</tr>
<tr>
<td>SiC-DPF</td>
<td>39.6</td>
<td>46.3</td>
<td>59.7</td>
<td>68.0</td>
</tr>
<tr>
<td>Sensors</td>
<td>53.3</td>
<td>63.7</td>
<td>58.7</td>
<td>69.0</td>
</tr>
<tr>
<td>Environment Business*¹</td>
<td>248.9</td>
<td>292.7</td>
<td>320.8</td>
<td>351.0</td>
</tr>
<tr>
<td>SPE related</td>
<td>80.1</td>
<td>96.9</td>
<td>107.0</td>
<td>88.5</td>
</tr>
<tr>
<td>Electronics components</td>
<td>27.9</td>
<td>29.5</td>
<td>25.6</td>
<td>26.0</td>
</tr>
<tr>
<td>Metal related</td>
<td>19.3</td>
<td>23.9</td>
<td>27.6</td>
<td>26.0</td>
</tr>
<tr>
<td>Soshin Electric CO.*³</td>
<td>6.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Digital Society Business</strong>²</td>
<td>134.2</td>
<td>150.3</td>
<td>163.2</td>
<td>140.0</td>
</tr>
<tr>
<td>Energy Storage</td>
<td>2.8</td>
<td>1.3</td>
<td>2.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Insulators</td>
<td>39.1</td>
<td>39.3</td>
<td>44.2</td>
<td>48.0</td>
</tr>
<tr>
<td>Industrial Processes</td>
<td>27.0</td>
<td>26.9</td>
<td>28.3</td>
<td>33.0</td>
</tr>
<tr>
<td>Energy &amp; Industry Business</td>
<td>69.0</td>
<td>67.5</td>
<td>75.3</td>
<td>84.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>452.0</td>
<td>510.4</td>
<td>559.2</td>
<td>575.0</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.
## Sales by Product (Semi Annual) (Bln. Yen)

<table>
<thead>
<tr>
<th></th>
<th>FY2022</th>
<th></th>
<th>FY2023 Forecast</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1H</td>
<td>2H</td>
<td>1H</td>
<td>2H</td>
</tr>
<tr>
<td>Honeycomb filters</td>
<td>40.0</td>
<td>41.4</td>
<td>45.2</td>
<td>37.8</td>
</tr>
<tr>
<td>GPF</td>
<td>18.4</td>
<td>18.4</td>
<td>24.9</td>
<td>19.1</td>
</tr>
<tr>
<td>Cd-DPF・LSH</td>
<td>39.8</td>
<td>44.5</td>
<td>42.9</td>
<td>44.1</td>
</tr>
<tr>
<td>SiC-DPF</td>
<td>27.2</td>
<td>32.5</td>
<td>34.0</td>
<td>34.0</td>
</tr>
<tr>
<td>Sensors</td>
<td>27.8</td>
<td>31.0</td>
<td>32.9</td>
<td>36.1</td>
</tr>
<tr>
<td>Environment Business</td>
<td>153.1</td>
<td>167.7</td>
<td>179.8</td>
<td>171.2</td>
</tr>
<tr>
<td>SPE related</td>
<td>59.0</td>
<td>47.9</td>
<td>41.8</td>
<td>46.7</td>
</tr>
<tr>
<td>Electronics components</td>
<td>16.4</td>
<td>12.2</td>
<td>11.7</td>
<td>13.8</td>
</tr>
<tr>
<td>Metal related</td>
<td>12.7</td>
<td>14.9</td>
<td>12.6</td>
<td>13.4</td>
</tr>
<tr>
<td>Digital Society Business</td>
<td>88.2</td>
<td>75.0</td>
<td>66.1</td>
<td>73.9</td>
</tr>
<tr>
<td>Energy Storage</td>
<td>1.1</td>
<td>1.7</td>
<td>0.7</td>
<td>2.3</td>
</tr>
<tr>
<td>Insulators</td>
<td>20.0</td>
<td>24.2</td>
<td>22.8</td>
<td>25.2</td>
</tr>
<tr>
<td>Industrial Processes</td>
<td>12.3</td>
<td>16.0</td>
<td>13.5</td>
<td>19.5</td>
</tr>
<tr>
<td>Energy &amp; Industry Business</td>
<td>33.4</td>
<td>41.9</td>
<td>37.0</td>
<td>47.0</td>
</tr>
<tr>
<td>Total</td>
<td>274.7</td>
<td>284.6</td>
<td>282.9</td>
<td>292.1</td>
</tr>
</tbody>
</table>
Consolidated Operating Results

Operating Income

Ordinary Income

Net Income Attributable to Owners of the Parent

Net Sales

(Bln. Yen)

FX Rate
USD
120 111 111 109 106 113 113 135 141 141
EUR
132 119 129 128 121 124 131 141 152

ROE
13.3% 8.8% 10.4% 7.6% 5.8% 7.9% 12.9% 9.0% 6.1%

EPS
163.28 112.71 142.42 110.35 84.73 121.61 226.56 177.47 128.26

Dividend
38 40 44 50 50 30 63 66 50

(Bln. Yen)
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.