



**NGK INSULATORS**

Integrated Report  
NGK REPORT 2024

2024



**NGK INSULATORS, LTD.**

NGK Group Integrated Report  
**NGK Report 2024**

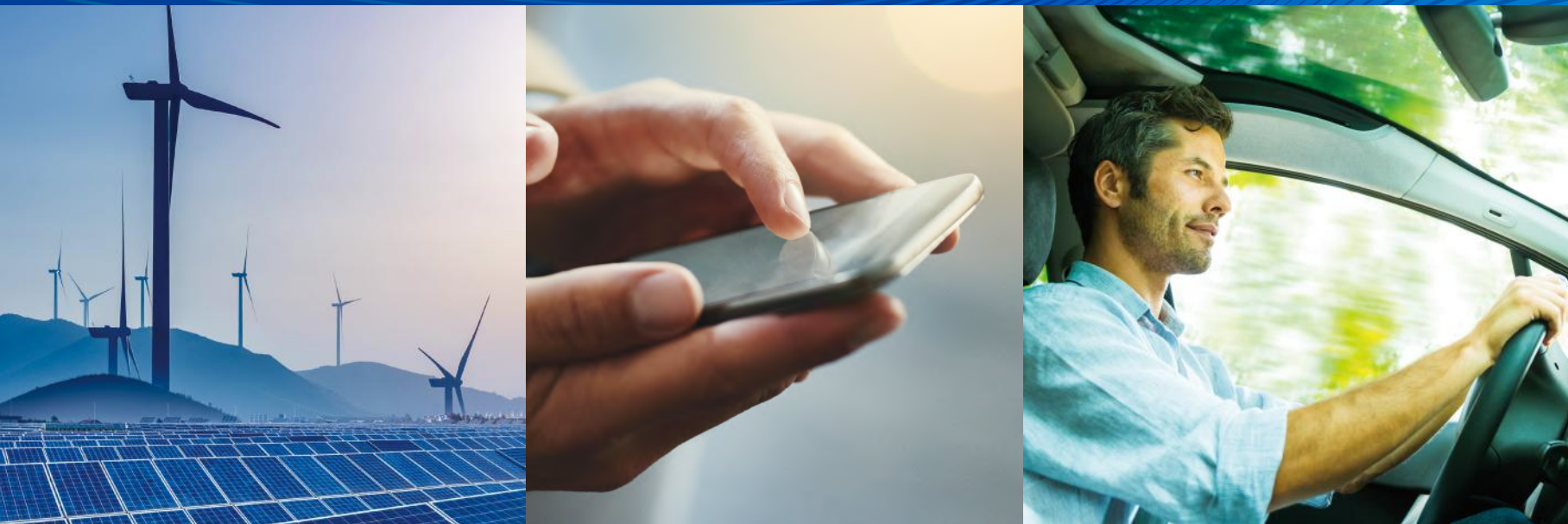
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# Surprising Ceramics.

The NGK Group has been using unique ceramic technologies to create innovative products for over 100 years.  
We will continue offering surprising products that provide new value to the world.



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Editing Policy

About the NGK Group Vision: Road to 2050

At a time when the world is entering a period of great change, we formulated the NGK Group Vision: Road to 2050 in April 2021 in order to become a corporate group that creates value for today's society as well as for the society of the future.

The NGK Group Vision envisions what the future society may look like in 2050 and establishes the social issues that we will focus on, which are the realization of carbon neutrality (CN) and digital society (DS). For CN and DS, we will work to expand the fields in which our products are actively utilized by further refining the unique ceramic technologies that we have accumulated so far. To that end, we have established the Five Transformations to indicate "what we must do" in the future in order to achieve self-transformation.

Purpose and Positioning of NGK Report 2024

The NGK Group positions NGK Report 2024 as a critical communication tool. The Report provides a comprehensive summary of our Group's enterprise value improvements. The objective of this Report is to help shareholders, investors, and our many other stakeholders gain a better understanding of our Group. This Report is comprised of four sections, including a section on specific efforts related to new value creation and a section outlining the initiatives we will undertake towards realizing the NGK Group Vision: Road to 2050.

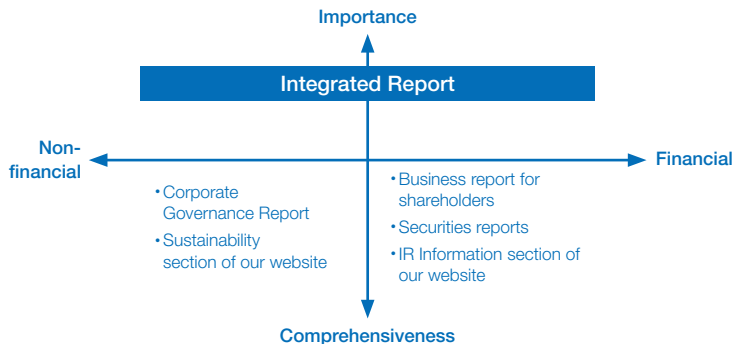
- Message from the President: Commitment to and Policies for Realizing our Vision
- Realizing our Vision: Our Objectives and Foundation for Realizing Them
- Improving Enterprise Value: Ensure Growth Potential, Enhance Capital Profitability, and Upgrade Non-financial Value
- Sustainable Value Creation: Ensuring Management Transparency and Upgrade Compliance in our Business Activities



During the creation of the NGK Report, we referenced the Integrated Reporting Framework by the International Integrated Reporting Council (IIRC) recommended by IFRS Foundation and Guidance for Collaborative Value Creation by the Ministry of Economy, Trade, and Industry. Furthermore, we provide details on our ESG information via the NGK Group Sustainability Website Data 2024.

Applicable Organizations	Applicability will vary with each organization. As such, applicable organizations are indicated in report articles and alongside the presented data.
Applicable Period	April 1, 2023 to March 31, 2024 (some information not pertaining to the current fiscal year is also included)

Positioning of Corporate Media



**About Forward-Looking Statements**

Earnings forecasts and other forward-looking statements indicated in this report are based on currently available information and certain assumptions deemed reasonable at the time of creation. However, please note that it is possible actual results could differ from the statements presented in this report due to various factors.





President

*Shigeru Kobayashi*

Profile

Joined in 1983. Has served in numerous roles in the company, including working in overseas sales and marketing in the Energy Infrastructure Business Division before becoming Manager of sales and marketing department of the NAS Battery Business Division, serving as President of an overseas subsidiary, Manager of overseas sales and marketing department for the Ceramic Products Business Group, and as Group Executive of the Energy Infrastructure Business Group. Kobayashi assumed the role of President of the NGK Group in April 2021.

Kobayashi will lead the charge towards realizing the NGK Group Vision based on a philosophy of "creating a company that is a source of pride and trust for all our stakeholders."

# Continuing to Innovate and Take on Challenges.

Incorporate various perspectives, take on challenges,  
And build trust-based relationships with stakeholders.

## Looking back on 2023

In May 2023, COVID-19 was reclassified as a Class 5 Infectious Disease in Japan. Bullet trains were once again operating at near full capacity as the country seemed to see a sudden invigoration of consumer activity. And for the first time in a while, I was even able to see numerous employees enjoying their meals in our employee cafeteria.

Witnessing these changes made me feel that the sense of confinement that had enveloped all of society had finally been lifted. Last year also left me with a great awareness of the importance of an open society in which people are able to move freely and meet and converse with others.

We also saw a string of scandals involving various corporations. This reinforced within me the importance of building trust-based relationships with stakeholders. In 2018, we too caused an incident related to insulators and related products in which we failed to conduct testing procedures in accordance with the parameters outlined in customer contracts. I believe this issue can largely be attributed to our relations with employees and other stakeholders as well as factors rooted in our corporate culture. If the culture creates an environment in which employees are unable to speak freely or say "No" when something is not possible, then it is only a matter of time before that environment has a negative impact on the company.

Existing as a company that is trusted by stakeholders and that serves as a source of pride. I have renewed my commitment to ensuring we continuously position this promise at the center of business.

## Changes in external environment

Looking at the external environment, I feel that society has seen continuous change due to the tense situation happening in Ukraine since 2022. Soaring energy costs and the resulting rise in price hikes overseas. Furthermore, the interest rate hikes implemented by various governments in response to price hikes created an interest rate differential between Japan and the rest of the world, triggering extreme yen depreciation that caused the price hikes in Japan to rise as well. The external environment has seen various actions and chain

reactions. It is a forceful reminder that markets, by their very nature, will always be subject to change.

An earthquake struck the Noto Peninsula on New Year's Day, 2024, and it has been predicted that other regions will experience major earthquakes, including the possibility of a Nankai Trough earthquake. It goes without saying that these natural disasters can also cause markets to undergo major changes. It is important that we recognize that such change is unavoidable and examine what preparations we must make to ensure our ability to respond flexibly to such change.

In response to these conditions, NGK is working to improve productivity. We are pursuing the visualization of our engineering chain and our supply chain, and over the past few years have promoted DX to increase our productivity. I think creating an environment that allows every individual to autonomously engage in such diligent efforts will lead to us being prepared to respond to change.

At the same time, the conditions directly influencing our business are undergoing various changes.

For example, the automotive industry, which faced stagnant manufacturing due to semiconductor shortages caused by COVID-19, is now seeing a rapid increase in manufacturing numbers. We also saw the rise in energy prices trigger changes in the energy policies of various countries and drive demand for storage batteries. While this situation can be viewed as a business opportunity, the semiconductor market has remained sluggish despite expectations for continued growth. Smartphone and PC sales have declined dramatically due to the impact of high prices and a drop in demand in China. This has caused stagnation on the markets of the electronic parts used in such devices. Similarly, data centers, which were expected to see continuous demand growth driven by the explosion in data, have seen a temporary downturn. Overall, we are continuing to see unexpected changes in markets. In particular, markets related to digital have seen fluctuations so drastic as to drive concerns about the dangers of a sudden market stagnancy.

## Profitability improvement that is not influenced by market changes

One of the Five Transformations we outline in the NGK Group Vision, Road to 2050, is profitability



improvement. However, looking back on FY2023, in how operating income failed to reach targets, it was a year during which our results did not match our goals.

Certainly, some of that can be attributed to sluggish performance by the Digital Society Business, which was impacted by the aforementioned decline in smartphone and PC demand. Also, during the first half of the previous fiscal year, the automotive industry hadn't yet recovered from the decline in manufacturing numbers caused by the semiconductor shortage. However, those were not the only factors. While raw material prices were high, the reality is that we failed to sufficiently reflect those cost increases in our sales prices. Even in times of dramatic changes in our market environment, we must improve profitability through continuous cost reductions and strategic price revisions.

Moving forward, the semiconductor industry will return to a growth trajectory, with market scope expected to nearly double in size to one trillion dollars by 2030. Ahead of such rapid growth, we must focus on developing new products in the digital sector and be prepared to launch those products to market. The transition to electrified

vehicles is also not progressing as originally assumed due to issues such as insufficient charging infrastructure and the high cost of batteries. However, sales of hybrid vehicles have grown significantly and progress is advancing in fields such as autonomous driving. This suggests that digital demand in automotive industries could see further growth in the future.

From 2030 onward, we expect to see the acceleration of initiatives related to creating social frameworks for reducing greenhouse gases as the world moving to realize carbon neutrality. While it remains unclear what will take center stage as an alternative energy to fossil fuels, what is clear is that we must collaborate with partners in various sectors to advance preparations and ensure our ability to respond, regardless of which energy systems are adopted by society.

**NV1000 results and future outlook**

While we did fall short in some areas, we also had some major successes in FY2023. Aiming for 2030 sales of 20 billion yen by 2030, we decided to



*Collaborate with various businesses to accelerate product development for a digital society and carbon neutrality.*

*Aiming for new product net sales of 100 billion yen in 2030. We will steadily advance initiatives towards achieving New Value 1000.*

expand production capacity for AMB substrates for power semiconductor modules by 250 percent and we launched an organic compound crystal search service based on proprietary infrared technology. We also made steady progress towards New Value 1000 (NV1000), our plan to achieve net sales of 100 billion yen from new products by 2030. Another success was many employees came to embrace a greater awareness of NV1000. This has been a transformation from waiting around for someone to launch a new business to taking the initiative towards beginning something new. I feel that I am seeing more employees taking a vested interest in pursuing company growth.

In the past, there was an aspect of our culture in which, once R&D decided on a development theme and activities got underway, there was no stopping that process even when concerns were raised about a lack of sales potential. To address this, when we launched NV1000, we also established NV Gate Promotion Meetings, which serves as an opportunity for discussion midway during the process of proposal through commercialization. This serves as a framework that promotes thorough dialogue to help find the missing link between R&D and commercialization and deliberate on how to address issues.

This new framework not only allows us to better select development themes at an early stage, but also creates an environment for helping people embrace the reality that not all initiatives end in success. As I mentioned earlier, I believe people are able to more freely take the approach of, "Well, I might fail, but it's still worth trying."

New products we are currently developing towards realizing carbon neutrality include direct air capture (DAC) ceramics which absorb and recover carbon dioxide from the atmosphere, and sub-nano ceramic membranes, which separate specific gases and liquids from mixed gases and liquids at the molecular level. These types of products are successes achieved by taking on

challenges. Also, our organic compound crystal search service and NR-Power Lab Co., Ltd., a power operator founded jointly with Ricoh Company, Ltd., were major gains for the NGK Group and represent our expansion into businesses focused on providing services beyond manufacturing.

To further promote the development and commercialization of products related to the digital society, we also started work on the construction of a new R&D building. From this new co-creation center, NGK will more concretely disseminate information about our history, current initiatives, group vision, technology, and strengths to our customers and partner businesses. This new center will also promote new creation by serving as a place of interaction between internal and external personnel and where we can better listen to the concerns of our customers.

NV1000: For details, see [P.31-36](#).

**The key to growth is utilizing intangible assets**

We position intellectual property strategy as one of the keys to future growth. Thus far, our focus has been on a defensive strategy through which development and business departments collaborate to apply for patents and obtain rights for developed technology, and to conduct investigations to ensure that we are not infringing on competitor patents. Of course, this importance of this strategy remains unchanged. However, in addition to this defensive strategy, I also want to develop an aggressive intellectual property strategy that will lead to new business creation.

Specifically, we will use IP Landscape, which analyzes intellectual property information, to analyze global trends in new technology and industries. We will also work with partner companies to develop strategies related to how we

can use our technology and patents to meet customer needs and identify what patents we need to turn that strategy into a business. I want to create a system that enables the integrated promotion of business, development, and intellectual property strategies.

The reason we reorganized our former Intellectual Property Department and created the new I P Strategy Department was to create clarity in this area. Using this department as a base, we will proactively foster an intellectual property mindset, review and strengthen our activity structure, and improve our intellectual property capabilities.

DX strategy also remains an important element. At manufacturing sites, awareness regarding digital technology has already changed significantly, and the use of data and digital technology has progressed steadily. At the same time, there are areas in the head office and back-office departments where digital adoption has not progressed sufficiently.

We outlined a DX Promotion Roadmap in the NGK Group Digital Vision. Stage 1, Building a foundation for digital utilization, was completed in 2023. We launched Stage 2, Establishing a promotion system and accumulating results, in 2024. We plan to enhance our use of digital technology in all areas, including data-backed decision-making in management and operational efficiency at the head office and back-office departments.

It goes without saying that it is our human capital who supports these changes. Outlined in Our Values is the concept of “Quality of People | Embrace challenges and teamwork”. ESG as a foundation of our management and one of the Five Transformations we are pursuing, we identify the recruitment and cultivation of human resources as critical to achieving our vision, what we want to be in 2050. In FY2023, we further solidified this stance by formulating the NGK Group Human Capital Management Policy. Based on this policy, we exchanged opinions with domestic Group companies. In the future, we plan to share this information with overseas Group companies.

The world today is one in which new businesses and products must be created quickly. This makes it critical that we create an environment in which diverse people with new perspectives, values, experience, and skills can thrive and flourish. Currently, 60 percent of Group employees have roots outside of Japan. We use that trait as

an opportunity to receive feedback based on diverse perspectives as we work to achieve a truly global awareness.

We will also focus on creating opportunities for women. In March 2024, we were selected as a Next Nadeshiko Company that Supports Dual-career and Co-parenting, a list of companies jointly selected by the Ministry of Economy, Trade, and Industry (METI) and the Tokyo Stock Exchange (TSE). I believe this is recognition of our efforts thus far. Moving forward, we will further focus on creating a system that allows employees to play an active role in positions close to management, regardless of gender.

Furthermore, I also want to expand mid-career hiring of people with experience in a variety of fields to incorporate new perspectives.

Utilization of intangible assets: For details, see [P.41-47](#).

**Existing as a company that is trusted by society**

I believe that a company’s existence is meaningless unless it contributes to resolving social issues. At the NGK Group, our purpose is to contribute to society by using ceramic technologies to resolve social issues. Across generations and in the face of a changing environment, we must never stray from this guiding principle.

My greatest dream is to use ceramic technologies to contribute to reducing greenhouse gases. At the same time, reducing greenhouse gases is a major medium-term issue for our Company, and our greatest mission. Ceramics can certainly lead to resolving the social issues that in turn help prevent global warming. I hope to fulfill this mission by collaborating with other companies towards accomplishing what we cannot achieve on our own.

Fortunately, we have massive amounts of experimental data that we have accumulated over the 100 years since our founding. Furthermore, thanks to advances in technologies such as MI (materials informatics), it is possible to use AI to significantly improve efficiency in areas that previously relied on human intuition and experience. I am confident that we have the power to create more products that can contribute to society if we listen carefully to customer feedback.



*We will link greenhouse gas reduction and other contributions towards resolving various social issues to improvements in enterprise value.*

**No growth without challenge**

I believe that the most important critical mission of a company is to be trusted by its stakeholders. I view enterprise value as an expression of how much a company is contributing to the world.

Of course, financial value such as stock price and PBR (price/book value ratio) are very important. In particular, meeting shareholder expectations and increasing stock prices requires more than simply improving business performance; NGK must also have the ability to create new products and services. We must also be able to raise the expectations of shareholders and investors by disclosing and disseminating information related to this process of creation.

To that end, what I want to promote is the concept of challenge. While the NGK Group has a serious corporate culture and is skilled at carrying out clearly defined tasks, we lack the spirit of challenge; the approach of “Well, I might fail, but it’s still worth trying.”

However, growth cannot come without challenges. Fear of risks and failing to take on challenges, can itself become the biggest risk to the NGK Group.

If we fail, then we can try again and again. The accumulation of failures becomes the experience that leads to the next success. We must foster a culture that encourages people to take on challenges when there is no guarantee of success and a culture that supports those challenges.

This is not something we can do alone by isolating ourselves. It is important that we interact with others both inside and outside NGK. This includes interaction between the technology and sales departments as well as collaborations with external partner companies. I am confident that new discoveries are inspired by ideas, vitality, and power that differ from your own.

To achieve our ultimate goal of becoming a company trusted by all stakeholders. The NGK Group will continue to move forward and pursue constant innovation and challenges.



## Philosophy and Vision

We formulated the NGK Group Vision to serve as a milestone on our way to realizing the NGK Group Philosophy.

Since its founding, the NGK Group has carried on the spirit “NGK products and technologies must create new value and contribute to the quality of life” as expressed by the NGK Group Philosophy. In 2019, which marked the 100th anniversary of our Company, we revised how our philosophy was organized and established the NGK Group Philosophy.

## NGK Group Philosophy

## Our Mission

**Enriching Human Life  
by Adding New Value to Society.**

## Our Values

Quality of

**People** Embrace challenges and teamwork.

Quality of

**Product** Exceed expectations.

Quality of

**Management** Social trust is our foundation.

Visit the “About NGK” section of our website to read the NGK Group Philosophy.  
<https://www.ngk-insulators.com/en/info/philosophy/>

The NGK Group Vision: Road to 2050 clarifies our ideal vision, which is the company that we want to be in 2050, and outlines what we must do to achieve this vision in order to realize our mission of “Enriching Human Life by Adding New Value to Society” as expressed in the NGK Group Philosophy.

## NGK Group Vision:

## Road to 2050

## What we want to be

**A company to contribute to  
carbon neutrality and digital  
society with our unique ceramic  
technologies**

## What we must do

**Convert our business structure  
through 5 Transformations**

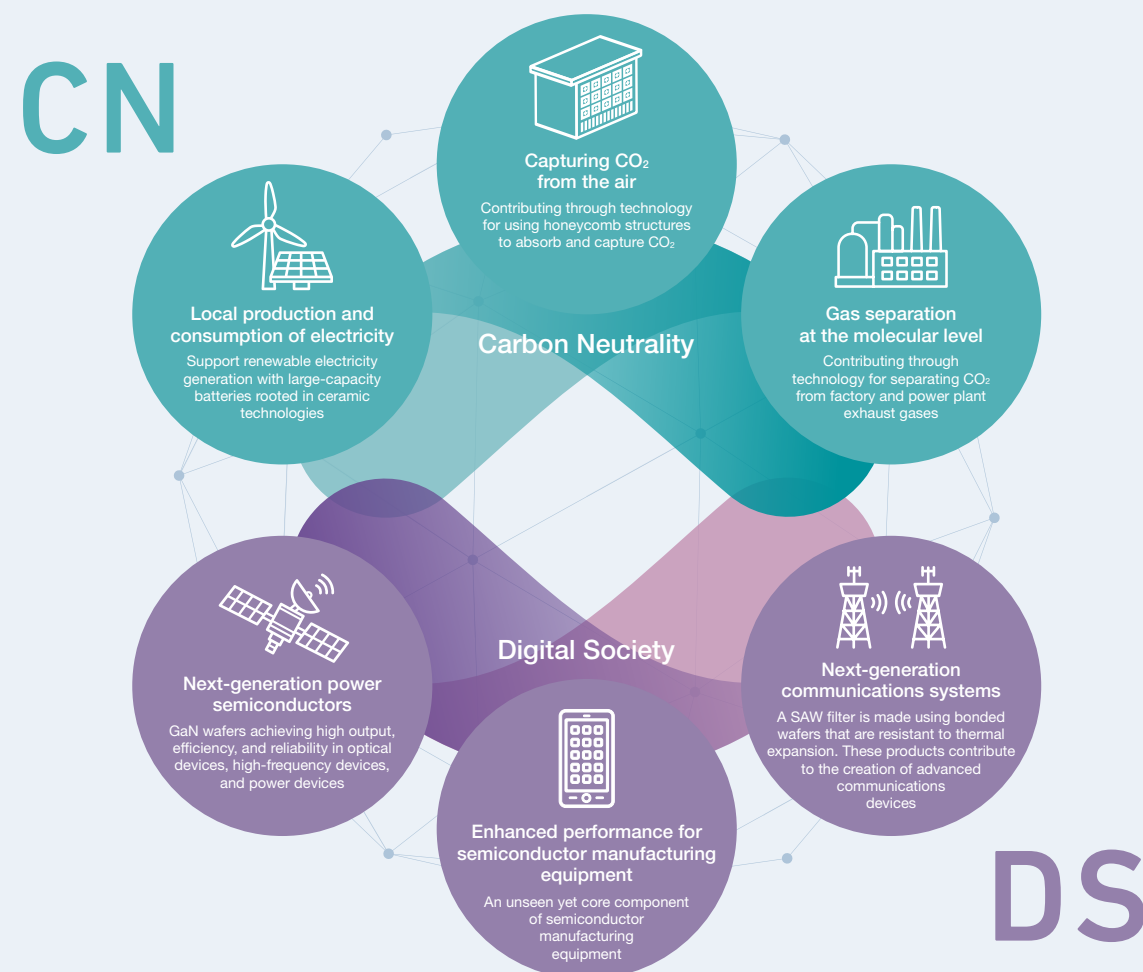
NGK Group Corporate Business Principles  
NGK Group Code of Conduct



Firm compliance with NGK Group  
Basic Guidelines for Compliance Activities

## Challenging the Future to Realize our Vision

Through Five Transformations, we are taking on the challenge of transforming our business structure to maintain our position as a company that continues to be valued by society in the future.



### Envisioned Society of 2050

For the envisioned society of 2050, it is assumed that actions to protect the global environment will be widely accepted along with the concept that companies should act in an ethical and just manner, and that renewable energy will be the key source of electricity and other forms of energy. With the advancement of AI, people's life as well as industries that support society will experience an innovative level of efficiency with people and things connected more seamlessly than they are today. Envisioning this type of society in 2050, we thoroughly discussed business areas that would provide the biggest opportunities for the NGK Group. As a result, we decided that we will contribute to the two areas of carbon neutrality (CN) and digital society (DS).

### Value Creation in 2050

In order to realize carbon neutrality (CN), a state in which the natural environment and humans can coexist, and a digital society (DS), in which people can live safely, conveniently, comfortably, and healthily, we will further refine our unique ceramic technologies that we have accumulated for over more than 100 years and contribute to solving social issues in the future by providing technologies that were difficult to provide in the past from a technical standpoint. The NGK Group already possesses several promising new products. We will create new products and services in the future to provide new value.

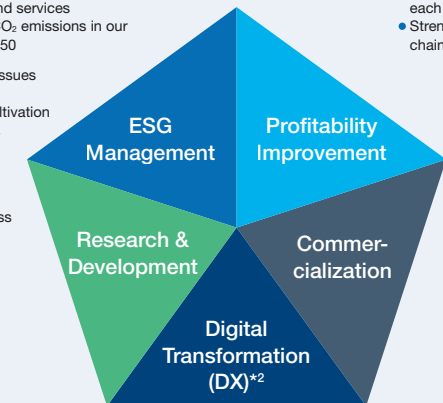
## 5 Transformations

In order to respond to rapid changes in the business environment, the NGK Group is moving toward self-transformation by creating value through its own ideas and technologies as well as taking on the challenge of co-creating value through collaboration with other companies in CN/DS-related fields.

In order to realize our vision, what we want to be in 2050, what we must do is to transform our business structure through the Five Transformations. We will make ESG the core of our management, enhance our earning power, create a cycle for growth, and promote R&D as well as product development. We will also promote digital transformation—the propulsion for the whole transformation. Through these efforts, we will take on the challenge of creating new value in CN/DS-related fields.

### ESG as a foundation of management

- E** NGK Group Environmental Vision: Contributing to achievement of CN through products and services. Realizing net zero CO<sub>2</sub> emissions in our own activities by 2050.
- S** Solutions to social issues through businesses. Recruitment and cultivation of human resources.
- G** Gradual reform of governance. Development of a culture of openness.



### Achievement of 'New Value 1000'

- Attain more than 100 billion yen of sales in newly launched businesses\*1 in 2030
- Investment of 300 billion yen in R&D over the next 10 years
- Concentration in the CN and DS areas (80%)

\*1 Businesses just launched and to be newly launched in the future

\*2 DX: Digital Transformation. Transform business models and corporate structure with digital technology

\*3 NGK ROIC (see page 28)

### Increase of earning power, creating a cycle for growth

- ROIC\*3/Analysis and improvement of profitability in each business
- Strengthening entire process chain

### Reinforcement of societal implementation of our products

- Improvement of cross divisional marketing capabilities
- Expansion of collaboration with outside partners
- Expanding solution business

### Propulsion for the whole transformation

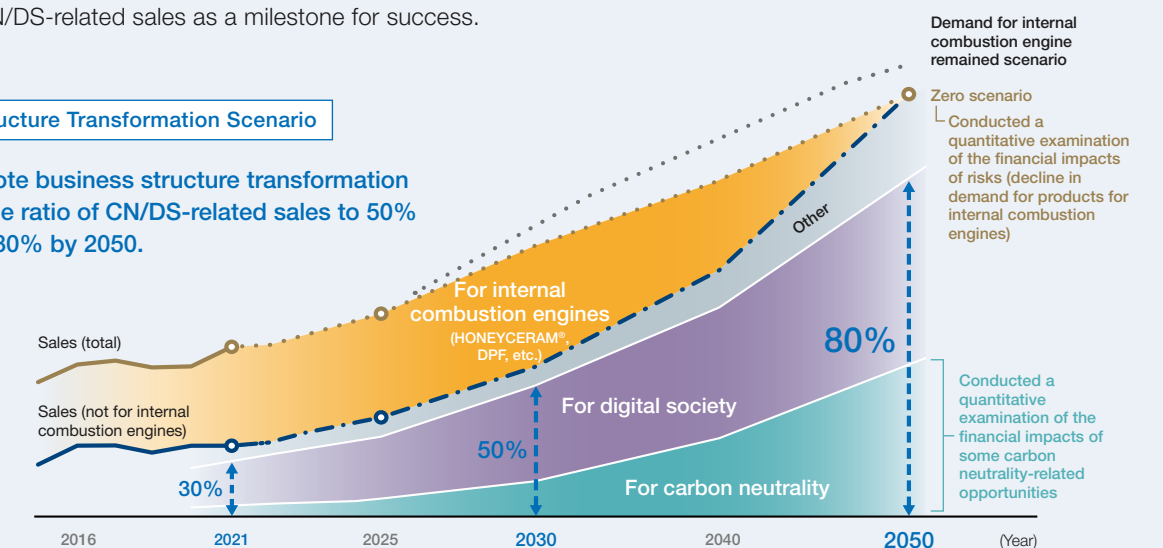
- Digitization of all processes in the company
- Training of IT liaisons in each division

## Undertaking the Challenge of Transforming Our Business Structure

With EVs and other developments, the automotive industry is facing a once-in-a-century paradigm shift. As a Group with roughly 60 percent of our net sales attributable to products for internal combustion engines such as HONEYCERAM® catalytic converters for automotive emissions control, diesel particulate filters (DPF), the global EV shift represents a major crisis for us. Despite expectations for growth in products for semiconductor manufacturing equipment, our sustainable growth is contingent on our ability to foster businesses related to carbon neutrality (CN) and digital society (DS) that will serve as new pillars of growth. Positioning this initiative as our third founding, we are transforming our business structure and setting growth in the ratio of CN/DS-related sales as a milestone for success.

### Business Structure Transformation Scenario

We will promote business structure transformation to increase the ratio of CN/DS-related sales to 50% by 2030 and 80% by 2050.





## Sustainable Growth Trajectory

Transform business into a structure for sustainable growth by continuously creating products that contribute to resolving social issues.

### The Key to the Growth

#### Uniformity

Aim to provide high-quality products and earn the trust of customers around the global by achieving globally uniform product quality.

#### Business diversification

Focused on ceramic technologies, achieve the diversification of business by developing products that help resolve social issues.

### 1919 to 1960s

#### Modernization of Japan, Japan's advanced economic growth

- Social infrastructure development
- Expansion of light industries, heavy chemical industry

Respond to growing electricity demand to contribute to lifestyles and industry development

#### 1919 The starting point of NGK

#### Work not for company profit, but for benefit to society

The history of the NGK Group began with a decision by our first president, Kazuchika Okura. Using a US-made insulator as a hint, Okura developed insulators capable of withstanding high voltages to respond to increasing electricity demand being driven by social and industrial development.

**1931** Acid-resistant machinery for the chemical industry

**1958** Beryllium copper

### 1970 to 1990s

#### Popularization of automobiles, environmental issues, information society

- Global advancement of motorization
- Air pollution problems and global warming
- Development of the electronics industry

Develop and disseminate products contributing to environmental protection

**1976** HONEYCERAM® catalytic converters for automotive emissions control

**1978** Low-level radioactive waste treatment equipment

**1989** Diesel particulate filters

**1996** NOx sensors for automotive emissions

**1996** Ceramics for semiconductor manufacturing equipment

### 2000 to 2010s

#### Advanced information society, global environmental issues

- Progress towards mobile network society
- Strengthening of global warming prevention measures
- Promotion of a resource recycling society

Achieve value co-creation through semiconductors and renewable energy to contribute to the creation of more pleasant lifestyles

**2003** NAS® batteries

**2012** Gasoline particulate filters

**2014** Bonded wafers

**2015** Micro-actuators for HDDs

**2018** Gallium nitride wafers FGAN®

**2019** Lithium-ion rechargeable battery "EnerCera®"

### 2020 and into the future

#### Advancement towards sustainable society

- Carbon neutrality promoting harmony between the natural environment and people
- Digital society enabling people to live safe, convenient, pleasant, and healthy lives

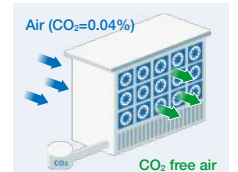
Respond to expectations as a global company and challenge ourselves to resolving new social issues

#### CN

Carbon Neutrality

#### Direct Air Capture (DAC) Ceramics

Uses technology for directly capturing CO<sub>2</sub> in the air to contribute to CO<sub>2</sub> reductions. Strength lies in having the optimal combination of a honeycomb structure and CO<sub>2</sub> absorbing materials.

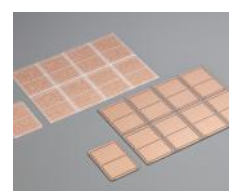


#### DS

Digital Society

#### AMB and DCB substrates for power modules

Power semiconductor mounting substrates that control electricity conversion in motor controller and other devices. Demand for applications in vehicle electronics increasing with global advancements in EV.

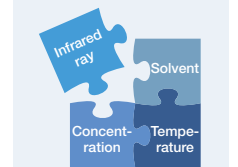


#### Other

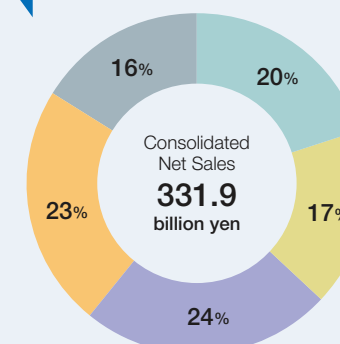
For pharmaceutical development

#### Organic compound crystal search service business

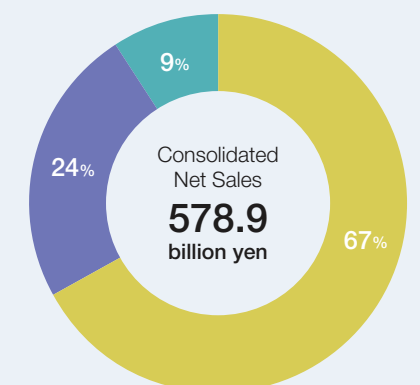
The world's first organic compound crystal search service that uses infrared ray at a specific wavelength. Contributes to more efficient pharmaceutical development.



### Performance from each business nearly equal



FY2000



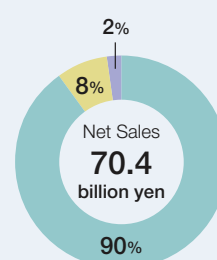
FY2023

### Social issues

### Products that contribute to resolving social issues

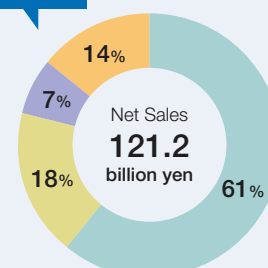
### Transforming our business structure

- Environment Business
- Digital Society Business
- Energy & Industry Business
- Materials Business
- Business transferred to another company in 2003
- Environmental Equipment Business
- Established a merged company, METAWATER CO., Ltd. with Fuji Electric Co., Ltd. in 2008.



FY1960

### Business diversification



FY1980




NGK Group Strengths

Using the sources of our strength, we will further polish our proprietary ceramic technologies to create new value while ensuring growth potential.


Strengthening New Value Creation

Sources of our strength




**A corporate spirit rooted in a commitment to serving society**

Kazuchika Okura, the founding president of the NGK Group, said, “We do this to serve our country, and not for our own profit and provide Japan with its own, domestically manufactured insulators.” That intention, which led to the decision to start domestic production of insulators, is still alive and well today in the NGK Group Philosophy of “Enriching Human Life by Adding New Value to Society.” This corporate spirit has led to the birth of many products in the world.




**Over 100 years of accumulated materials technologies and production technologies**

Since our founding, we have accumulated a variety of technologies with the stance of thoroughly bringing out the potential of a single technology. That has led to the creation of our unique ceramic technologies (indicates technologies that combine the core technologies such as materials technologies, Production/Process Technologies, and Analytical/Evaluative Technologies, like puzzle pieces to create products).



**Co-creation with customers, suppliers, and research institutes**

Through collaborative creation with customers, suppliers, and research institutes, we are creating a variety of new values, including the value created by solving problems together with customers, the value of realizing the quality improvement and stable supply of products, and the value that leads to innovation such as the development of new technologies and products.



**Human resources dedicated to taking on challenges with persistence**

Human resources who are committed to taking on challenges many times without giving up, are particular about customer needs, are particular about products that only the NGK Group can produce, and are particular about differentiating technologies. These dedicated human resources are shaping the future of the NGK Group.

Sources of NGK Group strength that are not easily mimicked by competitors

**Materials Technologies**

These technologies are used to create ceramics with dramatically superior properties by manipulating materials in a transformational manner based on a thorough understanding of the mechanical, thermal, electrical, and chemical properties of ceramics.

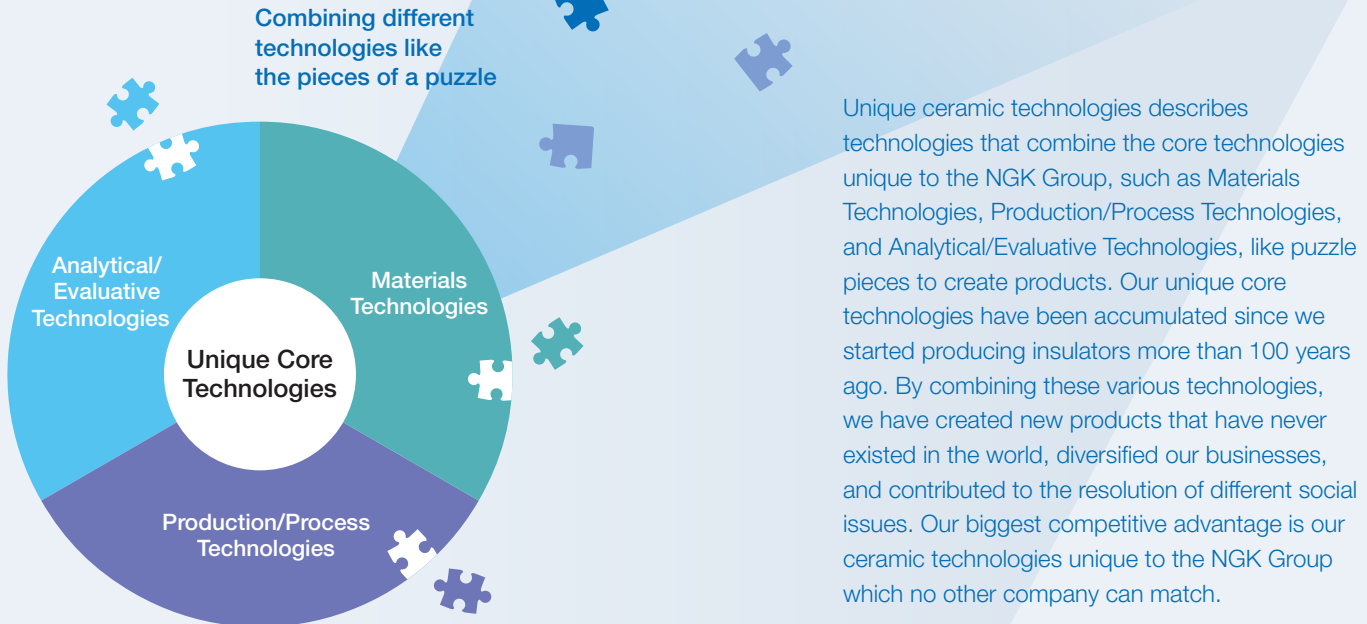
**Production/Process Technologies**

Many innovative and highly competitive products are made using manufacturing equipment developed by the NGK Group. These technologies are used to create a variety of products by combining molding technologies, such as casting, extrusion molding, and tape casting, as well as firing and processing technologies.

**Analytical/Evaluative Technologies**

These technologies are used to produce high-quality products through the use of advanced computer simulation technology that enables shorter development lead times and inspection technology that does not overlook even the slightest defects.

Combining different technologies like the pieces of a puzzle







Unique ceramic technologies describes technologies that combine the core technologies unique to the NGK Group, such as Materials Technologies, Production/Process Technologies, and Analytical/Evaluative Technologies, like puzzle pieces to create products. Our unique core technologies have been accumulated since we started producing insulators more than 100 years ago. By combining these various technologies, we have created new products that have never existed in the world, diversified our businesses, and contributed to the resolution of different social issues. Our biggest competitive advantage is our ceramic technologies unique to the NGK Group which no other company can match.

Enhancing the sources of our strength

**The Key to Our Future Growth**

By applying the sources of our strength, our Group has continuously polished our proprietary ceramic technologies to establish a competitive advantage that cannot be mimicked by our competitors. We will continue enhancing the sources of our strength and link those efforts to sustainable growth by providing new products and services that contribute to resolving social issues.

Sources of our strength	Pages related to the sources of our strength
<div><p>A corporate spirit rooted in a commitment to serving society</p></div>	<ul style="list-style-type: none"><li>● NGK Group Philosophy</li><li>● NGK Group Vision</li></ul> <p>Without changing the fundamentals of our basic philosophy, we will update the company to shift our trajectory towards meeting modern society's demand for making contributions to CN and DS</p> <p>P.9-10</p>
<div><p>Over 100 years of accumulated materials technologies and production technologies</p></div>	<ul style="list-style-type: none"><li>● Promoting IP Strategy and DX</li></ul> <p>Utilize accumulated knowledge more effectively and efficiently, including building barriers to entry, input for strategy formulation, and using data to speed up commercialization</p> <p>P.41-44</p>
<div><p>Co-creation with customers, suppliers, and research institutes</p></div>	<ul style="list-style-type: none"><li>● NV1000 and Collaborations with Business Partners</li></ul> <p>Strengthen market-oriented perspective and collaborate with business partners to accelerate the creation of new businesses that better leverage proprietary ceramic technologies</p> <p>P.31-36</p>
<div><p>Human resources dedicated to taking on challenges with persistence</p></div>	<ul style="list-style-type: none"><li>● Human Capital Strategy</li></ul> <p>Promote human capital strategy that is aligned with management strategy, not only engineering personnel, but also personnel capable of bringing technology to market</p> <p>P.45-47</p>

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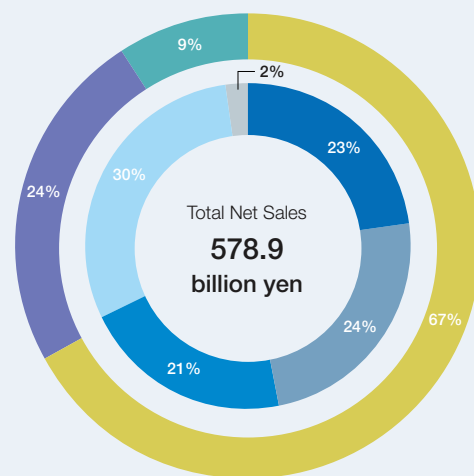
NGK REPORT 2024

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## At a Glance

## At a Glance



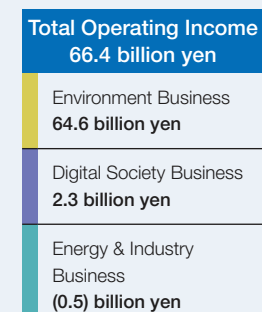
## Sales by Region



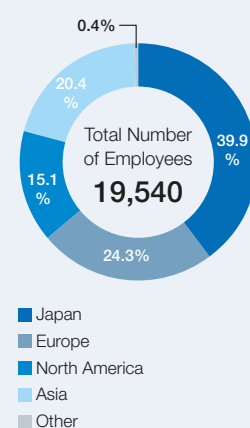
## Sales by Business Segment



## Breakdown of Operating Income by Business Segment



## Employees by Region



## Global Expansion

Business network  
**19** countries

Group companies  
**36** companies  
(of which, 18 are manufacturing companies)

(Figures as of March 31, 2024)

\*From FY2024, we changed the reporting segment for the Industrial Process Business from Energy & Industry Business to Environment Business. Net sales and operating income are based on revised reporting segments.

## Environment Business

Offering industrial equipment and devices that contribute to manufacturing process innovation and productivity increases. Some of our products include ceramic substrates for automotive catalytic converters for emissions control, filter products for eliminating particulate matter (PM) (diesel particulate filters (DPFs), gasoline particulate filters (GPFs)), and NOx sensors for measuring nitric oxide (NOx) in automobile emissions. We are focused on the development of next-generation products and technology for markets related to carbon neutrality, which are expected to expand globally.

## Strengths

- Materials technology, product development, mass production technology, and the experience and capabilities to commercialize these technologies
- Ability to flexibly respond to the laws and regulations, regional characteristics, and demand trends of various nations, proposal capabilities for automotive companies
- Long-term relationships and networks with a broad range of industries
- Ability to propose value and solutions, including engineering

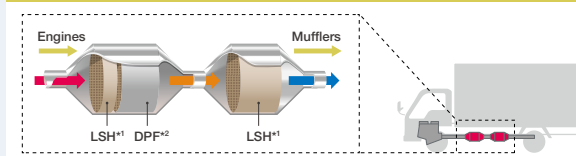
## Major markets

- Automotive markets
- Domains related to industrial equipment

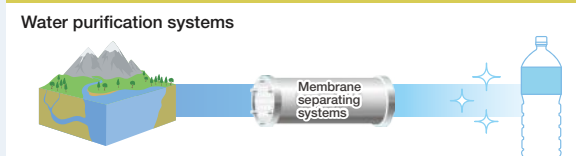
## Major customers

- Automobile manufacturers
- Electronic component manufacturers
- Pharmaceutical manufacturers
- Chemical product and steel manufacturers

## Examples of usages for ceramics for emissions control



## Examples of membrane separating systems



\*1 Large-size HONEYCERAM® \*2 Diesel particulate filter

## Ceramics for purifying automobile emissions control

DPFs and GPFs are installed between the engine and the muffler to achieve next-level PM capture while minimizing low pressure loss. Through materials and molding technology cultivated over numerous years, we achieve durability and performance suited for various usage environments. Our NOx sensors are equipped with an element that comprises a zirconia oxygen pump function. These sensors are installed in the front and back of the selective catalytic reduction (SCR) devices of diesel vehicles to contribute to reducing NOx emissions by detecting NOx concentrations in real time.

## Membrane separating systems

Offering a wide selection of products, from ceramic membrane filters for precision filtration to high-performance membranes suitable for CO<sub>2</sub> gas separation and filters for high-temperature gas dust collection. We are involved in the engineering of both ceramic and organic membranes. Our products are used in the beverage and food domain, medical water manufacturing equipment, electronic materials, chemicals, semiconductor manufacturing processes, and even waste drainage treatment.

## Digital Society Business

We manufacture and sell products including ceramics for semiconductor manufacturing equipment. These products contribute to increased productivity in manufacturing processes, piezoelectric micro actuators required for the precision positioning of magnetic heads used to read and write data, and beryllium copper products that enable increased reliability and size reductions for electronic devices.

## Strengths

- Using proprietary material technology and manufacturing processes to engage in domains in which our competitors struggle to pursue
- Communicating closely with customers to develop high-added-value products

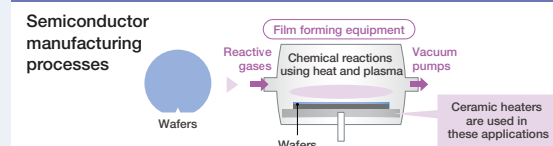
## Major markets

- Semiconductor markets
- Electronic parts markets

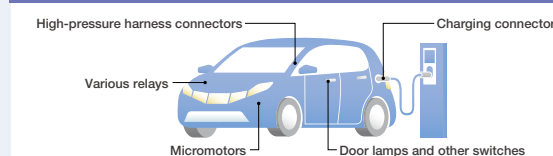
## Major customers

- Semiconductor manufacturing equipment manufacturers
- HDD manufacturers
- Communications device manufacturers

## Usage examples for ceramics used in semiconductor manufacturing equipment



## Usage examples of beryllium copper products



## Ceramics for semiconductor manufacturing equipment

A stage for uniformly controlling the temperature of silicon wafers in the membrane forming process in semiconductor manufacturing. This stage uses a proprietary structure comprising a shaft joined to the bottom of the heating element stage on which the wafer is placed. This structure works to protect terminals and conductors from high-temperature plasma and corrosive gases.

## Beryllium copper products

Features the superior electrical and heat conductivity of copper combined with high strength and durability. These products are used in a wide range of fields as materials for conductive springs and contact points, including in automobiles, home appliances, and communications infrastructure. Amid the growing need for charging connectors in EV markets, expectations are growing that these products will provide the contact reliability that is critical to performance improvements.

## Energy &amp; Industry Business

In addition to the insulators and wiring devices that are essential to stable power provision, we offer services and systems that combine NAS® battery systems, megawatt-level, high-capacity storage batteries, with renewable energy. We will respond to transformations in power infrastructure as we work to achieve a carbon neutral society.

## Strengths

- Proposal capabilities based on years of infrastructure business knowledge
- Solution provision capabilities incorporating NAS batteries
- Manufacturing technology capabilities for unique, high-quality ceramics

## Major markets

- Power-related industries

## Major customers

- Power companies
- Engineering companies

## Usage examples for NAS batteries

## Electric energy systems for renewable energy



## NAS batteries

The world's first successful commercialization of a megawatt-level electricity storage system. These batteries are unique for being able to provide high-voltage electricity over long periods of time. These systems are used for afternoon peak shaving of electricity charged during the night and as emergency power supplies. NAS batteries are also increasingly being adopted for the output stabilization of wind and solar power generation

systems, which contributes to the dissemination of renewable energy and the construction of smart grids (next-generation electricity distribution networks). We will also provide compatibility for new energy solutions such as demand response, which promotes the effective utilization of stored electricity, and virtual power plants (VPP), which contribute to stable operations for renewable energy.

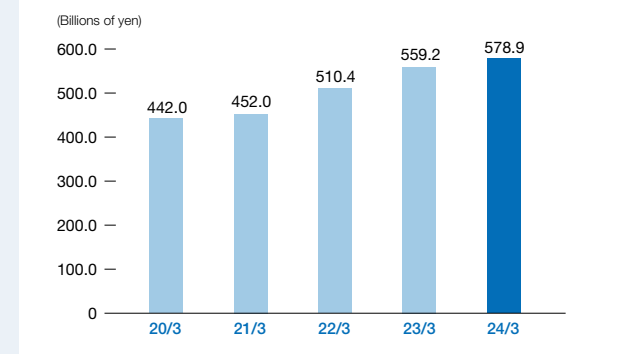


## Financial and Non-Financial Highlights

## Financial Highlights

## Net Sales

578.9 billion yen

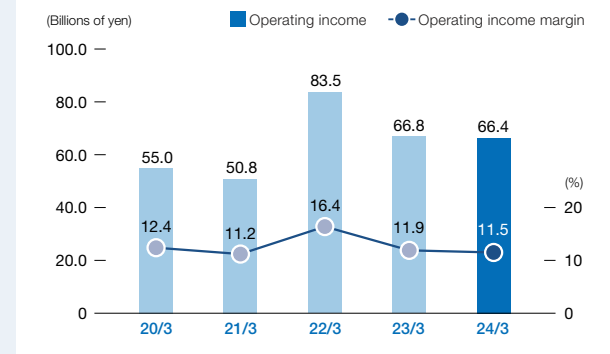


## Operating Income

66.4 billion yen

## Operating Income Margin

11.5%



## Total Assets

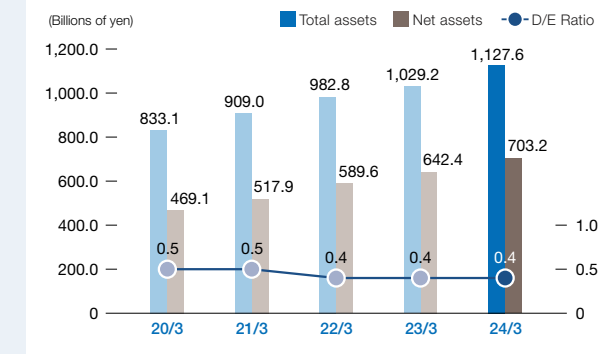
1,127.6 billion yen

## Net Assets

703.2 billion yen

## D/E Ratio

0.4

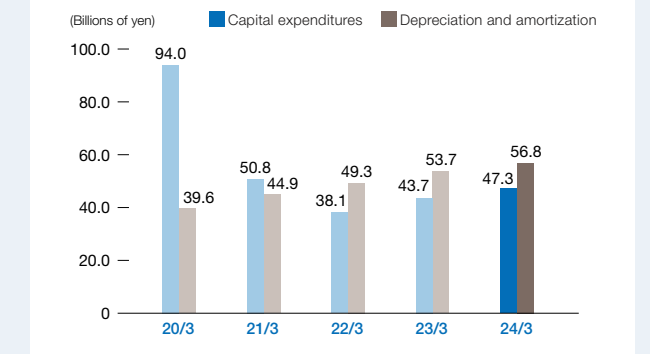


## Capital Expenditures

47.3 billion yen

## Depreciation and Amortization

56.8 billion yen

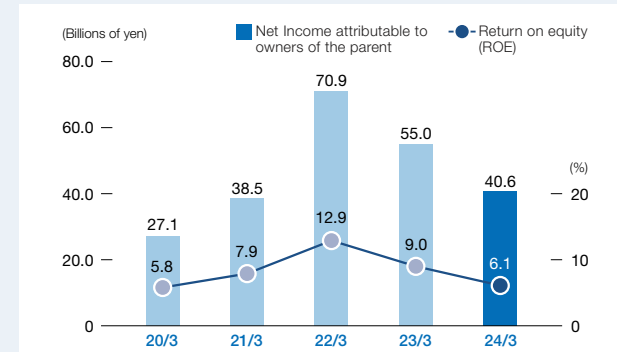


## Net Income Attributable to Owners of the Parent

40.6 billion yen

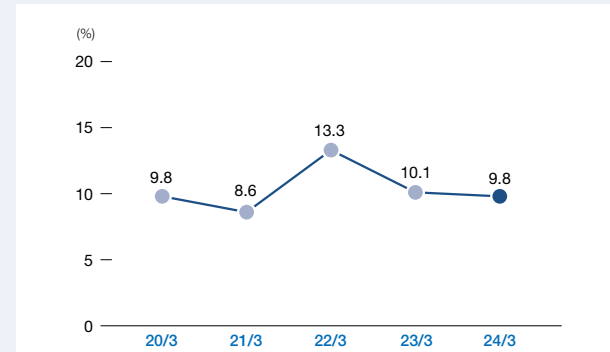
## Return on Equity (ROE)

6.1%



## NGK ROIC (return on invested capital)

9.8%

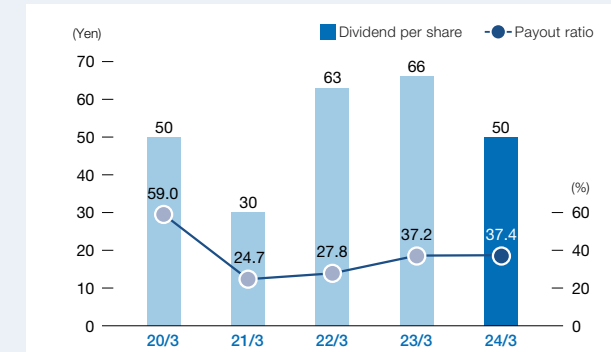


## Dividend per Share

50 yen

## Payout Ratio

37.4%



## Net Cash Provided by Operating Activities

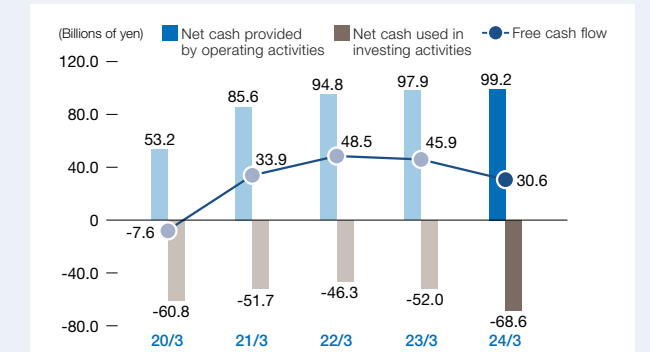
99.2 billion yen

## Net Cash Used in Investing Activities

(68.6) billion yen

## Free Cash Flow

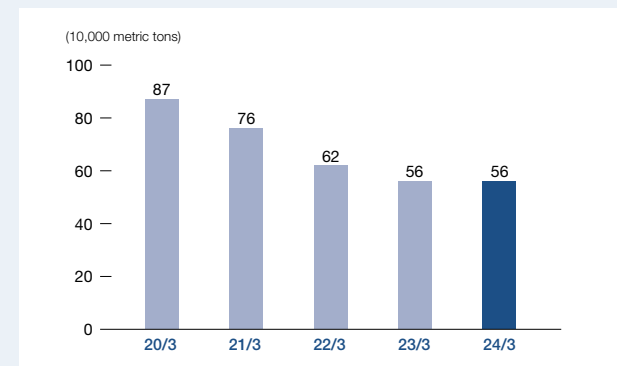
30.6 billion yen



## Non-Financial Highlights

GHG Emissions (Scope 1+2: Energy-origin CO<sub>2</sub>, all NGK Group production sites)

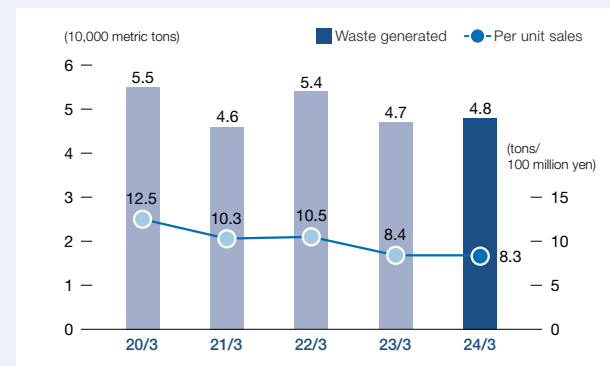
560,000 metric tons



Note: Excludes non-production sites  
Includes offsets from carbon neutral LNG use from FY2021 onward

## Waste Generated (all NGK Group production sites)

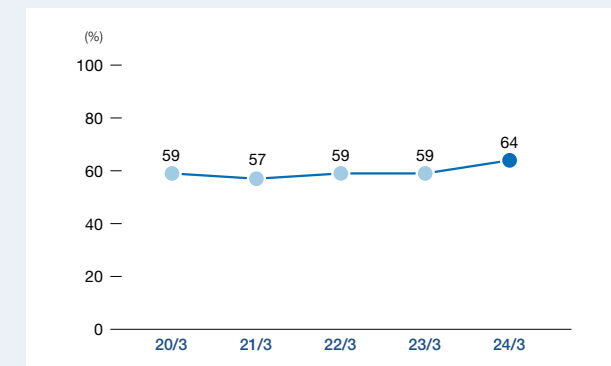
48,000 metric tons



Note: Excludes non-production sites

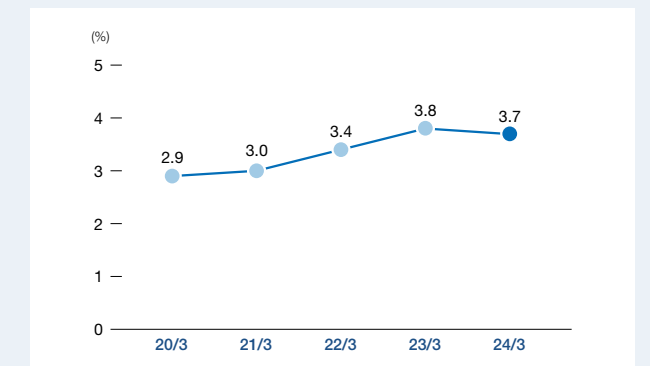
## Sales Rate for Products and Services Contributing to Environmental Protection (NGK Group)

64%



## Rate of Female Key Personnel (Managers) (NGK)

3.7%



## Value Creation Process



**NGK Group Vision: Road to 2050** → P.10

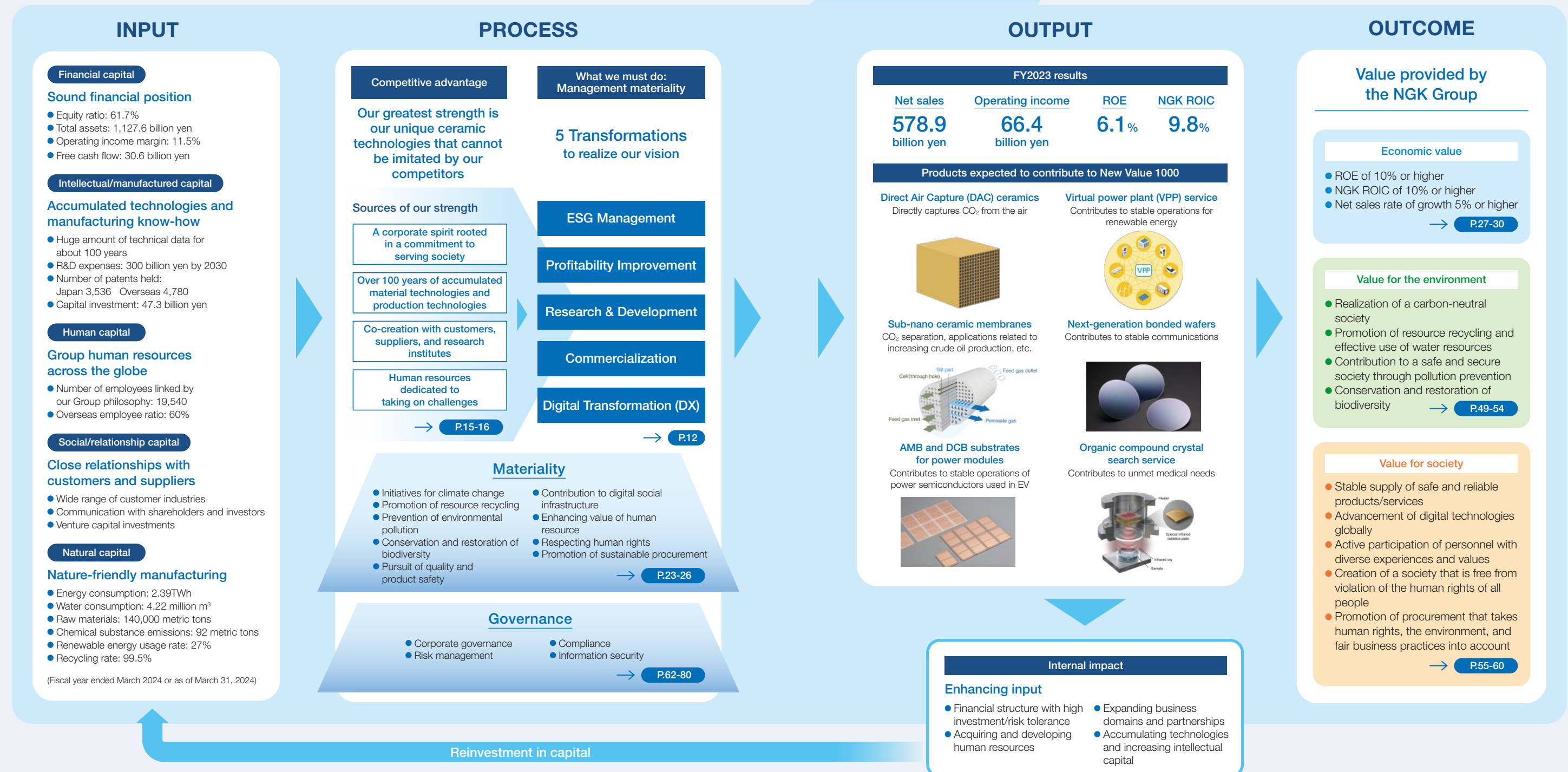
What we want to be: A company to contribute to carbon neutrality and digital society with our unique ceramic technologies

What we must do: Convert our business structure through Five Transformations

FY2050 Target: 80% of sales from CN and DS products

**FY2030 Targets: Net sales from newly launched businesses 100 billion yen** → P.27-30

CN/DS sales ratio: 50%



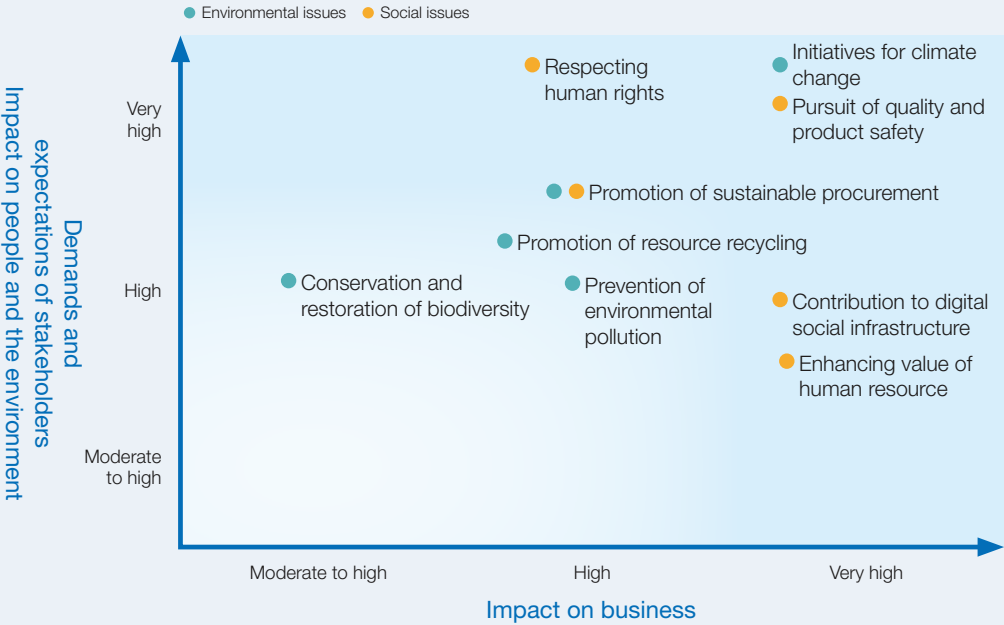
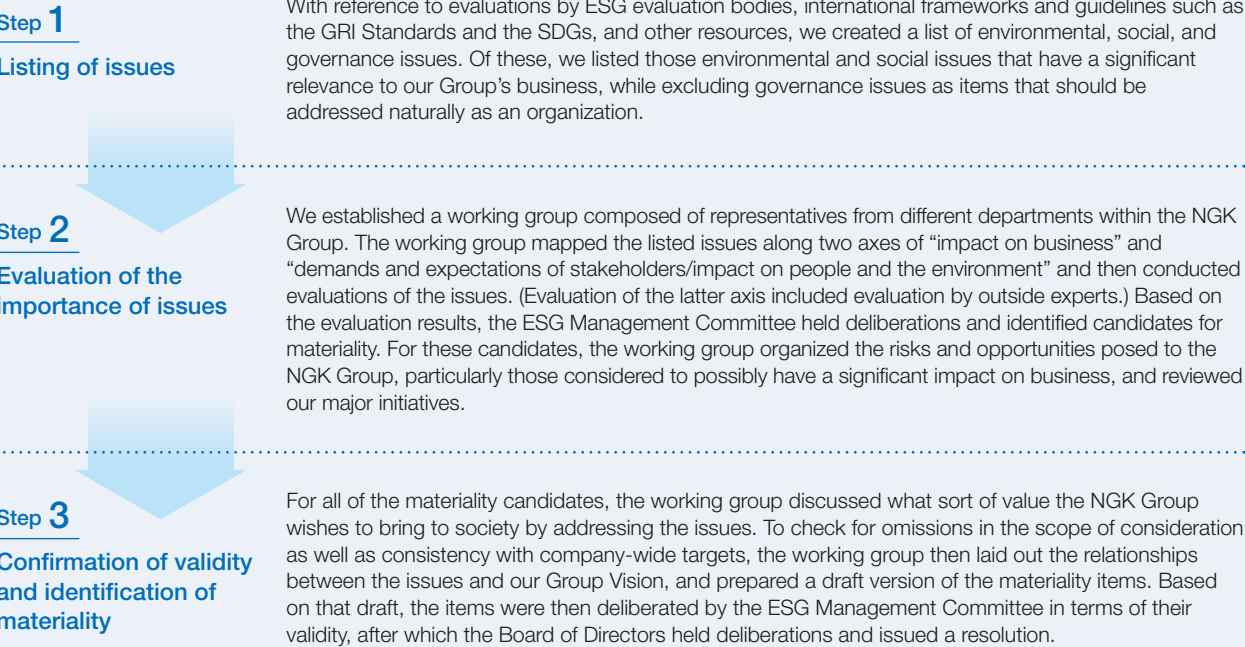


Materiality

As a corporate entity that contributes to the future of energy, protection of the global environment, and development of industries based on its unique ceramic technologies, the NGK Group identifies materiality in order to become a company that we want to be based on the NGK Group Philosophy of Enriching Human Life by Adding New Value to Society.

➤ Materiality Identification Process

Based on the NGK Group Basic Sustainability Policy, the NGK Group identified its materiality in April 2023. We have identified these as issues that are important to both our Group and the stakeholders and as social issues on which our Group should particularly place focus. 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. We believe that doing so will lead to the realization of the NGK Group Vision.



➤ Materiality for Realizing the NGK Group Vision

Phi-losophy	Vision What we want to be	Materiality Items	Value/Impact on Society	Risks
Enriching Human Life by Adding New Value to Society	A company to contribute to carbon neutrality and digital society with our unique ceramic technologies	Initiatives for climate change	We will promote carbon neutrality throughout our value chain and aim for business activities that achieve net zero CO <sub>2</sub> emissions. We will utilize data and digital technology to accelerate the development of products that contribute to the environment. We will develop and offer products and services centered on our unique ceramic technologies to contribute to the realization of a carbon-neutral society by 2050.	<ul style="list-style-type: none"><li>● Shrinking of internal combustion engine-related markets</li><li>● Effects of natural disasters on operations</li><li>● Geopolitical risks</li><li>● Increase in costs due to greenhouse gas reduction and energy conversion</li><li>● Damage to brand reputation</li></ul>
		Promotion of resource recycling	By developing and providing resource-efficient products and services through means including the sustainable use of natural resources, the recycling of wastes, and the utilization of alternative materials, we will contribute to the effective use of resources and to the promotion of resource recycling. Through the development and provision of products and services accompanied by water stress assessments at production sites and by highly efficient water use in production processes, we will also contribute to the effective use of water resources.	<div>Resources<ul style="list-style-type: none"><li>● Depletion of resources; price inflation</li><li>● Geopolitical risks</li><li>● Delays in responses to resource conservation and resource reuse</li></ul></div> <div>Water resource security<ul style="list-style-type: none"><li>● Damage to brand reputation</li><li>● Impacts on operations; increase in costs</li><li>● Water pollution</li></ul></div>
		Prevention of environmental pollution	By developing and providing pollution prevention-related products and services using our unique ceramic technologies while enforcing proper management of chemicals and pollution prevention in our manufacturing processes, we will contribute to a safe and secure society.	<ul style="list-style-type: none"><li>● Compliance</li><li>● Handling of air, water and wastes</li><li>● Handling of chemical substances</li><li>● Impacts on local communities</li><li>● Shrinking of internal combustion engine-related markets</li></ul>
		Conservation and restoration of biodiversity	With all employees maintaining a mindset of environmental conservation, we will contribute to the conservation and restoration of biodiversity through the development and provision of products that contribute to environmental protection while minimizing environmental impacts on the ecosystem in our value chain.	<ul style="list-style-type: none"><li>● Damage to brand reputation</li><li>● Impacts on operations</li><li>● Impacts on supply chains, etc.</li></ul>
		Pursuit of quality and product safety	By pursuing trusted quality from the standpoint of our customers and by stably supplying safe and reliable products and services that exceed expectations, we will contribute to the creation of a better society.	<ul style="list-style-type: none"><li>● Damage to brand reputation</li><li>● Litigation risks</li></ul>
		Contribution to digital social infrastructure	We will establish strong information security to fulfill our duties as a member of a cultured and safe digital society. At the same time, we will supply products based on our unique ceramic technologies to make continuous contributions to global digital technology.	<ul style="list-style-type: none"><li>● Damage to brand reputation</li><li>● Cyber attacks</li><li>● Information leaks</li><li>● Increase in the cost of security enhancement</li></ul>
		Enhancing value of human resource	We will create prosperous and energetic workplace environments that take advantage of human resources with diverse experiences and perspectives. We will offer society new value by encouraging each employee to proactively take on challenges and promoting mutual growth.	<ul style="list-style-type: none"><li>● Compliance</li><li>● Damage to brand reputation</li><li>● Declining competitiveness of recruitment and outflow of personnel</li><li>● Human resource development</li><li>● Rigidity of internal systems</li></ul>
		Respecting human rights	We are committed to create a society that is free from violation of the human rights of all people impacted by our business activities by extending initiatives throughout the NGK Group as well as our value chain to respect human rights.	<ul style="list-style-type: none"><li>● Damage to brand reputation</li><li>● Impacts on business partners</li><li>● Operational and litigation risks</li><li>● Increase in costs and liabilities</li><li>● Recruitment and human resources</li><li>● Latent human rights risks and its actualization</li></ul>
		Promotion of sustainable procurement	Based on the three principles of Open and Fair, Partnership, and Relationship with Society in our basic procurement policy, we work with procurement partners that make up the supply chain to promote procurement that takes human rights, the environment, and fair business practices into account, thereby fulfilling our supply responsibilities and contributing to the happiness and sustainable development of society.	<div>Environment<ul style="list-style-type: none"><li>● Impacts on procurement due to increased environmental impact in the supply chain</li><li>● Increase in costs due to measures to reduce CO<sub>2</sub> emissions, etc.</li><li>● Demands from markets regarding waste and recycling</li><li>● Depletion of raw materials and rare metals</li></ul></div> <div>Society<ul style="list-style-type: none"><li>● Damage to our brand reputation</li><li>● Impacts on our business partners</li><li>● Impacts on procurement</li></ul></div>

Phi- losophy	Vision What we want to be	Materiality Items	Opportunities	Vision What we must do	Correlation to 5 Transformations						Action Plans	KPIs	Targets	Target Achievement Periods
					ESG Management	Profitability Improvement	commer- cialization	R&D	DX					
Enriching Human Life by Adding New Value to Society	A company to contribute to carbon neutrality and digital society with our unique ceramic technologies	Initiatives for climate change	<ul style="list-style-type: none"><li>Expansion of CN-related business opportunities</li><li>Reduction of costs</li><li>Enhancement of our brand reputation</li></ul>	Convert our business structure through 5 Transformations	●	●	●	●	●		[NV1000] Development of carbon neutral-related products  [Environmental Vision] Implement Carbon Neutrality Strategic Roadmap	Sales of newly commercialized products  CO <sub>2</sub> emissions CO <sub>2</sub> emission reduction rate relative to base year Renewable electricity procurement rate Energy saving rate	100 billion yen (including digital society-related sales)  550,000 tons 25% 50% 2%/year	FY2030  End of FY2025 End of FY2025 End of each FY
		Promotion of resource recycling	Resources <ul style="list-style-type: none"><li>Expansion of business opportunities related to resource recycling</li><li>Expansion of business opportunities associated with the depletion of rare metals, etc.</li><li>Utilization of ceramic raw materials</li><li>Reduction of costs</li></ul> Water resource security <ul style="list-style-type: none"><li>Enhancement of brand reputation</li><li>Expansion of business opportunities for water treatment-related products (membranes, etc.)</li></ul>		●	●	●	●	●		[Environmental Vision] Respond to circular society (respond to circular economy)	Emissions generated per unit of sales Reduction rate of emissions compared to Business as usual (BAU) Recycling rate (domestic)	50% reduction compared to FY2013 30% reduction compared to FY2013  Maintain 99% or higher	End of FY2025 End of FY2025  End of FY2025
		Prevention of environmental pollution	<ul style="list-style-type: none"><li>Expansion of exhaust gas-related business</li><li>Expansion of air and water quality-related business</li><li>Expansion of nuclear power-related waste treatment business</li></ul>		●		●	●			Zero legal non-compliance issues · Education and confirmation of understanding  · Enhance the database of registered facilities  Zero serious accidents · Prevention activities (reassess equipment management issues) · Real-time status monitoring	Number of training participants  Number of incomplete notifications  Number of departments/bases currently promoting activities Number of status monitoring points	Completed by all eligible participants (approximately 1,000 people) 0 cases of incomplete notifications  All locations (33 independent, 19 domestic G companies, 20 overseas G companies) Sites (non-consolidated: 4)	End of FY2024 End of FY2025  End of FY2024 End of FY2025
		Conservation and restoration of biodiversity	<ul style="list-style-type: none"><li>Enhancement of our brand reputation</li><li>Expansion of businesses and products with consideration of ecosystems</li></ul>		●		●				[Environmental Vision] Harmony with nature	TNFD disclosure schedule (TNFD: Task Force on Nature-Related Financial Disclosures)	Disclosure based on TNFD Framework	End of Sept. 2024
		Pursuit of quality and product safety	<ul style="list-style-type: none"><li>Enhancement of our brand reputation</li><li>Enhancement of competitiveness</li><li>Expansion of business opportunities</li></ul>		●	●					Activities to increase customer trust · Improve work quality · Reduce quality risks	Number of serious product/service incidents	0 cases	End of each FY
		Contribution to digital social infrastructure	<ul style="list-style-type: none"><li>Expansion of DS-related business opportunities</li><li>Enhancement of our brand reputation</li></ul>		●	●	●	●	●		[NV1000] Develop digital society-related products, expand existing related products  [Digital Vision] IT security Personal information protection activities	Sales of newly commercialized products  Number of serious incidents Number of serious incidents	100 billion yen (including carbon neutral-related)  0 cases 0 cases	FY2023  End of each FY End of each FY
		Enhancing value of human resource	<ul style="list-style-type: none"><li>Recruitment and retention of personnel</li><li>Active participation of diverse personnel by DE&amp;I promotion</li><li>Growth through human resource development</li><li>Productivity enhancement</li></ul>		●	●	●	●	●		Initiatives for reducing total working hours: Promote paid leave utilization (zero cuts to annual leave) Improving the rate of female managers Permeate and encourage men to take childcare leave, etc. Create a culture of utilizing diversity, including systems Develop DX human resources Improve employee engagement  Zero legal non-compliance · Education and confirmation of understanding  · Enhancement of facility notification database  Zero serious accidents · Prevention activities · Activities to promote proactive mentality  Enhancing mental health care (self-care/line care)	Score of the survey on workplace vitality Paid leave utilization rate Rate of female managers Rate of male employees taking childcare leave Score of the survey on workplace vitality Number of data utilization personnel Score of the survey on workplace vitality  Number of training participants  Number of incomplete notifications  Disaster severity level Number of workplace discussions  Rate of participation in mental care education by position	3.5 or higher 100% 10% 100% 3.5 or higher 1,000 or more 3.5 or higher  Completed by all eligible participants (approximately 1,000 people) 0 cases of incomplete notifications  Intensity rate 0.01 or lower All manufacturing divisions (9 non-consolidated, 21 domestic G companies) 100%	Each FY End of FY2026 End of FY2030 End of FY2025 Each FY End of FY2030 Each FY  End of FY2024 End of FY2026  End of FY2024 End of FY2024  End of each FY
		Respecting human rights	<ul style="list-style-type: none"><li>Enhancement of brand reputation</li><li>Recruitment and retention of personnel</li></ul>		●						Conduct dialogue with internal and external stakeholders  Conduct self-checks for NGK and Group companies  Expand employees applicable for human rights education, update content	Frequency of conducting two-way exchanges of opinions with internal and external stakeholders  Frequency of self-checks in compliance with RBA and other codes of conduct Frequency of human rights e-learning for executives and all employees	Conduct each year  Conduct each year Conduct each year	End of each FY  End of each FY End of each FY
		Promotion of sustainable procurement	Environment <ul style="list-style-type: none"><li>Enhancement of our brand reputation</li><li>Securing of stable procurement and reduction of costs through the utilization of alternative raw materials</li></ul> Society <ul style="list-style-type: none"><li>Enhancement of our brand reputation</li><li>Building of a stable supply chain</li></ul>		●						Sharing the Supplier Code of Conduct Supplier assessment activities  Scope 3 reduction activities	Rate of consent among major suppliers Frequency of sustainability surveys for key suppliers  Scope 3 emissions reduction rate (compared to 2022)	90% or higher Every other year  25%	End of FY2025 Start of FY2025 (based on new survey method) FY2030



## Message from our Director in Charge of Finance and ESG



### Enhancing dialogue with capital markets and pursuing financial and non-financial management that leads to value creation.

Director and Senior Vice President  
Hideaki Shindo

Enhance capital profitability by increasing the earnings of existing businesses and returning profits to shareholders.  
Ensure growth potential by actively investing in high value-added products and new products.  
Upgrade non-financial value by working to resolve ESG material issues.  
We will advance these three initiatives to improving our enterprise value.

## FY2023 results and FY2024 outlook

FY2023 resulted in net sales of 578.9 billion yen. Boosted by significant yen depreciation, this represents a record high for net sales. However, while the Environment Business recorded favorable sales on the increase in vehicle sales, the Digital Society Business recorded decreased net sales and profit on the impact of a downturn in the semiconductor market. Operating income was 66.4 billion yen, and net income was 40.6 billion yen, resulting in a decrease in profits.

For FY2024, we are targeting increased both sales and income of 620 billion yen in net sales, 75.0 billion yen in operating income, and 53.0 billion yen in net income for the entire company. While market conditions for the Digital Society Business remain difficult, the semiconductor market is projected to recover from the

second half of the fiscal year onward. Also, the Energy & Industry Business is projected to see an increase in shipments of NAS batteries for overseas projects. Overall, we project being able to grow both sales and profit.

## Aiming to improve enterprise value

As of the end of FY2023, stock markets evaluated NGK as having a price-to-book ratio (PBR) of less than 1x but we are striving to make rapid improvement. NGK positions sustainable increases in enterprise value and profit returns to shareholders are core management issues, and we are promoting three initiatives to enhance capital profitability, ensure growth potential, and upgrade non-financial value.

## ● Enhance capital profitability

For capital profitability, we assume capital costs of approximately 9% based on the capital asset pricing model (CAPM). We also set a target return on equity (ROE) of 10% or higher, which would exceed capital costs. To achieve these targets, we adopted an NGK-specific formula for return on invested capital (ROIC: operating income / business assets (accounts receivable + inventory assets + non-current assets)) as an internal management metric. Closely related to ROE, we use this metric to evaluate capital profitability for each business.

Looking at each segment, while the Environment Business, our core business, is projected to see a decline in growth potential due to developments related to the shift to vehicle electrification, we will aim to improve profitability by reducing costs and negotiating prices with customers. From FY2024, we transferred Industrial Processes from the Energy & Industry Business to the Environment Business. We will accelerate the development and validation testing for new products by combining the engineering functions of Industrial Processes with the manufacturing technology used to produce ceramic substrates for automotive catalytic converters and filters.

For the Digital Society Business, we will further expand industry share by developing new products and increasing the added value of existing products. This is a sector with extremely high growth potential, so we will input management resources, including aggressively engaging in development, capital investments and, when

appropriate, M&A deals to increase profitability.

With the Energy & Industry Business, we have seen an improvement in profitability thanks to expanding growth potential through large-scale NAS battery projects while also continuing with ongoing initiatives of insulators. Moving forward, I hope to further accelerate these efforts.

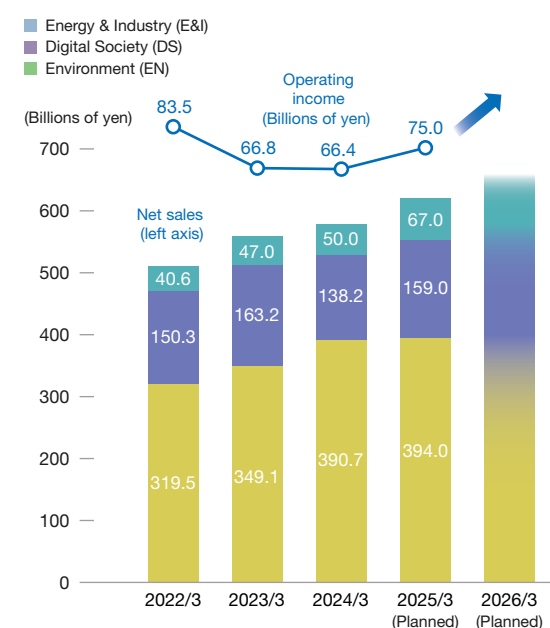
Thanks to efforts in each business, we project the NGK ROIC to improve from 9.8% in FY2023 to 11.0% in FY2024. An awareness of the importance of the NGK ROIC has permeated the entire company and I feel that each business headquarters is constantly pursuing business management focused on asset performance.

## ● Ensure growth potential

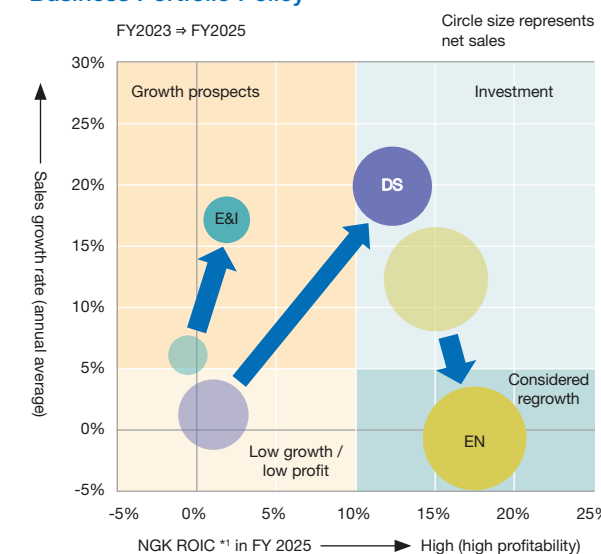
Ensuring growth potential is a core element of our management strategy. In addition to portfolio management to ensure the appropriate distribution of management resources, we are also strengthening R&D to promote sustainable growth. These initiatives are embodied by NV1000, our target of achieving at least 100 billion yen in net sales from new products by FY2030.

For existing businesses and newly commercialized products, we are pursuing business portfolio management based on two core themes: profitability and growth. We carefully examined our targets of achieving an NGK ROIC of 10% and a sales growth rate of 5%. We will prioritize investments in businesses projected to see growth and will evaluate the viability of businesses in low-growth and low-profit sectors. In FY2024, we are planning to make a total of 68 billion yen in capital investments, mainly to

## Progress Relative to the NGK Group Vision (performance trends)



## Business Portfolio Policy



\*1 NGK ROIC = Operating income ÷ Business assets  
(Accounts receivable + Inventories + Fixed assets)  
Instead of "capital" and "liabilities," this is calculated based on business assets (accounts receivable, inventories, fixed assets) that can be managed by business divisions

make upgrades in the Environment Business and increase production in the Digital Society Business, which is expected to see future growth.

In the area of new business expansion, we are making steady progress towards NV1000, and we are aiming for sales of roughly 20 billion yen in FY2030 for AMB and DCB substrates for power modules, products we have already commercialized. For products in the validation phase that are close to commercialization, we will aim for the rapid commercialization of direct air capture (DAC) ceramics and sub-nanoceramic membranes. In total, we will aim for sales of roughly 100 billion yen. We also have themes in the development phase projected to generate nearly 100 billion yen in total. As with the previous year, in FY2024 we plan to invest more than 30 billion yen in R&D, mainly in the carbon neutrality and digital society sectors.

● Upgrade non-financial value

Upgrading non-financial value, value that is not reflected in financial indicators, is also important to improving our enterprise value. The NGK Group positions Environment, Society, and Governance (ESG) as central to our management as we strive to achieve sustainable growth and transform our business structure to reflect the NGK Group Vision. I believe these activities are essential for long-term growth.

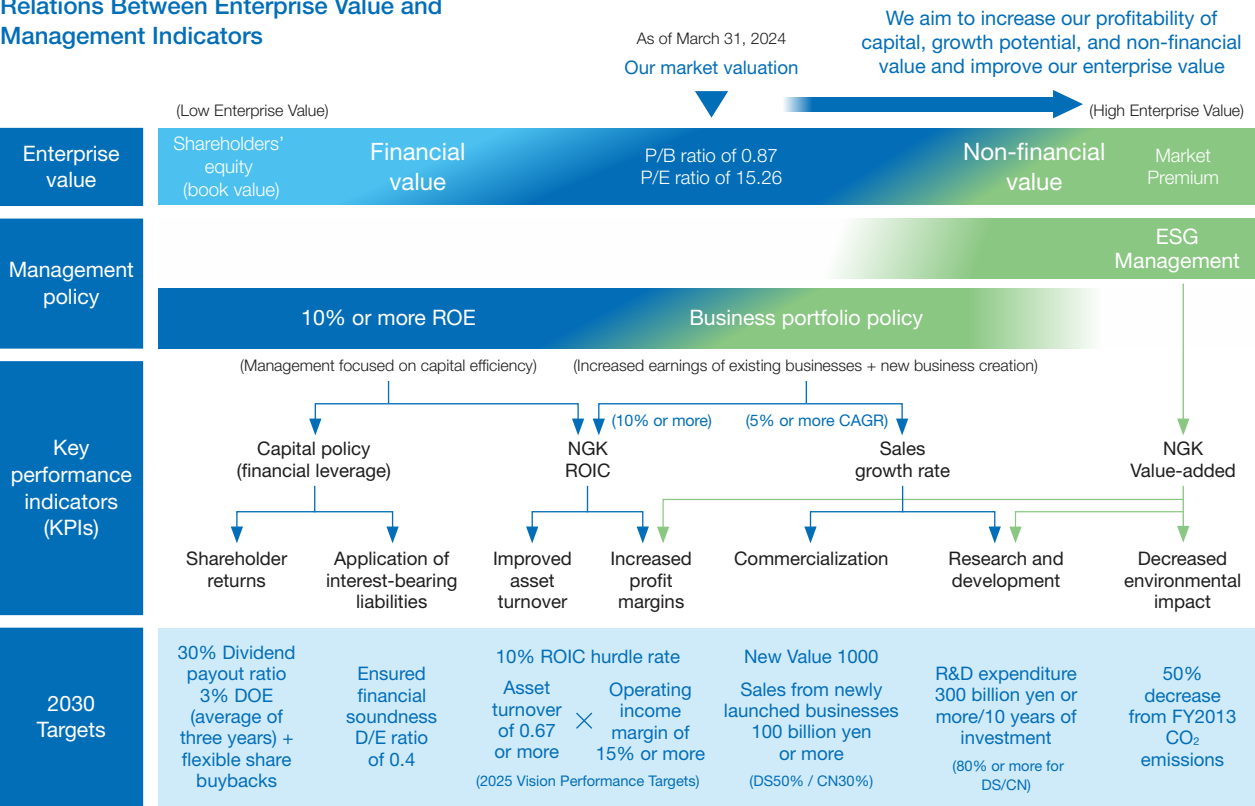
In April 2023, we identified nine materialities for the NGK Group. These materialities work to support our basic sustainability policy, and we recognize that resolving these issues will lead to growth as a Company. The ESG Management Committee deliberated on the KPI to serve as targets for each materiality, and the Board of Directors approved these. As such, we will steadily engage in management based on these materialities and KPI.

As part of ESG management, in addition to considering our social responsibility, we will also invest in human capital and intellectual capital, which we view as sources of future growth. As management metrics, we have adopted NGK Value-added. In addition to operating profit, NGK Value-added takes into account CO<sub>2</sub> emission costs, labor costs, R&D costs, and our achievement rate for the ESG targets of each rating agency. These targets and metrics will help clarify relevant issues related to increasing sustainability and non-financial value. Improvements in these areas will lead to improved quality as a company. We believe it is important to grow profit by achieving a good balance between input towards increasing current profitability and input towards upgrading non-financial value that leads to future performance.

● Maintaining a sound financial platform

As for our capital policy, we are focused on achieving

Relations Between Enterprise Value and Management Indicators



Input towards increasing current  
profitability and input towards upgrading  
non-financial value that leads to future performance.  
Balancing these two to achieve profit growth.

both profitability that exceeds the cost of capital and financial soundness. We will work to maintain profit margins, capital turnover, and financial leverage at healthy levels that are consistent with our business strategy. In addition to reducing capital costs by actively returning profits to shareholders, including the use of interest-bearing debt and flexible share buybacks, we will aim to improve ROE and expand our equity spread by securing growth potential. With financing, our basic policy will be to use interest-bearing debt if we exceed free cash flow while ensuring financial soundness by aiming for a D/E ratio of 0.4. While maintaining our bond rating of A+, we will work to improve our rating by increasing our earning potential and cash flow.

● Valuing dialogue with investors and shareholders

The NGK Group places importance on the interests of our shareholders and positions the sustainable improvement to our enterprise value and profit returns as our most important management policies. We will maintain a good balance between securing appropriate investment capital for growth and returning profits with a focus on capital efficiency.

As a dividend policy, our medium to long-term goal is to maintain a dividend to net assets ratio of 3% and a consolidated dividend payout ratio of approximately 30%. At the same time, we will pursue net asset management that reflects changes in our business risks

and the link to ROE over a period of approximately three years. We will also consider cash flow forecasts and other factors when making allocations. For FY2023, we are planning to issue shareholder dividends of 50 yen per share, and planning on 60 yen per share for FY2024.

We also are proceeding with share buybacks towards improving capital efficiency and enhancing shareholder returns. In FY2023, we acquired 8.5 million shares (14.9 billion yen). We will continue to flexibly implement investments while comprehensively considering factors such as growth investments, dividend levels, cash on hand and stock price levels.

We are also actively promoting dialogue with investors and shareholders. In addition to financial results briefings for investors (twice a year), we also held forums for overseas investors led by our lead securities firm, conducted overseas IR, and conducted IR activities for individual investors. Last fiscal year, we also held SR meetings for shareholders. During these activities, I could sense that investors had a strong interest in our business status, future growth, and human resources.

We will use the feedback obtained through such dialogue to improve the quality of our management. We will also strive to further enhance information disclosure towards promoting a better understanding of the NGK Group's medium to long-term outlook and management style.

We look forward to your continued support as we continue our efforts to further improve our enterprise value.



# New Value 1000

Realizing Our Vision,  
Challenging Ourselves to  
Sustainable Growth

New Value 1000 (NV1000), the target for 2030 set as a milestone on our way to realizing the NGK Group Vision, Road to 2050. The NGK Group will promote a united effort towards achieving this target and link these efforts to sustainable growth. In this section, we introduce the initiatives the NGK Group will implement as we boldly challenge ourselves in various fields, including our results thus far and promising themes for the future.

## NV1000 Overview and Progress

The NGK Group Vision, Road to 2050, sets New Value 1000 (NV1000) as a core policy for transforming our business structure. NV1000 is the goal of achieving 100 billion yen in net sales from new business products in 2030. To ensure we achieve NV1000, we strengthened marketing functions by tapping an unprecedented number of human resources to establish Corporate NV Creation. This group is collaborated with Corporate R&D and Corporate Manufacturing Engineering to accelerate the speed of commercialization for development themes. In April 2024, we established CN Business Creation Div. as a group within the Environment Business Group to accelerate the commercialization of new products targeting the CN domain. Thus far, we successfully commercialized AMB and DCB substrates for power modules and an organic compound crystal search service. Moving forward, we will aim to achieve NV1000 by commercializing products in the demonstration and development phases, which represent expected sales on the scope of 200 billion yen.

### Products in the development phase: About 100 billion yen

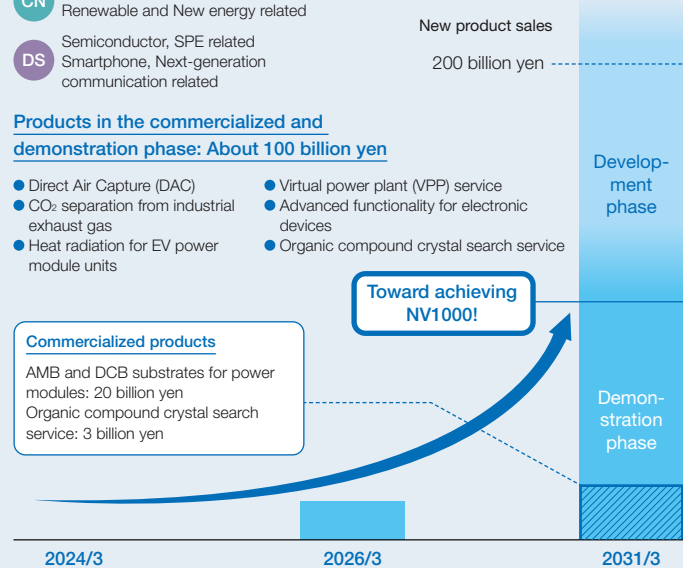
- CN** Hydrogen, Methanation related  
Renewable and New energy related
- DS** Semiconductor, SPE related  
Smartphone, Next-generation  
communication related

### Products in the commercialized and demonstration phase: About 100 billion yen

- Direct Air Capture (DAC)
- CO<sub>2</sub> separation from industrial exhaust gas
- Heat radiation for EV power module units
- Virtual power plant (VPP) service
- Advanced functionality for electronic devices
- Organic compound crystal search service

### Commercialized products

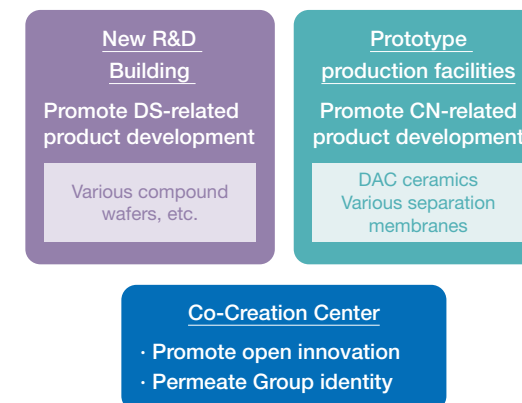
- AMB and DCB substrates for power modules: 20 billion yen
- Organic compound crystal search service: 3 billion yen



## To Accelerate NV1000

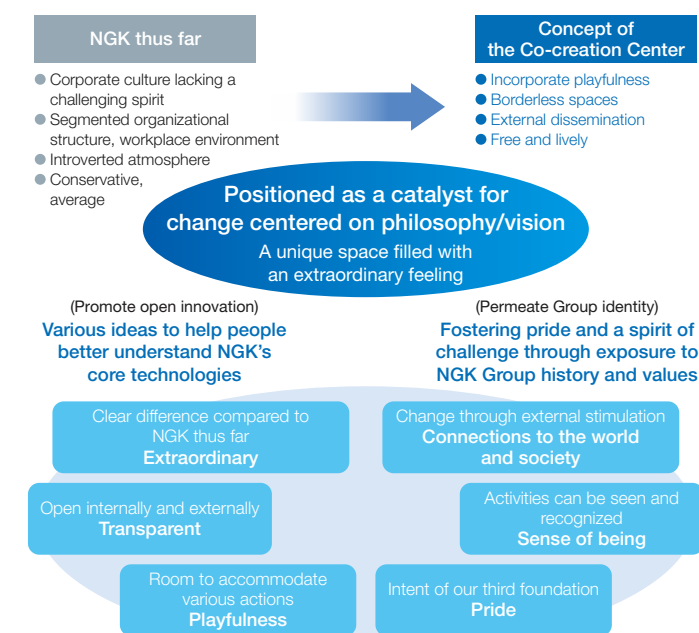
### Continue High-level R&D Investments

To achieve NV1000, the NGK Group is planning to conduct R&D investments totaling 300 billion yen over the 10-year period from FY2021. We are also enhancing the new product development site at our main office to accelerate our business structure transformation. This includes constructing a new R&D building for digital society (DS)-related products scheduled to be completed in FY2025, installing prototype production facilities in the carbon neutrality (CN)-related product development area, and establishing a Co-Creation Center (tentative name) that will serve as a place for internal/external co-creation. While continuing to implement high-level R&D investments, we will also aim for the rapid commercialization of development themes. We will assess the status of markets and development progress to dynamically provide various input for promising themes.



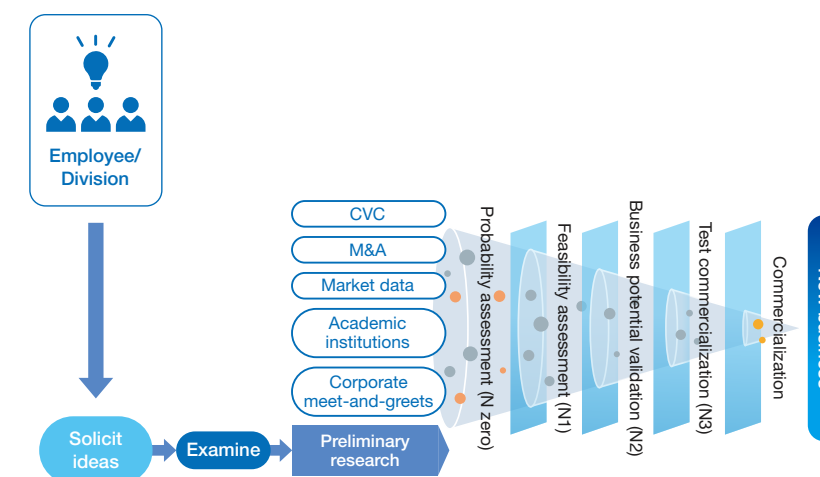
### Promote Open Innovation

In November 2023, we announced the construction of a new Co-Creation Center that will serve as a base for using ceramic technologies to offer new value to society, which is a part of our Corporate Philosophy. Through this Center, we will promote the open innovation necessary to create various new value and expand collaborations with external partners. The Co-Creation Center will also function as a place for promoting our Group identity as we work to cultivate a culture that encourages employees to take on new challenges. With this in mind, we created an area for introducing our products and core technology contributing to resolving social issues, an area for ideation with people outside the company, and an area to creating encounters and exchanges both inside and outside the company. This will be an environment that promotes the fusion of various internal and external skills, knowledge, and experience. At this Center, we will promote co-creation and aim to quickly and efficiently create new products and new businesses. Completion is scheduled for May 2025.



### Framework for Incorporating Employee Opinions and Ideas

To promote the creation of new themes, in FY2024 we launched a New Business Proposal Program to gather ideas from employees and departments. The objective of this program is to solicit a wide range of ideas from within the company, increase the possibility of creating new businesses, and provide employees with opportunities to take on new business challenges. We have prepared a variety of support systems for new business ideas, including a secretariat that will support the process from idea creation to proposal to in-depth research. Initially, this program will only apply to NGK. However, in the future, we will accelerate the creation of new businesses by expanding this program to the entire NGK Group.

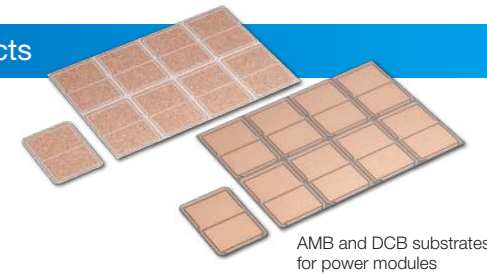
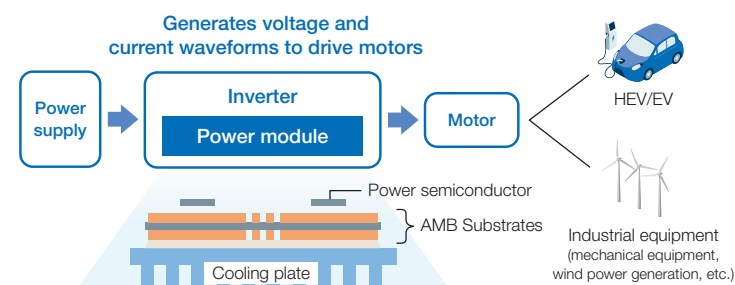




## Initiatives for Achieving NV1000: Commercialized Products

## ➤ AMB and DCB Substrates for Power Modules

These AMB and DCB substrates for power modules are products used in the power semiconductor modules that control power conversion in motor drive controllers and power generators. AMB and DCB substrates for power modules fulfill the role of stabilizing motor operations by releasing heat generated when the power semiconductor is operating. AMB substrates for power semiconductor modules made of silicon nitride ( $\text{Si}_3\text{N}_4$ ) are used in inverters for controlling the motors of electric vehicles (EVs) and hybrid vehicles (HEVs). These substrates are required to operate stably even in high-temperature environments involving the use of large amounts of power, and are increasingly being adopted for power semiconductors made of silicon carbide (SiC). Our silicon nitride AMB substrates for power semiconductor modules achieve high reliability and excellent heat dissipation characteristics thanks to our proprietary bonding technology. These products have been adopted by several power semiconductor manufacturers in Europe and Japan since 2019 as a product that maximizes the performance of power semiconductors. With the global vehicle electrification, demand for automotive electronic applications is growing, and the market is expected to experience further medium and long-term growth. The NGK Group will aim for net sales of 20 billion yen in FY2030 by expanding current monthly production by 2.5 times by FY2026 to ensure we capture future demand in this growth market.



## Needs of power semiconductor market

- Social demand for reducing environmental impact
- Requirements for energy saving and miniaturization of power control devices

## Issues related to resolving needs

- By promoting energy saving and miniaturization of power semiconductors, heat is generated when driving the power semiconductor, making the drive unstable

## Research and development to resolve issues

- Ensuring stable drive through the development of unique heat dissipation technology, achieves high reliability

## Implementation in society: commercialization

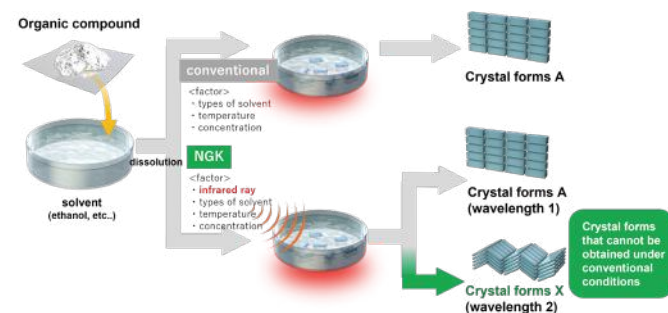
- Highly reliable AMB and DCB substrates for power modules used by several power semiconductor manufacturers in Europe and Japan since 2019

Target  
FY2030 net sales  
**20 billion yen**

World's  
First!

## ➤ Organic Compound Crystal Search Service Business

In April 2024, we launched the world's first organic compound crystal search service based on our proprietary infrared technology. Even pharmaceuticals with the same compound may have different structures when crystallized, and differences in structure impact efficacy and safety. The purpose of this service is to enable searches for a wide variety of crystal forms. The most distinctive feature of this service is that it incorporates infrared rays as a new approach compared to conventional search methods. This contributes to drug development by increasing the potential for discovering unknown crystal forms, which can be difficult to discover using conventional methods. We are also developing our own crystal prediction software using artificial intelligence (AI), which is scheduled to be available in FY2025. Through this service, we aim for net sales of 3 billion yen in FY2030.



Target  
FY2030 net sales  
**3 billion yen**

## KEY PERSON

Setting development themes on a trajectory

SN ( $\text{Si}_3\text{N}_4$ \*) AMB substrates for power semiconductor modules contribute to stable operations for the power semiconductors used in EVs. These are a future growth product developed using advanced technology unique to the NGK Group. We are aiming for sales of roughly 20 billion yen in FY2030, and will pursue further business development as we work towards achieving NV1000 and realizing the NGK Group Vision.

\* $\text{Si}_3\text{N}_4$  (SN, silicon nitride)

The NGK Group AMB and DCB substrates business started in 2015 when our Group company, NGK ELECTRONICS DEVICES, INC., launched a business for aluminum-based DCB substrates for power modules. At that time, we focused on a new technology called silicon nitride. With the advancement of EVs, we predicted that demand for silicon nitride-based substrates for power semiconductor modules in electric vehicles was certain to increase in the future. Based on this projection, the New Business Planning Dept., (the predecessor of Corporate NV Creation) took the lead in developing an SN AMB substrates for power semiconductor modules.

In the past, NGK conducted product development driven by technology. The AMB and DCB substrates business represents an example of NGK creating a theme based on a market-oriented approach and then working towards new business creation from the onset. The New Business Planning Department coordinated operations, acting as a command center to supervise the entire process. The department actively was collecting information on silicon nitride, collaborating with other companies and research institutes such as universities. The department also promoted the incorporation and repurposing of existing technologies by strengthening collaborations between various internal departments. Various proprietary technology of the NGK Group was incorporated. For example, know-how from New Metals Div. was applied towards copper layering technology and technology from the New

Metals Div. and High Performance Ceramics Dept. were utilized for bonding. We also sent human resources to Europe, our main target market, from an early stage with the intent of pursuing future market expansion. We took the initiative to approach auto parts manufacturers and gain market share. We received a positive response from customers thanks to our strengths in the global production of auto parts and a proven track record in the market. Under the motto of capturing half of global share, we smoothly advanced the development of our sales network. In this way, the engineering side and the sales side worked towards a common direction while simultaneously fulfilling their respective roles. This enabled us to accelerate product development and build a social implementation system. This method is being fully adopted by Corporate NV Creation, which is in charge of our NV1000 strategy. This approach is becoming firmly established as a new business format for the NGK Group.

In the future, we will achieve NV1000 by expanding our market share through a focus on distinguishing ourselves from the competition for our technical capabilities. We will also work to stabilize our supply capabilities. R&D and marketing will work together to develop this business and lead the way towards achieving this goal. There are numerous possibilities for the ceramic business in the field of power semiconductors. We will take on the challenge of developing products that will support the future of power electronics, starting with the AMB and DCB substrates business.

## AMB and DCB substrates for power modules to fulfill role towards achieving NV1000.

Vice President  
Group Vice President, Digital Society Business Group  
General Manager, Power Electronics Ceramics Dept.,  
Digital Society Business Group  
President, NGK ELECTRONICS DEVICES, INC.

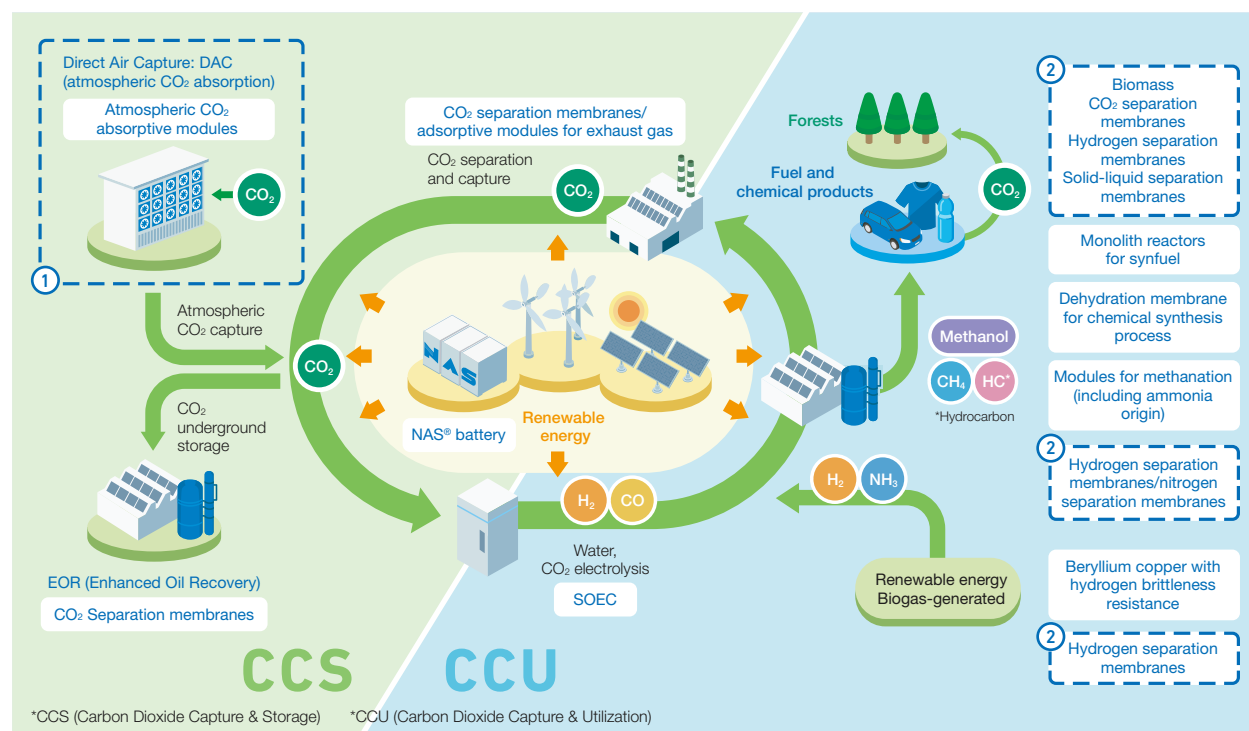
Hideki Shimizu





## Initiatives for Achieving NV1000: Demonstration Phase Products

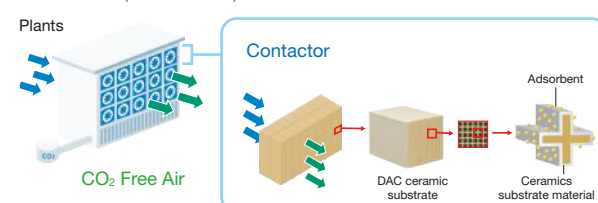
## CN Realizing carbon neutrality through the capture, storage, and utilization of CO<sub>2</sub>



### ① Direct Air Capture (DAC) ceramics

New technology such as methanation and DAC is garnering attention around the world as methods for realizing a carbon-neutral society. The NGK Group is challenging itself in the field of DAC, a technology for directly adsorbing and recovering CO<sub>2</sub> in the atmosphere. We are applying the ceramic honeycomb structure technology cultivated through ceramics for automotive exhaust gas purification. NGK is developing DAC with features such as being compact and having a large surface area, and being able to efficiently process large amounts of air. It is estimated that approximately 1 billion tons of CO<sub>2</sub> will be treated with DAC ceramics in 2050. The NGK Group is converting production equipment for automotive exhaust gas purification ceramics. By 2025, we will collaborate with other companies to participate in demonstration tests with the goal of establishing a mass production system by around 2030.

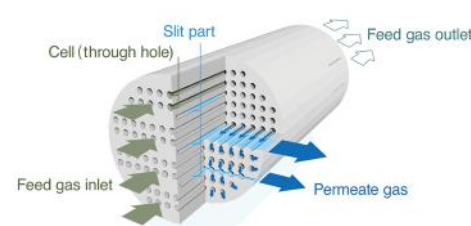
Ambient Air (CO<sub>2</sub> = 0.04%)



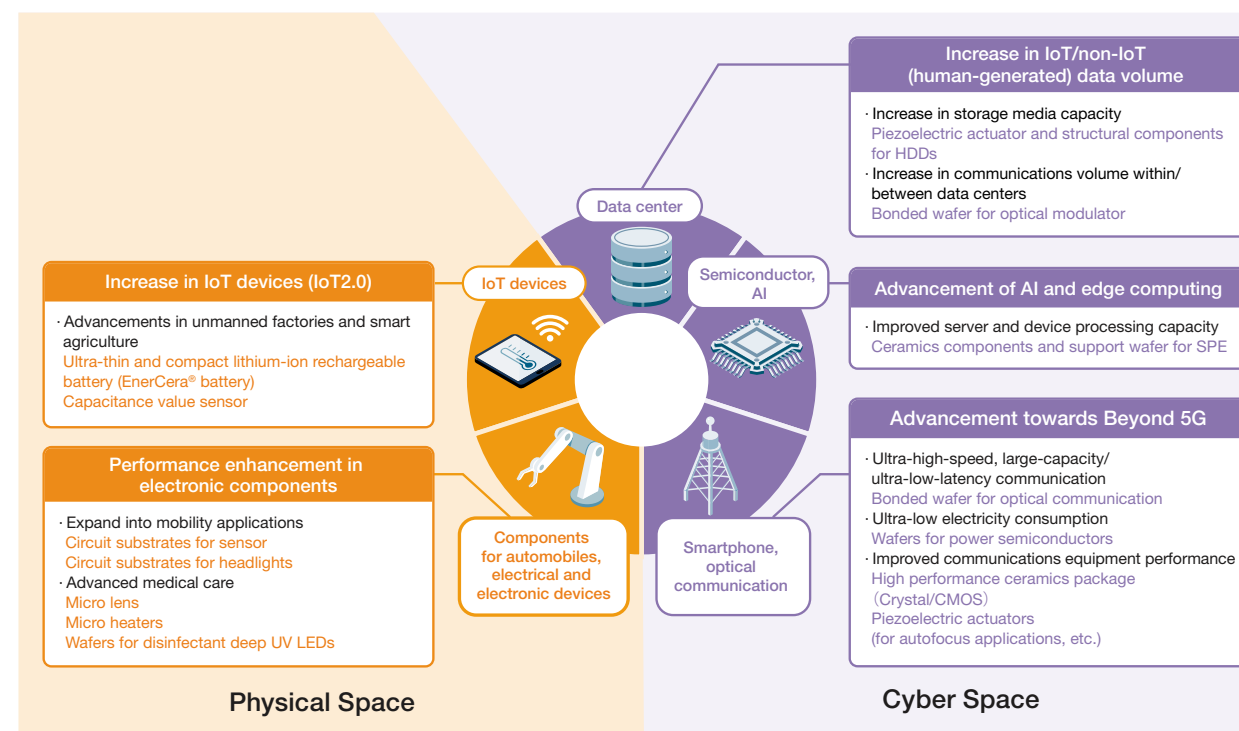
### ② Ceramic membranes

The NGK Group is developing various ceramic membranes that can separate specific gases and liquids from mixtures such as mixed gases and liquids. Currently, we are confirming the effectiveness of ceramic membranes in areas such as increasing oil extraction and recovering and separating CO<sub>2</sub> from natural gas. Moving forward, we will seek to further contribute to the CN field by separating hydrogen and methane in hydrogen transport. We will also promote demonstration tests and marketing activities for a variety of applications, including CO<sub>2</sub> separation from exhaust gas from factories and power plants, and reactions, separation, and purification in CO<sub>2</sub>-derived fuel synthesis (e-Fuel). Since 2023, we have collaborated with the CHITOSE Group<sup>\*1</sup>, a leader in the bioeconomy, to develop microalgae separation technology using ceramic membranes. By 2030, we are aiming to use ceramic membranes in major applications by strengthening our prototype creation and evaluation system and promoting marketing activities.

<sup>\*1</sup> Sponsors and operates MATSURI, the world's first partnership for building an algae industry

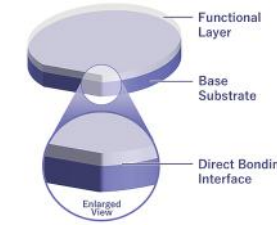


## DS Supporting advancements in digital technology to realize a more comfortable digital society



### Develop high-performance wafers that contribute to the manufacturing of advanced electronic devices

Electronic devices represent the foundation that supports the digital society. For nearly 10 years, the NGK Group has been involved in manufacturing the wafers that form the basis of these electronic devices. Unique to these products is that we achieve unprecedented performance and high quality by combining the base substrate and functional layer without using a bonding agent. Functional layer manufacturing technology is our core technology. We will incorporate the latest trends while strengthening collaborations between Corporate NV Creation, Corporate R&D, and Corporate Manufacturing Engineering to establish technology that will support and enhance our competitive advantage through 2050. We will also strengthen collaborations with suppliers to reduce costs by making full use of general-purpose substrates. To advance our development of high-performance wafers, we will dispatch researchers to research institutions throughout Japan and overseas, as well as consider capital alliances and M&A when necessary.



### Pursing the possibilities of ultra-thin and compact Lithium-ion rechargeable battery “EnerCera® battery” that resolves various issues

EnerCera was born from crystal direction alignment technology possessed by the NGK Group from our work as a ceramics manufacturer.

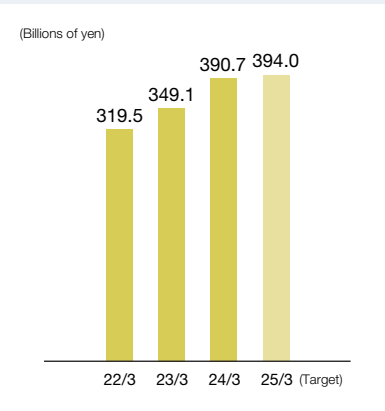
Compared to typical lithium-ion batteries, EnerCera is unique for having a slim, compact and lightweight profile while having the high energy density, low resistance, high heat resistance, and long life that makes it suitable for being embedded into an IC card. EnerCera is already being used in many applications such as environmental sensors and temperature control tags for transportation. As the risk of heat generation is extremely low, its use in wearable devices such as health appliances and smart insoles is also increasing. In the future, we will pursue further possibilities for EnerCera by supporting IoT and wearable devices, which are becoming smaller and more advanced. We will also advance initiatives for use in medical devices and other applications.



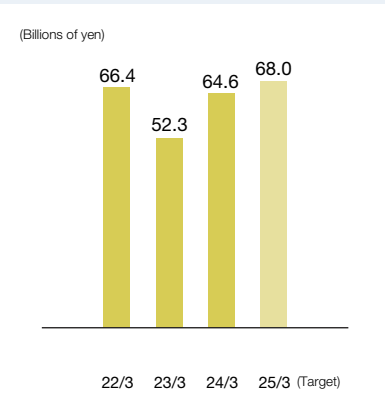
Ensure Growth Potential and Enhance Capital Profitability >>> Business Strategy by Segment

Environment Business

Net sales



Operating income



Business overview and outlook

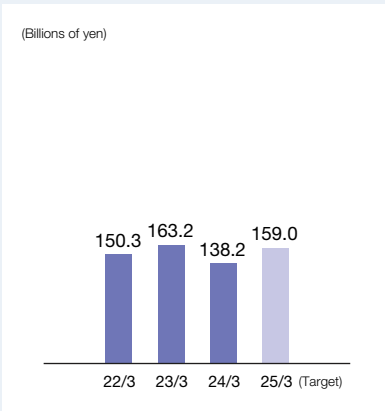
In FY2023, we achieved increased sales and income amid a year of intense changes in our business circumstances. The automotive industry recovered thanks to an improvement in the shortage of parts such as semiconductors, and shipments of automotive products increased in response to the tightening of emissions regulations. Additionally, yen depreciation also had a positive impact.

In FY2024, we are forecasting increased sales and income. While we do project a decrease in demand for certain products due to the progress of vehicle electrification, we forecast increased sales for products to Chinese markets and the Industrial Process Business. We also expect to achieve increased income on cost reductions and sales price revisions. Furthermore, we incorporated the Industrial Process Business from Energy & Industry Business Group as of April 2024, aiming to expand synergies in the fields of the carbon neutrality and the bio industry.

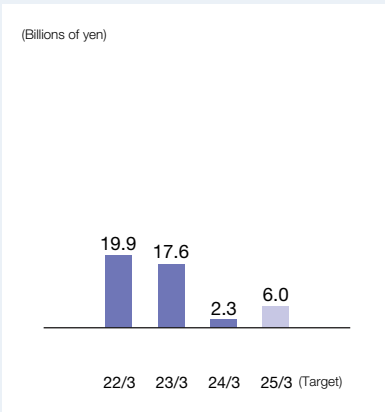
\*From FY2024, we moved the Industrial Process Business from the Energy & Industry Business to the Environment Business. Figures include performance from the Industrial Process Business.

Digital Society Business

Net sales



Operating income



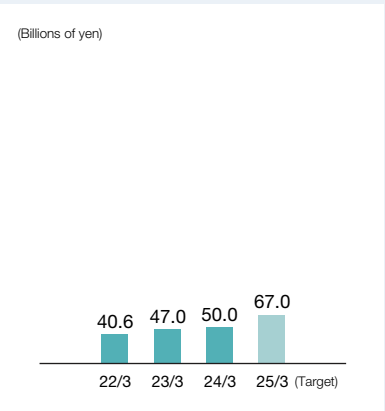
Business overview and outlook

During FY2023, sales decreased despite the positive impact of yen depreciation. Constraints on semiconductor and data center investments caused prolonged inventory adjustment periods, which in turn triggered a decline in shipments of products for semiconductor manufacturing equipment, piezoelectric micro-actuators for hard disk drives (HDDs), and other products.

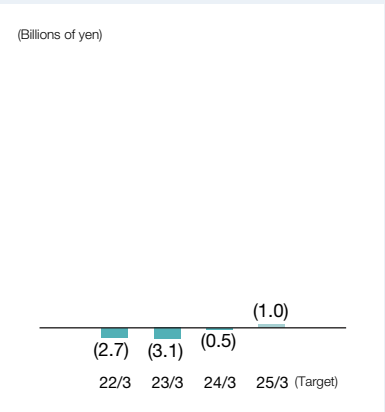
For FY2024, we are forecasting a gradual recovery in market conditions for digital-related products from the second half of the fiscal year. To ensure we capture demand as the market recovers, we will continue with investments for production expansion while also advancing the development of next-generation products and developing new clientele. At the same time, we will also reevaluate the production structure of each business to promote cost reductions and DX initiatives as we aim to improve profitability.

Energy & Industry Business

Net sales



Operating income



Business overview and outlook

In FY2023, we were able to achieve a income for the first time in eight periods. In addition to strong investment in transmission network enhancement and renewable energy-related projects leading to increased demand for insulators in markets such as the USA, Taiwan, and Australia, continued shipments of NAS® (sodium-sulfur) battery systems for electric energy storage and products for industrial equipment and yen depreciation also had a positive impact.

In FY2024, we are forecasting increased sales through the continuation of demand for insulators and orders received for large-scale projects overseas involving NAS batteries. However, the impact of soaring prices for raw materials and fuel will be unavoidable. To mitigate this, we will focus on cost reduction, strengthening the supply chain, and implementing other measures to improve profitability and foster business growth.

Environment Business

Basic Strategies for the NGK Group Vision: Road to 2050

- > Will serve as the profit center for securing the capital needed to promote investments aimed at expanding sales in CN/DS-related markets, areas in which the NGK Group strives to resolve social issues
- > Will develop new CN-related products utilizing unique technologies and explore new markets in collaboration with the Corporate NV Creation

Market Needs

- Global carbon neutrality trend
- Worldwide tightening in emissions regulations

Growth Strategy

- Launch next-generation products to markets with high functionality and high added value that respond to tightened regulations
- Generate income by productivity improvements including DX
- Provide new values in CN-related fields



Promoting a business structure transformation into CN-related domains with earning power maintained, under the two-division structure combining the Automotive Ceramics and Industrial Process.

Senior Vice President  
Group Executive, Environment Business Group

Jun Mori

The Environment Business Group, which engaged in business that contributes to the environment in a broad sense, is tasked with two missions aimed at promoting sustainable growth for the NGK Group. The first mission is to serve as a profit center that generates immediate revenue. While we will see a demand contraction over the medium- to long-term amid the global vehicle electrification, we forecast being able to maintain net sales on a scope of 300 billion yen through around 2030. In addition to continuing sales of major products such as ceramics for emissions control and, NOx sensors for measuring nitrogen oxides (NOx) in automobile exhaust gases, we will also plan to launch next-generation products with high-function and high-added-value to respond to increasingly stricter regulations in Europe and other regions.

At the same time, we will pursue highly profitable, highly efficient business management by advancing measures related to cost reduction and inventory control. These measures will be based on the NGK ROIC (operating income / business assets), which we use as a management metric. The cash generated by this business group will serve as a source of capital for various growth strategies aimed at realizing the NGK Group Vision. By fulfilling this mission, we will have created a path for the future of the Group, and so

we are committed to uniting towards fulfilling this critical role.

The other mission is to drive new value provision in CN-related fields, one of the target sectors outlined in the NGK Group Vision. We are focusing on the development of products and technology that can contribute to society's environmental needs. Examples of these products include ceramics for Direct Air Capture (DAC), which directly captures CO<sub>2</sub> in the air, and sub-nano ceramic membranes, which can separate the molecules of CO<sub>2</sub> and other gases. We are steadily advancing various preparations towards our full-scale engagement in CN business, including initiatives such as newly establishing the CN Business Creation Division, repositioning the Industrial Process Business Division, and reorganizing our new product development sites.

We live in times when it is difficult to predict future trends. However, even in these times of dramatic changes in our environment, there is no change in our goal of pursuing carbon neutrality. We will accelerate product development making maximum use of our know-how accumulated through products for internal combustion engines and complete our transformation into the CN business. In doing so, we will contribute to the realization of a sustainable society by providing values unique to the NGK Group.



# Digital Society Business

## Basic Strategies for the NGK Group Vision: Road to 2050

- Will create synergy by concentrating product groups that contribute to a digital society, linking internal and external information
- Expand sales of DS-related products with a focus on semiconductor-related products, and aim for net sales of over 300 billion yen by 2030
- Develop carbon neutral products for EV/HEV and hydrogen infrastructure

### Market Needs

- Global increase in data traffic
- Advancement of communications technology for Beyond 5G
- Increase in semiconductor investments driven by advancements in AI and edge computing

### Growth Strategy

- Capture expanding semiconductor and electronic parts demand, conduct timely capital investments, reduce costs, increase productivity
- Pursue DX (data utilization, process automation) to establish smart factories
- Early creation of new products: Collaborate with Corporate NV Creation towards commercialization



**Become a pillar of growth by incorporating added value to increase competitiveness and contribute to problem resolution for the digital society**

Senior Vice President  
Group Executive, Digital Society Business Group

**Hiroto Matsuda**

The Digital Society Business Group comprises businesses related to the digital society (DS). Engaging in three segments, the SPE Business (products for semiconductor manufacturing equipment), the Electronic Device Business, and the New Metals Business. Through these businesses, we will advance the dissemination of products that contribute to resolving the various problems facing the digital society. The most important mission of this business group is to grow into a second core business after the Automotive Ceramics Business. Specifically, we have outlined the earnings target of achieving net sales of over 300 billion yen in 2030, which would represent a three-fold increase over FY2023.

Currently, the semiconductor and information communications markets are struggling to see a recovery in demand but, over the medium to long-term, these markets are expected to see growth driven by advancements in Beyond 5G, AI, and edge computing. We also project demand growth and business expansion for our DS-related products, and will work to develop high-added-value products that incorporate our proprietary technology. NV1000 (the goal of net sales of 100 billion yen or more from new products), is a target we have outlined for 2030 as a milestone on our way to realizing the NGK Group Vision 2050. To achieve this

target, we are applying a sense of urgency in our new product development. Specifically, for DS-related products, we will expand the CMOS package business, which is expected to see growth in the imaging and communications sectors, and aim for the rapid commercialization of bonded wafers, which are used in optical communications and mobility sensors.

In the carbon neutrality domain, we are projecting demand growth for Silicon Nitride (SiN\*) AMB substrates, which are seeing growing adoption for use in the power modules of EVs driven by increasing EV adoption. We will also consider developing materials for hydrogen infrastructure to support the full-scale realization of a hydrogen-based society.

As a business group that seeks to bring various new products to growth sectors, we play a leading role in Commercialization, one of the Five Transformations the NGK Group is pursuing towards realizing our Group Vision. We will collaborate with Corporate NV Creation, the division in charge of marketing, and utilize alliances and cross-sector partnerships to accurately identify market needs and technology trends. We will propose high-value-added products and solutions that incorporate proprietary technology to contribute to problem resolution in a continuously evolving digital society.

\*SiN: Si<sub>3</sub>N<sub>4</sub> (silicon nitride)

# Energy & Industry Business

## Basic Strategies for the NGK Group Vision: Road to 2050

- Expand revenues by capturing growth trends on CN-related markets to propose new social value in electricity-related fields
- Stably offer society highly reliable products that support electricity infrastructure, which is becoming increasingly sophisticated due to DS

### Market Needs

- Global carbon neutrality trend
- Growth of renewable energy
- Promotion of digital infrastructure development

### Growth Strategy

- Contribute to the realization of CN desired by customers by offering products and services that support rapidly expanding and evolving electricity infrastructure
- Strengthen profitability by aggressively transforming the structure of these two businesses and efficiently utilizing assets



**To realize the carbon neutrality and digital society outlined in the NGK Group Vision, focus on the sustainable provision of reliable products that meet the quality and affordability demands of customers.**

Senior Vice President  
Group Executive, Energy & Industry Business Group

**Hiroyuki Shinohara**

The Energy & Industry Business Group is comprised of a two-business structure, the Energy Storage Business and the Insulator Business. Under this structure, we are aiming to contribute to society's essential infrastructure by offering unique products and services for the electricity and energy fields.

The issue is being successful at both offering the products required by society and achieving profitability. Positioning NAS<sup>®</sup> batteries, the main product of the Energy Storage Business, as a pillar of our growth strategy, we will advance the formation of a business model that leverages the characteristics of these products, including their high capacity, long service life, and long duration charging/discharging capabilities. By expanding sales in overseas markets, where demand is stronger, we are seeking to link shipment volume to income generation. Recently, we received a large-scale order through the German chemical manufacturer BASF\*, with whom we have a sales partnership. The characteristics of NAS batteries align well with the storage needs of renewable energy such as solar and wind power generation, which has numerous limitations and can be influenced by the climate. For this project, our products will enable the stable provision of renewable energy to a green hydrogen production process, ensuring the efficient production of green hydrogen. Moving

forward, we can expect that our partnership with BASF will lead to additional orders received. We will leverage such success to promote cost reductions by pursuing stable production through process automation and timely and appropriate procurement from parts and materials suppliers.

The Insulator Business continues to see firm demand in regions such as US and Australia, where we have production facilities. In Japan as well, planned power grid investments are being implemented, so we will work to steadily capture that demand and engage in efficient business management to maintain profitability.

Today, there is no avoiding climate change response or the arrival of a digital society. It is also clear that we will see dramatic increases in demand for the renewable energy needed to realize carbon neutrality, including applications such as the rapid charging of electric vehicles and powering the data centers that support AI. In this environment, we will closely monitor ever-changing market and technology trends. We will work to continuously provide a product selection that supports the stable supply of electricity and the effective use of renewable energy as we remain committed to contributing to the creation of a prosperous society.

\*For a green hydrogen production project by HH2E AG in Germany.

# Intellectual Property Strategy



The NGK Group is aiming to expand business, increase profitability, creating new businesses and enhancing the competitiveness of existing business through our intellectual property strategy. We work to maximize the utilization of retained intellectual property while also promoting intellectual property activities that contribute to our management strategy.

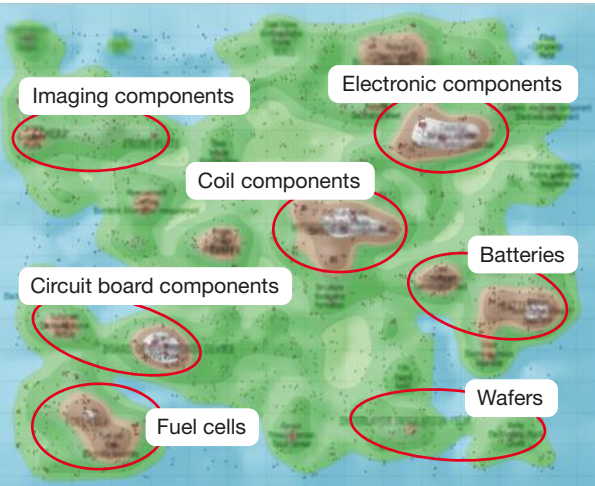
## > What We Aim for in 2030

The NGK Group positions intellectual property (IP) as an important management resource. Thus far, we have supported business through IP activities focused on securing global patent rights. Recent years have seen an increase in the importance of investing in and utilizing intangible assets. In addition to conventional IP protection efforts, we also recognize the need to conduct activities focused on IP utilization. This includes investing in intellectual property that is aligned with our management strategy. These activities will

contribute to new business creation, help us secure a competitive advantage in the future, and contribute to the realization of the NGK Group Vision. To this end, we outline the following as what we aim for in 2030:

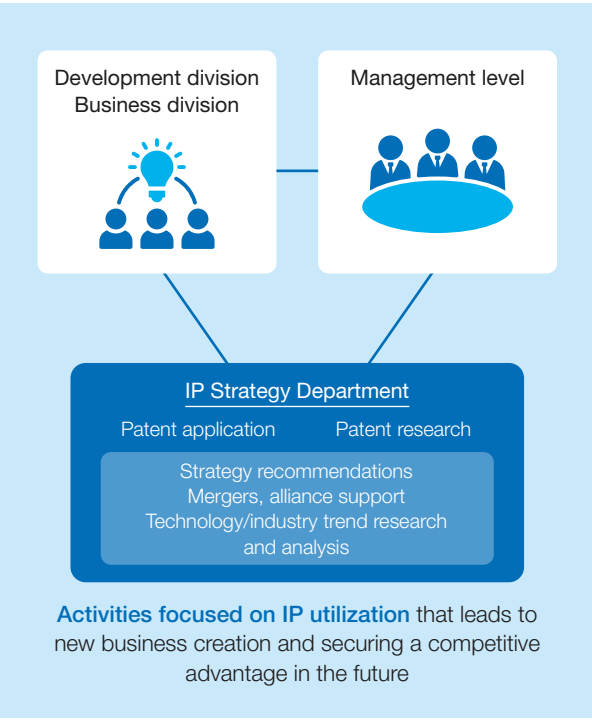
- 1) Three-pronged promotion of business strategy/development strategy/IP strategy
- 2) Utilize tools such as IP Landscape® to promote activities focused on IP utilization and initiatives aimed at supporting these activities.

[IP Landscape example]  
Search for new applications for NGK's retained technology



This is a visualization of our patent application distribution. The contour lines forming mountains and islands represent concentrations of patent applications. Dark colored regions indicate that numerous applications have been filed. This tool helps us engage in strategic IP activities by recognizing strengths and weaknesses in our own IP activities and in the IP strategies of our competitors.

[What We Aim for]



## > Promotion of IP Activities

At the beginning of each fiscal year, the IP Strategy Department collaborates with business and development divisions to hold IP Activity Meetings for each product or development unit. The objective of these meetings is to have relevant departments discuss and set IP activity goals, and then propose IP strategy towards goal achievement. In FY2024, we are aiming to strengthen these activities. Persons

responsible for IP strategies in each business and development division will lead efforts to strengthen IP activities. We will also aggressively promote IP awareness activities for employees. These activities will include holding IP seminars and introducing IP analysis methods. We will also provide business and development divisions with IP education led by IP Strategy Department staff.

## > New Business Creation and Early Commercialization

### New Business Creation

Through patent analysis, we will work to create new businesses by exploring new development domains for our core technology and examining new applications for existing technology.

We are also proactively engaged in DX promotion. For example, we will use large language models (LLM) to search for promising new markets.

We will use analysis results gained from IP information to extract candidates for collaborations and alliances related to new businesses. This will also contribute to development and business strategy formulation. Through such IP activities, we will promote new business creation and early commercialization that maximizes the strengths of the NGK Group.

### Securing Competitive Advantage for New Businesses

To secure a competitive advantage for new businesses, we steadily work to secure IP rights for our own technology and build a strong patent strategy. With new businesses in particular, we are promoting the utilization of a mixed IP strategy that combines various IP rights. This includes a focus on patent strategy related to our supply chain, including business model patent utilization and design rights.

At the same time, we appropriately distinguish between

important know-how that should be kept secret, and technology we should seek the acquisition of rights. Through patent analysis, we also work to ascertain competitor and technology trends. Based on those analysis results, we provide development and business departments and management with specific alliance candidates.

Through these IP activities, we are helping secure a competitive advantage for new businesses.

## > Strengthen Competitiveness of Existing Businesses

To maintain and strengthen the competitiveness of existing businesses, we conduct inventory of our held patents to ascertain the number of our right-to-practice patents and patents with influence over other companies. Through patent analysis for our own patents and competitor patents, we propose appropriate IP strategy that is aligned with the business environments of our products.

We are also engaged in a mixed IP strategy that combines various rights, including business model patent utilization,

design rights, and trademark rights. This strategy promotes the multifaceted protection of our business and helps increase the brand value of the NGK Group. At the same time, we engage in effective IP management by appropriately distinguishing between important knowhow that should be kept secret and technology for which we pursue rights.

Through these IP activities, we are working to maintain and increase the competitiveness and profitability of the NGK Group.





## Digital Transformation (DX)



The NGK Group positions Digital Transformation (DX) as the driving force of our Group efforts towards achieving the Five Transformations. We formulated the NGK Group Digital Vision to accelerate the promotion of DX for the entire NGK Group. In 2030, we are aiming to be a corporate Group for which data and digital technology utilization is second nature.

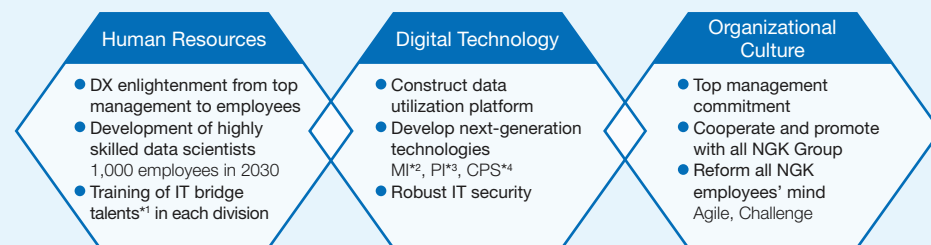
### NGK Group Digital Vision

What we want to be

Apply digital technologies as a key driving factor of Five Transformations to realize the Third Foundation and lead to carbon neutrality and digital society.

Transform NGK Group into a digital-oriented company by 2030

What we must do



\*1 Bridge talents: Human resources that can adopt measures that strike a balance between management, operations and IT

\*2 Materials informatics (MI): Applying informatics (information science) such as machine learning and big data, the core technology of AI, towards new materials and new component development

\*3 Process informatics (PI): Applying information sciences to new process development

\*4 Cyber-physical system (CPS): Creating value by using real-world data to recreate virtual spaces for analysis, and then provide feedback for real-world applications

### > Current Position of DX

#### ● Looking Back on STAGE 1

In April 2022, we outlined the NGK Group Digital Vision and a roadmap for promotion through 2030. Centered on the three pillars of human resources, digital, and organization and culture, we are engaged in three-stage DX promotion activities. FY2023 represented the final fiscal year for Stage 1, the first step of this initiative.

During Stage 1, we worked to build a promotion structure by establishing a DX promotion organization and developing DX human resources. We also launched and promoted initiatives such as incorporating digital technology into increasingly advanced manufacturing processes, materials informatics, and cyber-physical systems. A portion of the results of those efforts are summarized in the table below:

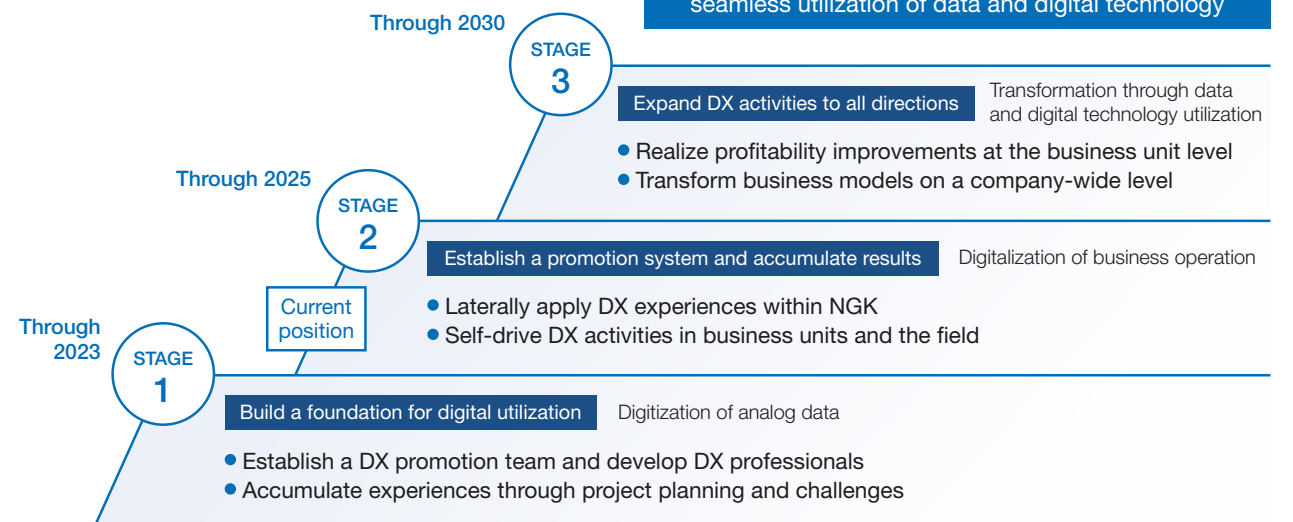
Progress on What We Must Do to Realize the NGK Group Digital Vision. Recognized for our efforts, in May 2024, NGK Was selected as a Noteworthy DX Company on the list of Digital Transformation Stocks (DX Stocks) jointly selected by the Ministry of Economy, Trade and Industry (METI), the Tokyo Stock Exchange (TSE) and the Information-technology Promotion Agency, Japan (IPA). This marks the second consecutive year the NGK Group received this recognition.



#### Progress on What We Must Do to Realize the NGK Group Digital Vision

	FY2030 Targets	Results from STAGE 1
<b>Human Resources:</b> Development of highly skilled data scientists	1,000 digital-oriented employees	Human resources developed: 692 (progress ahead of schedule, projecting achievement around FY2026)
<b>Digital Technology:</b> Construct data utilization platform	Construct data utilization platform in each business divisions	In 2022, we introduced this data utilization platform into our domestic HONEYCERAM plant and then expanded adoption to overseas plants in 2023. The data utilization platform was also incorporated into other businesses and is currently in use.
<b>Digital Technology:</b> Materials Informatics	Reduce material development lead time for all products to 1/10 of FY2020 level	We started designing a system that will use AI, etc., to reduce development lead time for certain materials by two-thirds and increase test data output speeds by five-fold compared to previous systems.
<b>Digital Technology:</b> Cyber-physical Systems	Build a virtual production line and utilize simulations	Conducted validation testing (3 times) for production equipment operations in virtual spaces. Preliminary validation enabled production downtime associated with facility modifications to be reduced by one-third.
<b>Organizational Culture:</b> Establishment of DX Promotion Sections	Establish DX promotion teams in all business divisions	Established promotion divisions in headquarters departments and certain business divisions

### DX Promotion Roadmap



#### ● Further DX in STAGE 2

From this fiscal year, we will transition into Stage 2: Establish a promotion system and accumulate results. We will adopt our early successes with DX promotion throughout the Group to establish a structure for autonomous engagement in DX activities by each division.

We will use data and digital technology to further accelerate our existing efforts to transform manufacturing. We also started a full-scale initiative to use digital technology in marketing towards creating a framework for value creation that will contribute to us achieving NV1000. Furthermore, we will link DX activities to maximizing workflow optimization between the headquarters and indirect departments. For example, generative AI is a powerful tool for promoting

workflow optimization. Since September 2023, we launched a dedicated internal interactive generative AI for all employees, and are promoting the use of this tool.

As we pursue such proactive measures, defensive measures will remain important. We will work to establish a central global IT security structure to respond to growing worldwide information security risks. We will also focus on education to improve the IT literacy of employees.

With technology evolving right before our eyes, the level of commitment to DX is a factor that will influence the future of a company. The NGK Group is aiming for the use of data and digital technology to become second nature for us as we unite towards our tireless pursuit of new value creation.

### TOPICS

#### Started Validation Testing of New Application Searches by Using Unique AI

The NGK Group partnered with Stockmark, Inc., which develops and manages AI services, to start validation testing aimed at using AI to increase the precision and speed of new application searches for NGK products and technology. We will promote rapid new business creation by combining the internal and external literature of the NGK Group, including our patents and research publications, with proprietary AI developed by Stockmark to accelerate application searches.

Previously, human analysis of massive amounts of text data was required to conduct new applications searches cross-referencing our fundamental technology with social issues. Using AI instead of humans to conduct text data analysis leads to significant reductions in time and labor, enabling efficient evaluations of untapped markets where we can apply our strengths. Through validation testing, we are aiming to generate over 100 case studies before the end of the year. From those, we plan to identify promising potential for new applications.

\*This company uses advanced natural language processing technology to support the new business creation activities of corporations.

AI concept

**Question** Show me examples of the OO technology used in automobile exhaust purification being used to resolve social issues in the OO domain.



**Answer** Social issues in the OO domain including XX and YY. Potential applications for OO technology include ZZ.

## Human Capital Management



As a provider of diverse solutions for society and industry, and as a corporate Group that generates new value in ceramics, human capital are the source of sustainable growth at NGK. We will aim for further increases in our enterprise value by promoting efforts related to fostering human capital and developing our internal environment, initiatives towards realizing our Group Vision.

### > Basic Approach

The NGK Group is reforming our business structure by establishing Five Transformations we must implement to realize what we want to be in 2050: A Company to Contribute to Carbon Neutrality and Digital Society with Our Unique Ceramic Technologies. Among these Five Transformations, we have placed our response to ESG issues at the core of our management. We recognize that human resources are a form of capital instead of a cost. Based on this recognition, we believe that maximizing the value of our human resources by linking our management strategies and human resource strategies will lead to an improvement in our enterprise value and growth.

We formulated the NGK Group Human Capital

Management Policy, as well as the Human Resource Development Policy and Workplace Development Policy which embody it, in June 2023. This was based on the recent increase in requests for the disclosure of information from society relating to human resources and the NGK Group Vision.

It is none other than each one of our employees who will create new value for a sustainable society by implementing Five Transformations to realize the NGK Group Vision: Road to 2050. We will maximize the abilities of our employees by providing prosperous and energetic workplace environments to boost the human resources who will take on the challenge of transforming the NGK Group.

### > NGK Group Human Capital Management Policy

The NGK Group defines “People who embrace challenges and teamwork” as one of Our Values of NGK Group Philosophy, and we are committed to realize Our Mission: Enriching Human Life by Adding New Value to Society. The NGK Group is committed to drive the Five Transformations to realize the NGK Group Vision, and we believe that the active engagement of each personnel is crucial for accomplishing the Five Transformations. We define the core of the Group’s human capital management as hiring and developing personnel to enrich team members dedicated to the Five Transformations, and establishing an environment where each personnel can perform at full potential. Building upon this core belief, we establish the Human Resource Development Policy and Workplace Development Policy as follows.

### > Human Resource Development Policy

The NGK Group develops personnel with the following abilities and mindset required to realize the Five Transformations.

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

### > Workplace Development Policy

The NGK Group develops the following workplace environment where each personnel can perform at full potential.

- **Diverse and Inclusive Workplace**  
A workplace where everyone is acknowledged and respected, regardless of external attributes such as race, nationality, gender, and age, as well as internal attributes such as religion, beliefs, experiences, and values.
- **Enriched and Lively Workplace**  
A workplace where diverse personnel can feel rewarded, stay healthy both physically and mentally, have colleagues we respect and enjoy working with, and maintain a good work-life balance.
- **Open Workplace that encourages challenges**  
A workplace with open communication and psychological safety, that embraces courageous challenges for growth.

### Message from the General Manager of the Human Resources Dept.

## Supporting challenges undertaken by the NGK Group

Aim to further improve enterprise value and realize the Five Transformations indicated in the NGK Group Vision by fostering human capital based on our Human Resource Development Policy and proactively creating environments that contribute to the utilization of diverse personnel.

Vice President  
General Manager,  
Human Resources Dept.

**Masato Nozaki**



required and continuously act with a sense of speed. Our Workplace Development Policy outlines three keywords aimed at increasing our probability of success at realizing the Five Transformations: Diversity, Prosperous and Energetic, and Challenge.

Essential to realizing the Five Transformations will be human resources who drive the thinking and creativity that lead to innovation. Equally critical is that we incorporate the alternative perspectives and approaches of human resources of diverse backgrounds and experiences. The foundation for maximizing the potential of diverse human resources is the creation of a workplace that recognizes and respects others, regardless of race, nationality, gender, age, beliefs, experience, or values.

Another key factor in maximizing the potential of diverse human resources is a workplace that is prosperous and energetic. Motivating work, self-growth, colleagues you can respect, physical and mental health, compensation commensurate to your efforts, and time you can spend with family or friends. I believe the some of these elements promote a prosperous and energetic work environment, and we will work towards enhancing all of these elements as part of our path to achieving the Five Transformations.

The commitment to challenge is also essential to achieving the Five Transformations. Challenge is also a driving force the individual growth and advancement of employees. Failure is a part of challenge, and we will work to cultivate an open corporate culture in which employees can feel assured in challenging themselves to new ideas and strategies without having to fear failure.

In response to an operating environment faced with constant change, the NGK Group’s business strategy will also evolve. This also drives changes in the type of human resources we require, and we are working to respond appropriately to these changes.

The Human Resource Development Policy defines three types of human resources required to realize the Five Transformations outlined in the NGK Group Vision. There are two reasons for defining our ideal human resources. The first is the maximization of offered value. The value offered by the NGK Group is generated from the knowledge, skills, and capabilities that have been acquired by each employee within the NGK Group. Our ability to offer even greater value depends on each member of our Group acquiring more advanced knowledge, skills, and capabilities. Also, teamwork is essential to assembling those knowledge, skills, and capabilities into a collective unit.

The second reason is promoting a sense of speed. We live in an age of volatility, uncertainty, complexity, and ambiguity (VUCA). As the term suggest, the world today faces a lack of transparency that makes it difficult to predict the future. Amid such an environment, it will prove difficult to adapt to the speed of change simply by waiting to act on orders received from your superiors. I believe the key to responding to change is that each employee constantly thinks about what is



➤ Human Capital and Workplace Development Initiatives

● Initiatives for Maximizing the Potential of Diverse Human Resources

The NGK Group hires diverse human resources based on a basic policy of employment stability and equal opportunities, and regardless of race, nationality, gender or sexual preference or gender identity, age, religion, creed, or disability. We promote diversity and inclusion policies such as work-life balance, employment opportunities for persons with disabilities, and enlightenment activities to promote diversity understanding. We are also creating flexible workstyle options such as teleworking. Additionally, we provide opportunities for human resources to pursue diverse career paths autonomously based on their individual interests, aptitude,

and job type.

We are also focused on enhancing our workplace environments to promote the development of the type of human resources required by the NGK Group and ensure those human resources are able to apply their respective skills. We conduct annual organizational vitality surveys to ensure we are providing workplace environments that make employees feel comfortable and motivated. We ascertain the opinions and requests of employees at each location to identify problem points and the need for improvements.

● Health Management

An essential element of creating a prosperous and energetic workplace is promoting the physical and mental well-being of each employee. In 2023, we created a health management strategy map and published revised metrics related to policy implementation and individual awareness and behavior. This better clarifies the correlation between management issues and health management. We will use this map towards the

more effective implementation of our policies. We will implement health management policies with a focus on reducing total labor hours, reducing the number of high-stress individuals, and improving manager literacy. We will also enhance our education and health guidance for individual employees to promote awareness and activities aimed at maintaining and improving individual health.

● Specific Human Capital Development Policies

Developing digital proficient human resources

In accordance with the NGK Group Digital Vision, we are promoting DX awareness among all employees. We are also aiming to develop data utilization personnel (1,000 people by 2030) and develop bridge personnel. We will provide tiered education and training based on experience and roles to foster development. These tiers will include DX Leaders who will promote DX in business divisions, DX Supporters who will assist leaders, and DX Beginners who will learn data utilization concepts and processes.

Innovation training

In this rapidly changing business environment, we conduct backcasting from the SDGs and social issues to provide innovation training that helps employees learn key points related to the creative thinking process. This leads to innovation and the process of conceptualizing new businesses. We will also establish a proposal system through which themes generated through this training can be linked to new business creation.

Human Capital Development Structure

			Applicable to				
			At time of hiring or promotion			Open enrollment	Selective enrollment
			Hiring	Promotion	Key personnel		
Philosophy, Group Vision, Policy	Mission Vision Value		Group Philosophy	●	●	●	
			Group Vision	●	●	●	
			Corporate Business Principles and Code of Conduct	●	●	●	
			ESG Management	●	●	●	
	Human Capital Management Policy	Human Resource Development Policy	Advanced knowledge, skills, and capabilities	●	●	●	●
			Teamwork	●	●	●	●
			Autonomous, transformative	●	●	●	
		Workplace Development Policy	Respect for diversity	●	●	●	
			Prosperous and energetic workplace	●	●	●	
			Challenging and open workplace	●	●	●	
	Compliance Matters		Compliance	●	●	●	●
			Safety, quality, environment	●	●	●	

● Group-wide education ● Division-specific education

Promoting ESG Management

NGK Group Basic Sustainability Policy

Since our founding, the NGK Group has worked to solve social issues through our unique ceramic technologies. Based on the NGK Group Philosophy of Enriching Human Life by Adding New Value to Society, we aim to continue contributing to the realization of a sustainable society and to earn the trust of society by meeting its expectations toward

us. We have incorporated this thinking into the NGK Group Basic Sustainability Policy in April 2023.



NGK Group Basic Sustainability Policy  
<https://www.ngk-insulators.com/en/info/policies/sustainability.html>



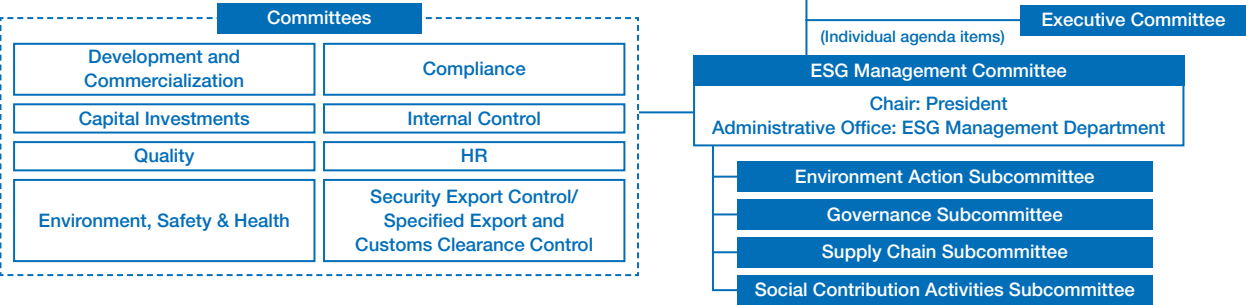
ESG Action System

ESG (Environmental, Social, Governance) is central to the management of the NGK Group.

In 2019, the ESG Committee was established as a body for information sharing, opinion exchange and policy discussion among senior management. In April 2022, the

ESG Committee was reorganized as the ESG Management Committee, which is chaired by the President, as a body reporting to the Board of Directors for strengthening initiatives on sustainability issues that incorporate elements of ESG and the SDGs.

ESG Action System



Key ESG Activity Themes

The NGK Group defines materiality based on the NGK Group Basic Sustainability Policy. And we work to enhance the effectiveness of governance to serve as the foundation of value creation as we promote environmental and societal initiatives.



Materiality  
<https://www.ngk-insulators.com/en/sustainability/materiality.html>



NGK Group Basic Sustainability Policy	
Materiality	
E	<ul style="list-style-type: none"><li>Initiatives for climate change</li><li>Promotion of resource recycling</li><li>Prevention of environmental pollution</li><li>Conservation and restoration of biodiversity</li></ul>
S	<ul style="list-style-type: none"><li>Pursuit of quality and product safety</li><li>Contribution to digital social infrastructure</li><li>Enhancing value of human resource</li><li>Respecting human rights</li><li>Promotion of sustainable procurement</li></ul>
Foundation of Value Creation (Governance)	
G	<ul style="list-style-type: none"><li>Compliance</li><li>Corporate governance</li><li>Risk management</li></ul>

Endorsement and Participation in Initiatives

Based on our corporate policy, NGK is striving to provide better value through our business activities to help achieve a sustainable society. We are actively involved in international initiatives to help resolve global social challenges as a responsible corporate citizen.



## Initiatives for Climate Change

### Information Disclosure Based on TCFD Recommendations

In February 2020, the NGK Group announced our support for recommendations issued by the Task Force on Climate-Related Financial Disclosures (TCFD) created by the Financial Stability Board (FSB). We are currently evaluating how to apply the TCFD framework towards resolving issues facing our Group operations, such as the risks and opportunities posed by climate change, and towards necessary information disclosure.



The Task Force on Climate-Related Financial Disclosures (TCFD) was established by the Financial Stability Board (FSB). Many Japanese companies chose the G20 Osaka Summit in June 2016 as an opportunity to express support for the task force (1,488 companies and organizations as of November, 2023).

### Governance

In April 2021, we announced the NGK Group Vision: Road to 2050. In this Group Vision, we position responding to ESG issues as a core management theme and outline the goal of being a company that contributes to carbon neutrality and the digital society using our ceramic technologies. Recognizing climate change response as one of the highest-priority issues to achieving sustainability for our planet, we drafted the NGK Group Environmental Vision as an extension of the NGK Group Vision. In this Environmental Vision and our Carbon Neutrality Strategic Roadmap, we outline achieving net zero CO<sub>2</sub> emissions for our business activities by 2050. Specific activities include setting management metrics and goals for each fiscal year of our 5-Year Environmental Action Plan. Our ESG Management Committee chaired by the President deliberates on these metrics and goals at least once a year, and issues reports to our Board of Directors. We also have incentivized CO<sub>2</sub> emissions reduction by adding achievement benchmarks to the performance-linked bonus evaluation criteria for Directors and Executive Officers.

Members from relevant divisions participate in Environment

Action Subcommittee within the ESG Management Committee to evaluate measures for information disclosure based on TCFD recommendations. The subcommittee's results are then deliberated by the ESG Management Committee before being reported to the Board of Directors. This subcommittee is also focused on achieving carbon neutral business activities by no later than 2050, one of the goals outlined in our Action Plan. The subcommittee works towards this goal by also promoting measures such as energy saving and furnace fuel conversion from fossil fuels to carbon-free fuel.

The ESG Management Committee submits reports on its deliberations, including ESG issues such as our disclosure response for the CDP, to the Board of Directors (at least once per year).



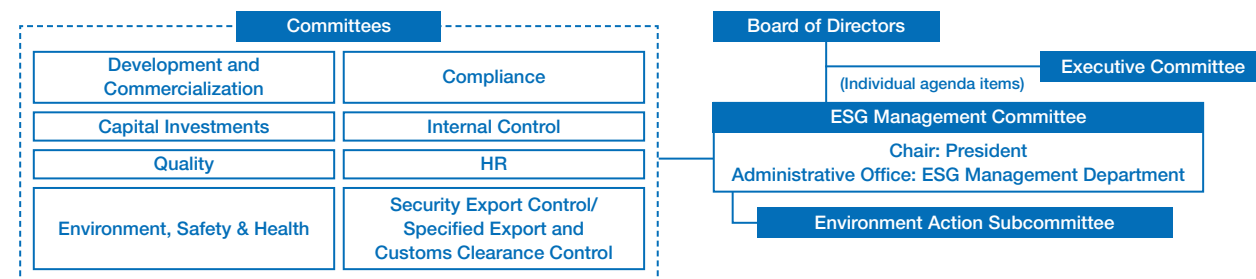
LINK

NGK Group Vision  
<https://www.ngk-insulators.com/en/info/vision/>

NGK Group Environmental Policy, Environmental Vision  
<https://www.ngk-insulators.com/en/sustainability/environment-vision.html>



### Framework Related to Climate Change Response



### Strategy

#### ● Particularly Important Risks and Opportunities

We have identified risks and opportunities in line with the TCFD categories for each time frame and scenario. We conducted qualitative assessment of the magnitude of financial impact of each risk and opportunity with reference to the risk assessment criteria of all Group companies. We also quantified the financial impacts for some items that were thought to have a certain impact and could be quantitatively assessed based on these scenarios.

Furthermore, this scenario analysis is not a forecast of

NGK Group performance, but rather analyzes the impacts of the risks and opportunities posed by climate change on the NGK Group under each scenario. It is intended to be used in considering strategies and responses from here on out. The information used to calculate these financial impacts is the information available at the time of the examination, and contains uncertainties and assumptions.

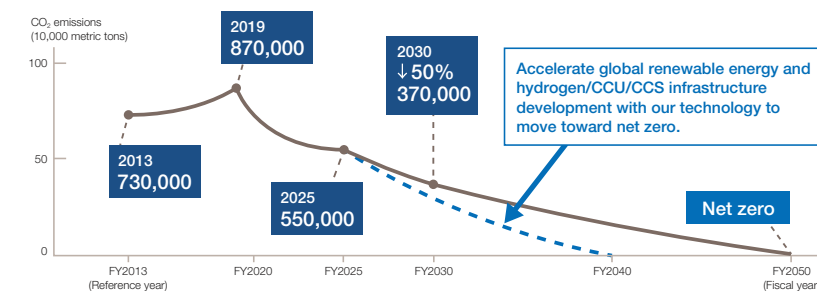
\*Information on the risks and opportunities of shifting to a carbon neutral society (1.5°C scenario) and the physical risks and opportunities associated with the emergence of climate change (mainly the 4°C scenario) is provided on P51-52.

### Metrics and Targets

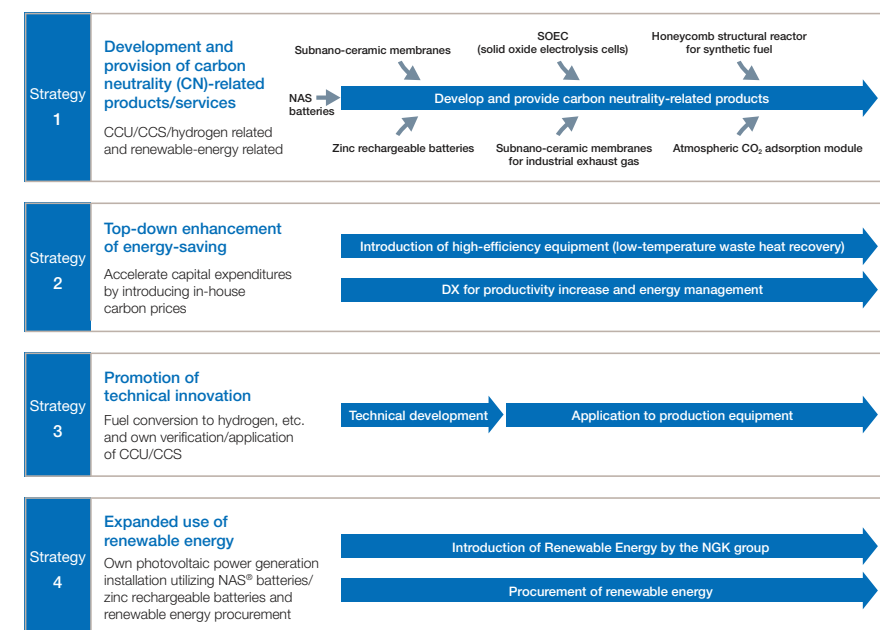
We drafted the Carbon Neutrality Strategic Roadmap to promote goal achievement that will enable us to realize the NGK Group Environmental Vision. We set milestone targets ahead of our 2050 goal of net zero CO<sub>2</sub> emissions for the

entire Group. These milestone targets call for a 550,000 ton reduction in emissions by 2025 (25% reduction compared to 2013 (reference year)) and a 370,000 ton reduction by 2030 (50% reduction compared to 2013).

#### Carbon Neutrality Strategic Roadmap



#### Four Strategies of the Carbon Neutrality Strategic Roadmap



We drafted our fifth 5-Year Environmental Action Plan to help realize the NGK Group Environmental Vision. This plan outlines targets for the environmental activities we will conduct between FY2021 and FY2025.

The objective of this Plan is to make it easy to understand our progress towards net zero by 2050 and our 2030

milestone target of a 50% reduction compared to 2013. As part of our initiatives to expand our use of renewable energy, we set new targets for renewable energy utilization rates that we apply to electricity consumption for the entire Group. We also set targets to increase the number of products registered as carbon neutral-related products.



LINK

NGK Group Environmental Policy, Environmental Vision  
<https://www.ngk-insulators.com/en/sustainability/environment-vision.html>

5-Year Environmental Action Plan  
<https://www.ngk-insulators.com/en/sustainability/environment-plan.html>



CO<sub>2</sub> emissions (ESG data)  
<https://www.ngk-insulators.com/en/sustainability/data.html>





Particularly Important Risks and Opportunities

(1) Carbon Neutral Society Transition Risks and Opportunities (1.5°C scenario)

Category	Summary of assumed scenario	Business risks & opportunities		Details of risks & opportunities		Timeframe	Response strategy	Financial impacts
Policy/ Legal	<ul style="list-style-type: none"><li>• Rapid reduction in emissions required to achieve carbon neutral by 2050.</li><li>• Adoption of carbon pricing against CO<sub>2</sub> emissions of our company or our supply chain. 2030: 130\$/t- CO<sub>2</sub> 2050: 250\$/t- CO<sub>2</sub></li></ul>	Increased cost of responses to further reduce greenhouse gas emissions	Risks	Incurring response costs related to equipment replacement and upgrades for energy saving, renewable energy procurement, electrification of energy sources, and energy conversion from natural gas as a furnace fuel to fuels sources such as hydrogen or ammonia.		Short- to long-term	<ul style="list-style-type: none"><li>• Trend and prediction monitoring for the regulations and carbon pricing systems of various countries</li><li>• Promote enhanced energy saving, technological innovation, and initiatives toward expanding the use of renewable energy in line with the NGK Group Environmental Vision and Carbon Neutrality Strategic Roadmap</li><li>• Monitor supply status of fuels with low greenhouse gas emissions</li><li>• Promote greenhouse gas emissions reductions in accordance with Supply-Chain CSR Guideline</li><li>• Expand Scope 3 calculations and range of disclosure, conduct life cycle assessments (LCA) for major products to identify reduction targets</li></ul>	Financial impacts of energy conversion/carbon pricing (increased expense) <sup>*1</sup> FY2025: -2.0 bil yen FY2030: -5.8 bil yen FY2050: -12.3 bil yen (Reference: Impacts of carbon pricing without reductions: -5.9 bil yen to -17.7 bil yen)
		Increased costs due to adoption of carbon pricing	Risks	Costs increase due to adoption of carbon pricing on company emissions and emissions along the upstream of our supply chain				
Technology	Growing battery demand leading to decline in prices for rechargeable lithium-ion and other batteries. Also seeing the emergence and adoption of new battery technology with high added value.	Risks and opportunities associated with battery technology innovation and the emergence/adoption of new technology	Opportunities	<ul style="list-style-type: none"><li>• Increased competitiveness by advancing proprietary technology development</li><li>• Increased storage battery needs</li></ul>		Medium- to long-term	<ul style="list-style-type: none"><li>• Monitoring of trends in technology innovation</li><li>• R&amp;D advancement</li></ul>	We are currently carrying out qualitative studies due to the lack of quantitative indicators.
			Risks	Competitiveness of our technologies will decline as competitors advance proprietary technology development				
	Rapid growth in CO <sub>2</sub> capture volume in various sectors, including fuel production, power generation, and industry.	Market growth driven by widespread adoption of CCU/CCS (CO <sub>2</sub> capture, utilization, and storage)	Opportunities	Growth in CCU/CCS market will increase business opportunities for our ceramic products (sub-nano ceramic membranes, etc.)		Medium- to long-term	<ul style="list-style-type: none"><li>• Monitoring of technology innovation and market trends</li><li>• Business expansion in the CCU/CCS market, new product development promotion marketing, business schemes, promotion of New Value 1000 to accelerate new product development</li><li>• Research, development, and provision of subnano-ceramic membranes, solid oxide electrolysis cells (SOEC), and the establishment of carbon cycles to use them.</li></ul>	Financial impacts of CCUS-related products <sup>*2</sup> FY2025: +0 bil yen FY2030: +14 bil yen FY2050: +270 bil yen
Market	<ul style="list-style-type: none"><li>• In the short-term, vehicle emissions restrictions will be stricter, increasing demand for improved fuel economy.</li><li>• In the medium- to long term, the proportion of electric vehicles (EVs ) and fuel cell vehicles (FCVs) in automobile sales will rise rapidly, and the proportion of internal combustion engine vehicles will decline.</li></ul>	Changes in demand for automotive parts	Opportunities	<ul style="list-style-type: none"><li>• In the short term, demand for catalyst substrates for controlling automotive emissions and NOx sensors will increase due to stricter exhaust gas regulations.</li><li>• In the medium- to long-term, demand for gallium nitride (GaN) wafers, DCB and AMB substrates, and beryllium copper alloy for EVs will increase.</li></ul>		Short- to long-term	<ul style="list-style-type: none"><li>• Monitoring of regulatory, market, and demand trends</li><li>• Plan and implement production and capital expenditures in response to the plans of automobile manufacturers</li><li>• Cover decline in demand for internal combustion engine vehicles due to tougher exhaust gas regulations by increasing the number of new products and high-performance products</li><li>• Expand adoption of gallium nitride (GaN) wafers, beryllium copper alloy, and DCB and AMB substrates for EVs and plug-in hybrid vehicles (PHEVs)</li><li>• Develop and offer products for heat management in EVs, new products for synthetic fuels, etc.</li></ul>	Financial impacts of automotive-related products <sup>*2</sup> FY2025: +65 bil yen FY2030: -50 bil yen FY2050: -244 bil yen
			Risks	Demand for products for internal combustion engine vehicles will decline over the medium- to long-term				
	The capacity of power storage batteries and demand for lithium-ion rechargeable batteries for EVs will rapidly expand.	Increased storage battery demand	Opportunities	<ul style="list-style-type: none"><li>• Increased demand for NAS<sup>®</sup> batteries and Zinc Rechargeable Batteries</li><li>• Increased business opportunities in the heating and refractory business for lithium-ion rechargeable batteries</li></ul>		Short- to long-term	<ul style="list-style-type: none"><li>• Monitoring of power policies and customer trends in each country</li><li>• Enhance production systems in response to growing demand</li><li>• Provide new value through solutions services</li><li>• Commercialize Zinc Rechargeable Batteries</li></ul>	Financial impacts of battery-related products <sup>*2</sup> FY2025: +23 bil yen FY2030: +33 bil yen FY2050: +68 bil yen
	Demand for semiconductors will increase with electrification in various fields such as industry and transportation.	Growth in demand for semiconductor-related products	Opportunities	Increased demand for parts for semiconductor manufacturing equipment and electronic parts/metals in the digital society business		Short- to long-term	<ul style="list-style-type: none"><li>• Monitoring of demand trends</li><li>• Enhance production systems in response to growing demand</li><li>• Partner with semiconductor manufacturing equipment manufacturers, increase facility capacity, personnel, facility systems, etc. as necessary</li></ul>	We are currently carrying out qualitative studies due to the lack of quantitative indicators.
Reputation	<ul style="list-style-type: none"><li>• Regular and growing trend of investors and financial institutions factoring climate change risk into investment decisions and requiring lenders to set SBT<sup>*3</sup>.</li><li>• Customers are increasingly demanding renewable energy adoption and reductions in CO<sub>2</sub> emissions.</li></ul>	Improving assessments by contributing to carbon neutrality	Opportunities	Assessments by stakeholders can be improved by proactively responding to climate change and providing products and services that contribute to carbon neutrality.		Short- to long-term	<ul style="list-style-type: none"><li>• Business structure conversion, one of the goals outlined in the NGK Group Vision</li><li>• Promote measures to reduce greenhouse gas emissions</li><li>• Conduct information disclosure in line with the TCFD framework</li><li>• Ascertain customer demands and implement responses accordingly</li></ul>	We are currently carrying out qualitative studies due to the lack of quantitative indicators.
		Decline in trust from stakeholders due to delays in responding to climate change	Risks	Delays in climate change measures will have a negative impact on brand, capital procurement, transactions, etc.				

(2) Physical Risks and Opportunities Associated with Advancing Climate Change (mainly 4°C scenario)

Category	Summary of assumed scenario	Business risks & opportunities		Details of risks & opportunities		Timeframe	Response strategy	Financial impacts
Acute	<ul style="list-style-type: none"><li>• Frequency of flooding increasing in regions such as Japan and Asia.</li><li>• The frequency of violent typhoons increasing.</li></ul>	Impact of wind and flood damage on factories and supply chains	Risks	<ul style="list-style-type: none"><li>• Increasing impact of factors such as property damage to facilities and machinery caused by wind and flooding, profit losses due to the suspension of business, and difficulty in employees coming to work.</li><li>• Supply chain disruption due to increased wind and flood damage</li></ul>		Short- to long-term	<ul style="list-style-type: none"><li>• Flood risk assessments for major sites including future climate</li><li>• Create and promote BCP (Business Continuity Plan), including for supply chains</li><li>• Create a structure that enables global substitutions by decentralizing sites</li><li>• Prepare for supply chain disruption by evaluating alternative procurement methods in advance (focus on production areas with high disaster risks)</li><li>• Evaluate the flood risk assessments of major suppliers</li></ul>	Changes in our company's financial impacts (expected value) due to floods and storm surges affecting our plants and suppliers <sup>*4</sup> Currently 3.1 bil yen FY2025: -70 mil yen FY2030: -100 mil yen FY2050: -540 mil yen
Chronic	Sea levels continue to rise.	Impact of storm surge on coastal factories	Risks	<ul style="list-style-type: none"><li>• Increased storm surge risk, increased property damage and profit losses due to flood damage</li><li>• Costs incurred for measures such as height elevation and barriers and relocation</li></ul>		Medium- to long-term		

<sup>\*1</sup> We set certain assumptions and premises about things like future business expansion based on the parameters (carbon price, energy unit price, power source mix, etc.) of scenarios in the International Energy Agency (IEA) Net Zero by 2050 report (2021 edition). Then we combined the costs of energy conversion and energy saving with carbon prices for greenhouse gases to calculate the amount of financial impact on profits.

<sup>\*2</sup> We used certain assumptions and premises to estimate our market share based on changes in the automobile, CCU/CCS, and battery markets according to scenarios in the International Energy Agency (IEA) Net Zero by 2050 report (2021 edition). We then estimated the impact on sales of some products compared to the present to determine financial impacts.

<sup>\*3</sup> SBT: Abbreviation of Science-based Targets, which is an initiative that requires companies to set targets for reducing greenhouse gas emissions based on scientific evidence.

<sup>\*4</sup> Drawing on location information for our plants and major suppliers, we used a simulation that employed the Climate Score Global (CSG) model developed by Jupiter Intelligence in the United States to evaluate the inundation depths caused by flooded rivers and storm surges at a resolution of 90m. Based on this evaluation, we calculated the expected amount of financial impact on profits by tallying up the value of losses to our company due to asset losses at our plants and losses due to shutdown of our plants and major suppliers. This expected value is an index calculated from the amount of losses due to floods and the probability of flood occurrence in a given year. The loss amount is estimated based on a uniform damage rate according to depth of inundation and does not reflect the disaster preparedness measures in place in the areas where sites are located.

Biodiversity

Information Disclosure Based on TNFD Recommendations

Our society and its economic activities depend on nature and its blessings. But nature is said to be in rapid decline worldwide. Amidst a growing sense of urgency and awareness of the importance of restoring nature, the Kunming-Montreal Global Biodiversity Framework (GBF) was adopted at the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity (COP15) in 2022. It sets a common global goal of being nature positive, which means taking action to stop and reverse the loss of biodiversity by 2030.

Since nature-related issues may have an impact on the NGK Group's business activities themselves, we believe that it is important to ascertain how our business relies on nature

throughout our entire value chain, and what kind of impact our business is having on nature. In the NGK Group Environmental Vision, we set the idea of harmony with nature as one of our most important issues. And NGK aims to operate in harmony with nature by minimizing its environmental impact on ecosystems and raising awareness among each and every employee through awareness-raising activities.

Also, in January 2024, the NGK Group declared that we would begin early disclosure as a TNFD Early Adopter\*1.

\*1 Companies and organizations that will begin information disclosure by FY2025 (As of January 2024: 320 companies in 46 countries, 80 of them Japanese)

Objectives of Disclosure

Through proactive TNFD disclosure, NGK will make clear the interface between the NGK Group's business activities and nature, ascertain the importance of our dependencies and impacts on nature, as well as related risks and opportunities, and meet the expectations of society and stakeholders. In

addition, through disclosure the entire Group will promote nature-related initiatives, which will help to achieve the goal of coexistence with nature espoused in the NGK Group Environmental Vision and bring about a sustainable society.

Ascertaining Points of Contact with Nature at NGK Group Production Sites

We evaluated the points of contact with nature for the NGK Group's production sites. In our evaluation, we used a variety of data on the importance of biodiversity and the integrity of ecosystems\*2. This includes big data on biodiversity based on the academic expertise of Think Nature Inc. Concerning

physical risks for water, we also used databases related to water risks, pollution, etc.

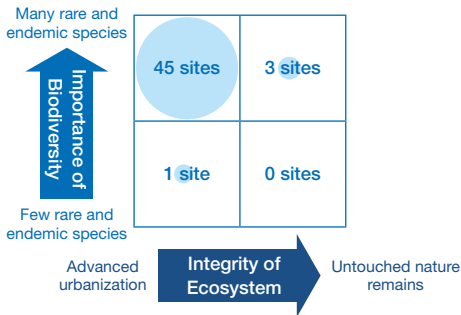
\*2 This is an indicator of ecosystem health, and it can be said that areas with advanced urbanization have low ecological integrity.

● Results of Evaluation of Importance of Biodiversity and Integrity of Ecosystems

The NGK Group evaluated the importance of biodiversity and integrity of ecosystems at 49 of our production sites in Japan and around the world. As the figure on the right shows, many of our production sites are in areas where biodiversity is very important (areas with many rare and endemic organisms) and areas where the integrity of the ecosystem is low (areas with a high degree of ecosystem loss). In addition, you can see that some sites are in protected areas (IUCN Category IV: Habitat/Species Management Areas\*3) or within a 500-meter radius of areas that are important to biodiversity. We work to prevent environmental pollution and improve environmental conservation by ensuring NGK and relevant sites abide by environmental laws and other requirements, and by instituting our own voluntary standards. Going forward, we will select several sites on a priority basis for detailed analysis, taking

into account the results of this survey and business details of each site.

\*3 Categories of protected areas aimed at protecting and restoring important plants, animals, and habitats at global, national, and regional levels.



● Physical Water Risks

In the same way, we evaluated 49 NGK Group production sites inside and outside Japan. The results confirmed that there were no high-risk sites in terms of water pollution. On the other hand, it was found that some sites were high-risk in

terms of the risk of water-related disaster and water stress. Based on these results, we will select several sites for detailed analysis in the future.

Overview of Nature-Related Risks and Opportunities

We referenced the risk classification in the TNFD recommendations, and confirmed the specific risks and opportunities currently expected based on the primary

nature-related dependencies and impacts for the entire NGK Group. First, the table below shows the primary nature-related dependencies, negative impacts and risks expected at present.

Primary Nature-Related Dependencies, Negative Impacts, and Risks

Risk Category		Primary Dependencies and Negative Impacts	Risks
Physical Risks	Acute/Chronic	• Dependence on water resources for raw material extraction and manufacturing processes	• Water shortages due to excessive water withdrawal and climate change
		• Dependence on climate regulation, disaster mitigation, and soil stability	• Disasters due to decline in climate regulation, disaster mitigation, and soil stabilization capacity
Transitional Risks	Policy	• Dependence on natural resources	• Increasing prices due to restrictions on resource extraction and land changes
		• Land changes due to raw material extraction	• Increasing water prices due to restrictions on water withdrawal
		• Water use	• Increased handling costs due to strengthening of obligations for information disclosure regarding pollutant emissions, water, and raw materials
	Market	• Emissions of pollutants	• Increasing prices of sustainable raw materials (recycled materials, certified materials, etc.)
	Reputation/Liability	• Water pollution	• Deteriorating reputation and decline in sales due to generation of pollution and water pollution, and excessive water use
		• Factory land use	• Increasing costs due to legal claims such as fines
		• Emissions of pollutants	
		• Water use	

Nature-Related Positive Impacts from NGK Group Products

Business Details		Products	Positive Impacts on Nature					
			Climate change	Land use changes	Resource use	Contamination/Decontamination		
			Greenhouse gas emissions	Terrestrial ecosystem use	Other resource use	Waste	Air pollution other than greenhouse gases	Soil pollution
Environment Business Group	Automotive Ceramics Business	Ceramics for exhaust gas purification		●	●	●	●	●
		NOx sensors		●	●	●	●	●
	Industrial Process Business	Industrial heating systems, Refractory products	●	●	●	●		
		Membrane separating systems	●			●		●
		High-temperature dust collector		●	●	●	●	
Digital Society Business Group	HPC Business	Low-level radioactive waste treatment units	●			●	●	
		Ceramics for semiconductor manufacturing equipment				●		
	Electronic Devices Business	EnerCera® battery	●		●	●		
	PEC Business	AMB and DCB substrates	●			●		
	Special Metals and Mold Business	Special metals and mold products	●		●	●		
Energy & Industry Business Group	Energy Storage Business	NAS® batteries	●	●	●	●		
	Insulator Business	Insulators	●	●	●	●		

Future Initiatives

Moving forward, the NGK Group will reassess our dependence and impact on nature as well as our risks and opportunities related to nature. This assessment will be based on the characteristics of our business operations and production facilities combined with the objective results of our recent evaluation. In particular, the assessment of our dependence and impact on nature will focus on whether or not our actual use of water resources and land use causes an environmental impact. On the subject of the connection between production facilities and nature, we will carefully

examine the actual impact our operating activities have on nature. In addition to these detailed surveys, we will also enhance four pillars of information as we prepare to provide information disclosure for 14 categories based on TNFD recommendations in FY2025.



Response to TNFD  
<https://www.ngk-insulators.com/en/sustainability/environment-tnfd.html>





## Respect for Human Rights

### Basic Approach

Concerning respect for human rights within NGK Group business activities, our relationship with employees has been governed by the NGK Group Corporate Business Principles, and our relationship with suppliers has been governed by the NGK Group Supplier Code of Conduct. In April 2021 we

established the NGK Group Human Rights Policy as a separate policy on human rights. This not only clarifies our messaging both inside and outside of NGK, but accelerates our efforts to respect human rights.

#### Related Policies and Approaches



NGK Group Human Rights Policy  
<https://www.ngk-insulators.com/en/info/policies/humanrights.html>



NGK Group Corporate Business Principles and Code of Conduct  
<https://www.ngk-insulators.com/en/info/coc/>



NGK Group Supplier Code of Conduct  
[https://www.ngk-insulators.com/en/resource/pdf/info/supplier\\_coc\\_en.pdf](https://www.ngk-insulators.com/en/resource/pdf/info/supplier_coc_en.pdf)



Statement on the UK Modern Slavery Act  
<https://www.ngk-insulators.com/en/info/policies/msa.html>



Respect for Human Rights  
Respect for the Human Rights of Children  
Compliance with Local Labor Laws  
<https://www.ngk-insulators.com/en/sustainability/society-humanrights.html>



### Management System

In April 2020, we established the HR Committee as a cross-sectoral, deliberative body chaired by the Director responsible for the Human Resources Department and tasked with ensuring that corporate activities have a stronger focus on human rights and that important personnel issues are addressed by the NGK Group as a whole.

Two committees work to promote initiatives that ensure respect for human rights. For the NGK Group this is the HR

Committee, and for our supply chain it is the Supply Chain Subcommittee of the ESG Management Committee. These committees coordinate and cooperate with related committees and departments on such initiatives, according to their content and importance. Meanwhile, the managing director of the HR department regularly reports to the Board of Directors concerning the status of their implementation, and the Board of Directors overseas the status of implementation.

#### ● NGK Group Supplier Code of Conduct

The NGK Group requests that all Group suppliers reinforce respect for human rights along the supply chain in accordance with the NGK Group Supplier Code of Conduct. Please see Promotion of Sustainable Procurement for details.



Supply Chain Management  
<https://www.ngk-insulators.com/en/sustainability/society-scm.html>

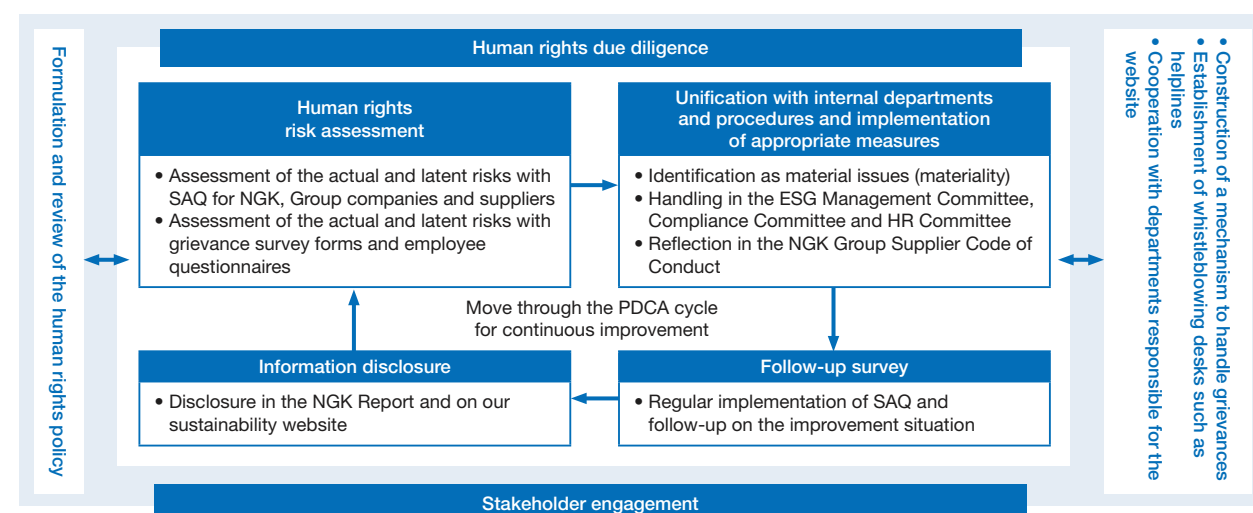


NGK Group Supplier Code of Conduct  
[https://www.ngk-insulators.com/en/resource/pdf/info/supplier\\_coc\\_en.pdf](https://www.ngk-insulators.com/en/resource/pdf/info/supplier_coc_en.pdf)



Promotion of Sustainable Procurement → P.57-58

### Overall Picture of Initiatives for Respect for Human Rights



### Human Rights Due Diligence

#### ● Human Rights Risks Accompanying Group Business Activities

NGK regularly conducts a self-assessment survey based on the RBA\* Code of Conduct on ourselves and our Group companies in and outside of Japan. In FY2023, a total of 40 companies including NGK underwent the self-assessment survey with a total of 55 questions in the three categories of labor, health and safety, and ethics.

As a result, no violations of the laws or regulations of each country were found. On the other hand, we confirmed

multiple instances of issues which, while legal, do not comply with the RBA Code of Conduct. We recognize that these are human rights issues requiring our attention. Based on that, we will consider our response while taking into account the laws/ordinances, customs and practices of each country.

\*Responsible Business Alliance: Focusing primarily on the electronic equipment industry, the RBA establishes standards and conducts audits with the aim of promoting safe working environments, worker protection, and environmental responsibility.

#### ● Human Rights Risks to Employees

Concerning human rights risks to employees, we accept reports and queries about human rights through our internal whistleblowing desk, and receive reports from Group companies once every 6 months through the Human Rights Grievance Survey or the Legal Risk Management Report. In

FY2023, we received 27 reports related to human rights from the entire NGK Group. We are handling these with fact-finding investigations, rectification, instruction, and warnings. Once every two years we also conduct a Corporate Risk Survey (CRS) to identify latent risks.

#### ● Human Rights Risks to Supply Chain

Promotion of Sustainable Procurement → P.57-58

### Grievance Mechanisms

NGK has established a whistleblowing desk (helpline) which can be used by all officers and employees of NGK and our Group companies in Japan. In addition to enabling anonymous consultations and whistleblowing, we work to protect employees from disadvantageous treatment due to having sought out consultation concerning whistleblowing or engaged in whistleblowing. At overseas Group companies, we have established effective whistleblowing systems that are made available to all officers and employees. This includes consultation and whistleblowing mechanisms structured to suit the conditions of each country. For example, our Group companies are establishing mechanisms to receive inquiries and reports which can be used by all officers and employees to suit the actual circumstances in their countries.

Moreover, we have established the Supplier Helpline to accept inquiries and reports from suppliers. Together with this, we are capable of receiving inquiries and reports from all our stakeholders through the Contact page on the NGK website.

When we receive an inquiry or report relating to human rights, the Human Resources Department provides remedies for the affected parties if we confirm human rights have been affected upon discussions with the Group Compliance Department and other related departments. Depending on the severity of the consultation or whistleblowing, reports are then issued to the Compliance Committee, HR Committee, and ESG Management Committee.



Whistleblowing system  
<https://www.ngk-insulators.com/en/sustainability/governance-compliance-structure.html#sec04>



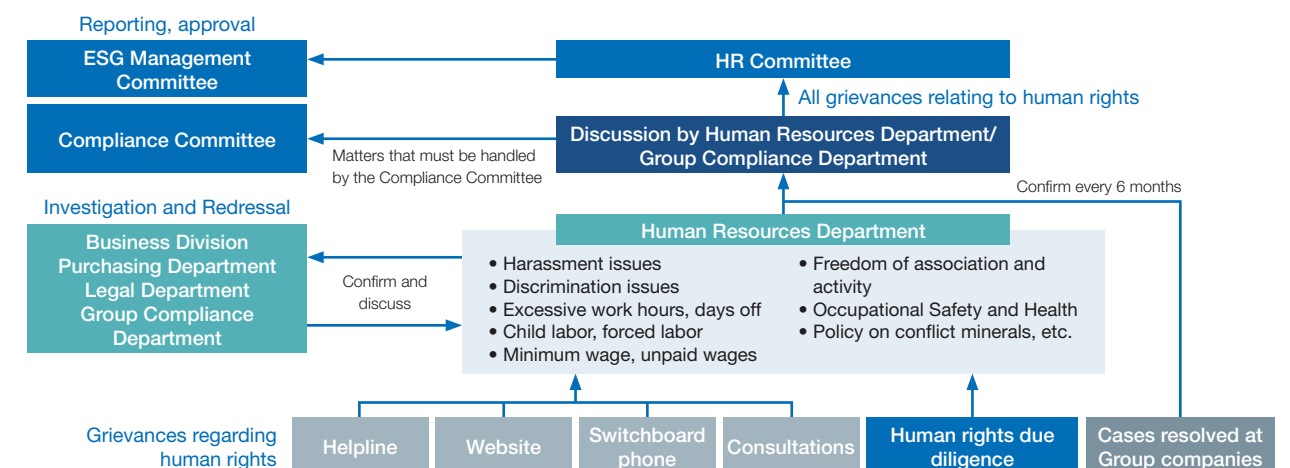
Supplier Helpline  
<https://www.ngk-insulators.com/en/info/procure/helpline.html>



Contact Page on the NGK Website  
<https://www.ngk-insulators.com/en/contact/>



### System for Responding to Grievances and Correction/Redressal



Promotion of Sustainable Procurement

Basic Approach

Our policy hinges on the three principles of Open and Fair, Partnership, and Relationship with Society. In line with this, the NGK Group has established a policy for promoting fair and honest business transactions and helping to ensure prosperous relationships with the suppliers in our supply chain.

In March 2024, we revised our basic purchasing policy into the NGK Group Procurement Policy to codify the details more specifically on its initiatives, while maintaining its existing principles.

In 2021 we submitted a Declaration of Partnership Building as advanced by the Cabinet Office Small and Medium Enterprise Agency. We continue to promote partnership with our suppliers as well as fair and honest dealing.



NGK Group Procurement Policy  
<https://www.ngk-insulators.com/en/info/policies/#procurement>



Promoting CSR Procurement

In response to growing societal demands for CSR in the supply chain, the NGK Group is promoting CSR procurement and sustainable procurement. We select suppliers which

have CSR initiatives and ESG Management. And we procure materials and services which consider environmental and social impacts.

● Supplier Code of Conduct

In FY2010, the NGK Group established the NGK Group's Supply-Chain CSR Procurement Guidelines which cover the entire Group.

Thereafter, we added items based on societal changes and new global issues, and in July 2024, we conducted a complete review of the contents and reworked it into the NGK Group Supplier Code of Conduct.

We periodically ask our major suppliers to comply with

this code of conduct when starting new projects or continuing current ones.



NGK Group Supplier Code of Conduct  
[https://www.ngk-insulators.com/en/resource/pdf/info/supplier\\_coc\\_en.pdf](https://www.ngk-insulators.com/en/resource/pdf/info/supplier_coc_en.pdf)



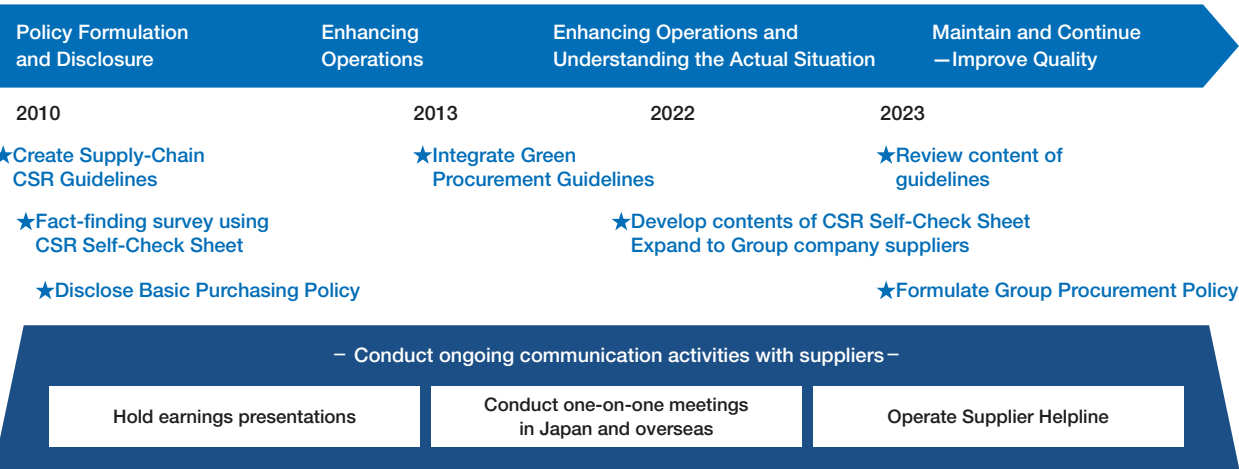
● Enhancement of Group-Wide Cooperation and Procurement Capabilities

Within the NGK Group, we work to strengthen the procurement capabilities and ensure good governance for the Group as a whole through a number of approaches, including sharing information among Group companies and undertaking joint initiatives aimed at various procurement matters. Based on each company's purchasing system and transaction situation, we clarify issues and provide support and reinforcement, such as collective purchasing of common

materials, sharing cost and supplier information, and introducing domestic supplier management methods to Group companies.

We will continue expanding the use of collective purchasing, standardizing supplier management methods, and developing other approaches that will contribute to improved procurement functions Group-wide, both in terms of cost and governance.

History of CSR Procurement



Supplier Assessment

● Identifying Important Suppliers

Within NGK, we identify important suppliers from the following point of view.

- Handling of important items: Raw materials and molding molds for main production items\* are considered critical items
- Transaction volume: Accounts for 80% or more of raw materials and molds supply for main production items

- BCP: single company supply ratio of 70% or more  
As of March 2024, 38 companies (22 Tier 1 companies, 16 Tier 2 companies) are considered important suppliers.

\*Main production items: ceramics for purifying automobile exhaust, insulators and related devices for electric power, ceramics for electronic and electrical devices and ceramics for semiconductor manufacturing equipment

● Existing Supplier Assessment

At NGK, we periodically ask existing suppliers to submit written consent to comply with our NGK Supplier Code of Conduct. And since 2021 we have conducted fact-finding surveys consisting of 114 questions on nine topics, including human rights, labor, and the environment. This allows us to perform a detailed CSR assessment of each supplier and

assess risk according to transaction details. From the perspective of impact on our business, we first conducted these surveys for direct suppliers of NGK. Then we gradually expanded them to the main suppliers of our Group companies in Japan, and in FY2023, to the 66 main suppliers of our Group companies overseas.

Main SAQ Items

Main Items	Details
Corporate Governance	Promotion framework, internal control, BCP framework, internal whistleblower system, information dissemination both internally and externally
Human Rights/Labor	Basic stance; respect for human rights; prohibition and prevention of discrimination/violation; provision of equal opportunities for hiring, training, and career advancement; fair wages, fair implementation of hours and leave; prohibition of forced or child labor; health and safety/health management; freedom of association
Environment	Basic stance; chemical substance management; waste reduction; effective resource utilization (water recycling, raw materials recycling) and preservation; prevention of global warming; biodiversity
Fair Business Practices	Basic stance; appropriate relationship with government and public officials; preventing inappropriate sharing of benefits with related parties; preventing violations of competition law; elimination of relationships with anti-social organizations; protecting intellectual property and copyrights; relief system; prohibition of insider trading and conflict of interest
Quality/Safety	Basic stance; ensuring quality and safety of products and services; appropriate handling of accidents and defective products
Information Security	Basic stance; defending against cyber threats; protecting individual data and privacy; preventing unauthorized use of confidential information
Co-existence of Supply Chain with Local Communities	Basic stance; initiatives concerning conflict minerals; reducing negative influence on local society; initiatives in cooperation with local society towards sustainable development

Communication Activities with Procurement Partners

● Explanation of Earnings to Suppliers

In FY2023, NGK's annual earnings presentation for suppliers, which had been conducted online because of the risks posed by the COVID-19 pandemic, was held in-person for the first time in four years. We explained our earnings and materials procurement policy to 117 supplier companies participating

on-site (and 80 companies participating online). We also asked for their continued compliance with CSR procurement, and shared information and goals meant to facilitate the continuation and expansion of business throughout our entire supply chain.

● Visiting and Monitoring Individual Suppliers in Japan and Overseas

In order to ensure procurement from the most appropriate suppliers, NGK visits individual suppliers in Japan and overseas to conduct on-site audits and evaluate their QCD

(quality, cost, and delivery) performance in a fair and equitable manner. In FY2023, we conducted quality audits at 41 of our existing suppliers, including 20 of our most important suppliers.

Procuring Resources and Raw Materials Responsibly

The NGK Group conducts procurement activities that consider impacts on regional communities stemming from the use of raw materials (e.g. conflict minerals) with the potential to cause social issues such as human rights

violations and poverty, and takes steps to avoid using such materials. Additionally, in response to requests from customers, we investigate suppliers regarding their responsible procurement of resources and raw materials.




Dialogue with Stakeholders


A corporation engaging in business activities will face numerous social issues, including issues related to the environment and human rights. We believe it is critical that we strive to resolve such issues and aim for sustainable development. Guided by the NGK Group Corporate Business Principles, we take all stakeholder feedback seriously and work to fulfill our duty of accountability.

NGK Group Stakeholders

The NGK Group works to promote an understanding of our Group among customers, suppliers, shareholders/investors, local communities, governments/international organizations, universities/research institutes, and employees. Through dialogue with all our stakeholders, we continuously work to improve our activities and initiatives.



NGK Group Corporate Business Principles and Code of Conduct  
<https://www.ngk-insulators.com/en/info/coc/>



LINK



Response to Stakeholders

Stakeholders	Approach	Communication (objectives)	Communication (methods)
Customers	To earn and maintain the trust of customers, we engage in the creation of new value through the provision of products and services realizing global environmental conservation and social safety and peace of mind from a long-term and global perspective.	<ul style="list-style-type: none"><li>Enhancement of customer satisfaction</li><li>Quality improvement</li></ul>	<ul style="list-style-type: none"><li>Official website</li><li>Contact desk</li><li>Participation in exhibitions</li><li>Open innovation</li></ul>
Suppliers	With a basic policy centered on the three principles of Open and Fair, Partnership, and Relationship with Society, the NGK Group is engaged in fair, free, and transparent business transactions with the suppliers in our supply chain. We also established a supplier helpline to provide unwavering support for important inquiries in an effort to build and maintain fair supplier relationships.	<ul style="list-style-type: none"><li>Realize fair, free, and transparent transactions</li><li>Exchange information with suppliers</li><li>Establish better supply chain</li></ul>	<ul style="list-style-type: none"><li>Financial results presentations</li><li>Supplier helpline</li><li>Individual visits to suppliers in Japan and overseas</li></ul>
Shareholders and Investors	The NGK Group aims to meet expectations for improving enterprise value through dialogues and efforts to disclose information pertaining to management, finance, products, and services in a timely and appropriate manner.	<ul style="list-style-type: none"><li>Improving enterprise value</li></ul>	<ul style="list-style-type: none"><li>General Meeting of Shareholders</li><li>Financial results briefings</li><li>Individual visits and interviews</li><li>Participation in IR events</li><li>Responding to ESG investment</li><li>Official website</li></ul>
Employees	We will create the following kind of work environment as the stage upon which our personnel can demonstrate the abilities they possess. <ul style="list-style-type: none"><li>Diverse and Inclusive Workplace</li><li>Prosperous and Energetic Workplace</li><li>Open Workplace that encourages challenges</li></ul> We also support the growth of human resources and fair treatment enabling each employee to maximize their skills.	<ul style="list-style-type: none"><li>Respect for the human rights of employees</li><li>Development of safe and comfortable workplace environments</li><li>Conducting of surveys on workplace environment and employee satisfaction</li><li>Penetration of corporate philosophy and policies</li></ul>	<ul style="list-style-type: none"><li>Company newsletter</li><li>Global MIZUHO English-version company newsletter</li><li>In-house video newsletter</li><li>Intranet</li><li>Labor-Management Advisory Board meetings, regular Labor-Management Council meetings</li><li>Survey on workplace vitality</li><li>CRS (Corporate Risk Survey)</li><li>Helpline</li><li>Hotline</li></ul>
Local Communities	We proactively engage in social contribution activities in response to community needs with the intent of becoming a corporate citizen trusted by society with concern for social issues in all countries and regions where we do business.	<ul style="list-style-type: none"><li>Contribution to local communities as a trusted corporate citizen</li></ul>	<ul style="list-style-type: none"><li>Collaborative activities with NPOs, etc.</li><li>Volunteer activities by employees</li><li>Social contribution activities in cooperation with labor unions</li><li>Invitation to plant tours and events</li></ul>

Stakeholders	Approach	Communication (objectives)	Communication (methods)
Governments and International Organizations	We proactively participate in international initiatives and other activities in order to realize mutual cooperation as key actors seeking to resolve social issues.	<ul style="list-style-type: none"><li>Promotion of initiatives to resolve social issues</li></ul>	<ul style="list-style-type: none"><li>Participation in international initiatives</li></ul>
Universities and Research Institutes	Through research and educational activities based on industry-academia collaboration, we have been pushing forward with the development of scientific technologies and other technologies that will contribute to resolving social issues.	<ul style="list-style-type: none"><li>Development of scientific technologies</li><li>Development of technologies that will contribute to solving social issues</li></ul>	<ul style="list-style-type: none"><li>Joint research</li></ul>

Status of Dialogue with Shareholders and Investors (FY2023)

Format of dialogue and number of sessions

Financial results briefings	2 times
Small meetings in Japan (Institutional investors)	4 times
Individual meetings in Japan (institutional investors/analysts/ESG officers, voting officers)	133 meetings
Overseas IR (institutional investors)	3 times
Investment forum participation	1 time
Asset management briefings (individual investors)	2 times

Major dialogue themes

Management strategy and growth potential	<ul style="list-style-type: none"><li>Status of business portfolio shift</li><li>Future profit expectations for carbon neutrality-related products, which will lead to improvements in PER</li><li>Correlation between manufacturing facility and human capital investments and growth strategy</li><li>Enhance disclosure on intellectual property and intangible asset strategy</li></ul>
Individual businesses	<ul style="list-style-type: none"><li>Changes in demand trends and competitive environment for each business</li><li>Status of price revisions to reflect soaring costs</li><li>Business strategy for unprofitable businesses</li></ul>
Financial strategy	<ul style="list-style-type: none"><li>Our approach to shareholder capital cost adequacy</li><li>Further expand investments in promising businesses such as carbon neutrality to promote financial soundness</li><li>Approach to shareholder returns</li></ul>
Governance, etc.	<ul style="list-style-type: none"><li>Policy on maintaining cross-shareholdings</li><li>Analysis of yes/no voting ratio for agenda at the previous Ordinary General Meeting of Shareholders</li><li>Enhancing the number of Nomination and Compensation Advisory meetings and content of deliberations</li><li>Director selection linked to growth strategy and status of skills matrix confirmation</li><li>Increasing opportunities for sustainability briefings and dialogue with Outside Directors</li></ul>

Initiatives to improve management (reporting to Board of Directors and Executive Committee (twice/year))

- Measures for realizing the NGK Group Vision and their correlation to growth strategy. In particular, the formulation and disclosure of strategies related to the company-wide growth strategy for human capital, intellectual property, and intangible assets.
- Disclose results for financial metrics such as ROE and ROIC, and evaluate improvement measures
- Diversification and expansion of investor dialogue, including through sustainability briefings

Message from the Chairman of the Board of Directors



Chairman  
Taku Oshima

Pursue a highly effective Board of Directors with balanced decision-making and supervisory functions. Meet the expectations of our stakeholders by achieving medium- to long-term improvements in enterprise value.

Recent years have seen changes in our operating environment become increasingly complex. The Board of Directors face strong expectations, and are tasked with evaluating management strategy with greater focus on medium- to long-term perspectives while supporting improvements in enterprise value. Recognizing what is expected of us, in FY2023 the NGK Group Board of Directors evaluated and passed resolutions on several critical agenda related to improving enterprise value. One major success has been the progress made on discussions related to Group sustainability, including issues such as the environment, quality, safety, and human resources. We repeatedly exchanged opinions concerning the nine materialities we identified based on the NGK Group Basic Sustainability Policy. Through this process, the Group laid the groundwork for the approach we will apply towards realizing the NGK Group Vision. Under the core theme of “defining our vision of a sustainable company”, I feel that we have outlined a path for our Group.

In June 2024, with the approval of the General Meeting of Shareholders, the Board of Directors adopted a new member structure. Of the 10-member Board, we welcomed three female Directors to strengthen our diversity. We also increased the number of Outside Directors from three to four, thereby coming in compliance with the Governance Code parameter outlining that Outside Directors should comprise “at least one-third of all directors”. The biggest

role of the Outside Directors is to provide management advice from an independent and objective perspective. Our Outside Directors will fulfill a critical role for the NGK Group by helping ensure we engage in sound business management. The four Outside Directors have vast experience across their relative fields of expertise. I expect that they will serve as reliable advisors as we seek to promote growth and manage risks in the fields of carbon neutrality and digital society, which we position as domains towards which we will pivot future business.

To improve the efficacy of the Board of Directors, once a year we are evaluated by an external agency. Based on those results, we rapidly implement response measures to address indicated issues. Our most recent analysis and evaluation confirmed the efficacy of the Board. However, we are not satisfied with our current state, and will continue to pursue further improvements to efficacy moving forward.

Another important issue that we seek to address immediately is helping stakeholders better understand the NGK Group. I believe it is important that we enhance our information disclosure, not only to our shareholders and investors, but also for our employees and all other stakeholders. As Chairman of the Board of Directors, I will work to promote fairness and transparency that serves the interests of our shareholders and all stakeholders, and I am committed to fulfilling my responsibilities as we continue to pursue a higher level of governance.

Corporate Governance

Basic Approach

NGK Group’s basic policy on corporate governance is to ensure legality in business activities and transparency in management. The NGK Group has established a structure that can respond swiftly to changes in the business environment and built and maintains shareholder-focused system to ensure fair management.

To put this policy into practice, NGK has chosen the governance structure of a company with an Audit & Supervisory Board. We have established a corporate governance system that increases the effectiveness of corporate governance through debate and deliberation on important matters. This was accomplished by establishing the Executive Committee, ESG Management Committee, Risk Management Committee and various other committees to support the president in making decisions, in addition to the General Meeting of Shareholders, Board of Directors, and Audit & Supervisory Board.

NGK recognizes the need for swift, optimal decision-making and execution to respond to changes in the business environment. We have therefore introduced an executive

officer system to segregate the management decision-making and supervisory function from the business execution function to clearly define the roles of and strengthen each function.

To strengthen the supervisory and oversight function of the Board of Directors, we have mandated reporting to Board of Directors from the key committees among committees that handle various risks surrounding NGK. To ensure that the objectives of the Corporate Governance Code are thoroughly implemented, we established the Nomination and Compensation Advisory Committee, Corporate Council, Conference of Outside Directors and Outside Audit & Supervisory Board Members, the Business Ethics Committee, and other committees.

In addition, we have established the NGK Group Corporate Business Principles and NGK Group Code of Conduct to stipulate how everyone working for the NGK Group should execute their jobs so that they abide by society’s laws and NGK Group’s Articles of Incorporation and comply with corporate ethics. All executives and employees are well versed in the code and are obligated to abide by it.

Steps Taken to Strengthen Corporate Governance

We continue to strengthen the corporate governance system. Enhancements include introducing an executive officer system to improve the management supervision and

monitoring functions and other functions, and to provide suggestions on all aspects of management.

April 1999	Established the NGK Corporate Business Principles
April 2003	Revised guidelines into the NGK Group Corporate Business Principles
June 2005	Introduced an executive officer system
	Introduced a stock option
	Introduced an outside officer system
July 2005	Established the CSR Committee
June 2010	Appointed independent officers
July 2011	Revised the NGK Group Corporate Business Principles
April 2015	Signed on to the UN Global Compact
June 2015	Established the Global Compliance Office
December 2015	Established the Nomination and Compensation Advisory Committee, Corporate Council, Conference of Outside Directors and Outside Audit & Supervisory Board Members, and Business Ethics Committee
June 2017	Appointed one additional outside director
October 2018	Appointed a Chief Compliance Officer
January 2019	Revised the NGK Group Corporate Business Principles

April 2019	Established the ESG Committee
April 2020	Established the Compliance Committee
	Established the HR Committee
April 2021	Formulated the NGK Group Vision
	Formulated the NGK Group Human Rights Policy
	Established the NGK Group Basic Guidelines for Compliance Activities
June 2021	Outside directors increased to 1/3rd of Board of Directors An Outside Director made the Chair of the Nomination and Compensation Advisory Committee
April 2022	Established the ESG Management Committee
June 2022	Introduced a Restricted Share Compensation Plan
April 2023	Established the Risk Management Committee
May 2023	Formulated the NGK Group Basic Sustainability Policy
July 2023	Revised the NGK Group Corporate Business Principles and established the NGK Group Code of Conduct
June 2024	Increased ratio of female directors to 30%



Corporate Governance Report  
[https://www.ngk-insulators.com/en/resource/pdf/sustainability/governance\\_en.pdf](https://www.ngk-insulators.com/en/resource/pdf/sustainability/governance_en.pdf)

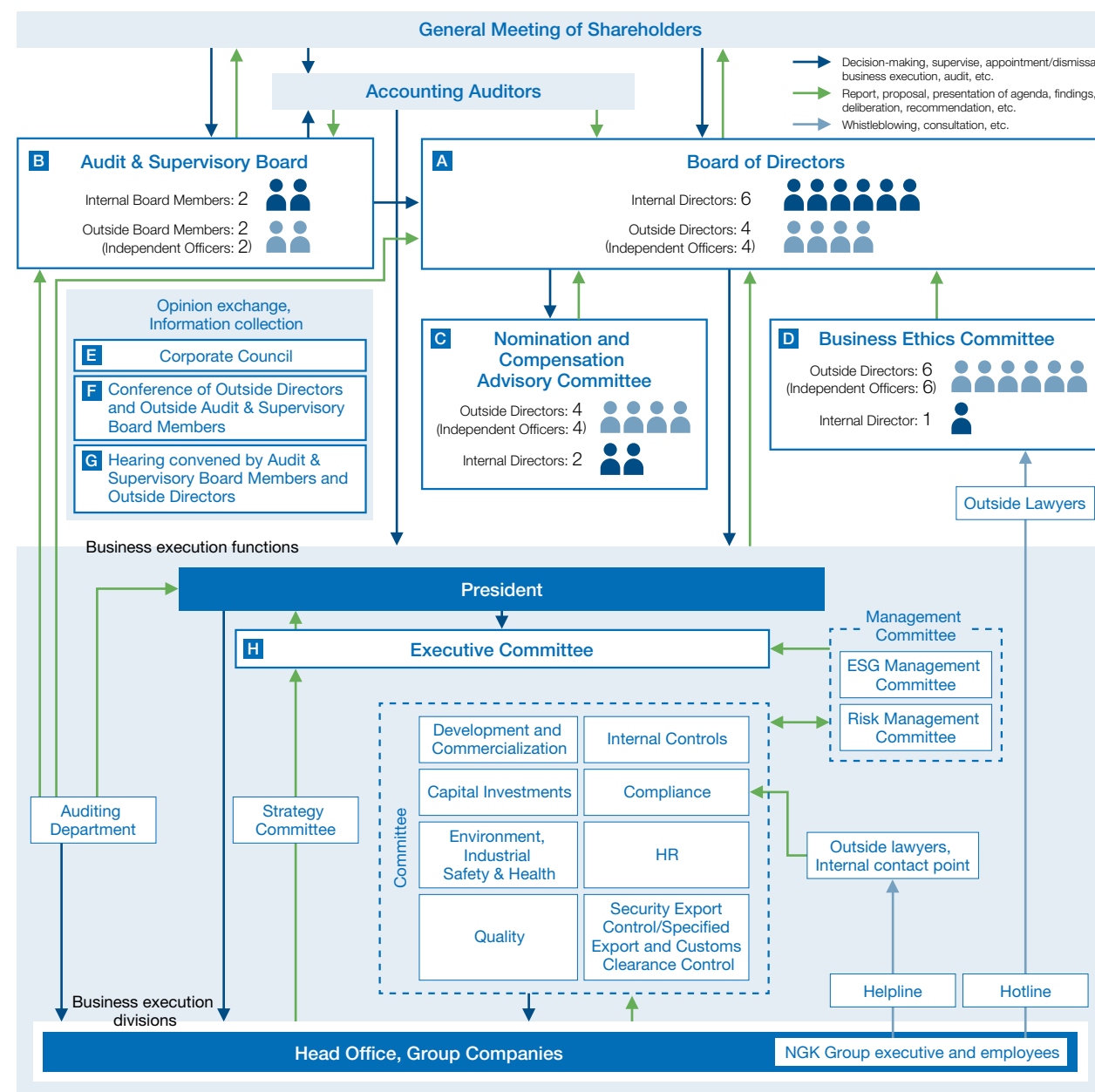




## Corporate Governance System

We have established the following system to ensure legality in business activities and transparency in management. This system makes it possible to respond swiftly to changes in the

business environment and maintains a shareholder-focused system to ensure fair management.



### Internal Control Systems

The NGK Board of Directors has established the following systems to ensure that directors comply with laws and regulations and NGK's Articles of Incorporation in the execution of their duties. This includes the systems deemed necessary to ensure the appropriateness of NGK's business operations as well as the operations of the NGK Group consisting of NGK and its subsidiaries. The business

execution organizational bodies that report to the President are responsible for operating these systems.



LINK

Basic Views on Internal Controls System and Status of Development  
<https://www.ngk-insulators.com/en/sustainability/pdf/governance-system.pdf>



### Roles of Major Bodies and Committees

#### A Board of Directors

Composition: 10 members (7 males, 3 females)

No. of meetings held in FY2023: 15

Comprised of one-third or more Outside Directors. The Board of Directors decides on mandated agenda items, such as matters outlined in the Companies Act and the Articles of Incorporation, and important matters related to business, and supervises business execution by Directors. The Chairman is Mr. Taku Oshima.

#### B Audit & Supervisory Board

Composition: 4 members (4 males)

No. of meetings held in FY2023: 14

Comprised of Audit & Supervisory Board members. Members attend Board of Directors' meetings to audit the decision-making process of Directors and the status of business execution. The Audit & Supervisory Board also confirms the status of the formation and implementation of a system of internal controls and confirms the adequacy of audit methods and results by the accounting auditor.

#### C Nomination and Compensation Advisory Committee

Composition: 6 members (4 males, 2 females)

No. of meetings held in FY2023: 4

Serving as an advisory committee to the Board of Directors, the Nomination and Compensation Advisory Committee was established to ensure fairness and increase transparency in personnel and compensation decisions concerning officers. The Committee is comprised of a majority of Independent Outside Directors, one of whom is chosen to serve as Committee Chair. To confirm the adequacy of deliberation processes, one Outside Audit & Supervisory Board member attends meetings as an observer. The Committee deliberates matters such as personnel decisions for Directors and Audit & Supervisory Board members, compensation for Directors and Executive Officers, the maximum total amount of compensation for Directors and Audit & Supervisory Board members, and CEO succession plans. The results of those deliberations are then reported to the Board of Directors.

#### D Business Ethics Committee

Composition: 7 members (4 males, 3 females)

No. of meetings held in FY2023: 5

Comprised of Outside Officers and full-time Directors in charge of compliance. This Committee conducts necessary

investigations into matters of fraud and legal violations involving NGK Officers. To ensure compliance with competition law and overseas anticorruption laws, the Committee evaluates the formation of a compliance structure and compliance activities. The results of these evaluations are then submitted to the Board of Directors as recommendations.

#### E Corporate Council

Composition: 12 members (9 males, 3 females)

No. of meetings held in FY2023: 2

Comprised of Outside Officers and Full-time Directors. Outside Officers provide recommendations to management concerning various issues related to business.

#### F Conference of Outside Directors and Outside Audit & Supervisory Board Members

Composition: 6 members (4 males, 2 females)

No. of meetings held in FY2023: 2

Comprised exclusively of Outside Officers. At these conferences, members exchange opinions concerning NGK management issues with the objective of making proactive contributions to deliberations by the Board of Directors.

#### G Audit & Supervisory Board Member and Outside Director Interviews

Composition: 8 members (6 males, 2 females)

No. of meetings held in FY2023: 13

Comprised of Audit & Supervisory Board Members and Outside Directors. Members conduct interviews to gather information on NGK's operating environment and issues from relevant internal personnel.

#### H Executive Committee

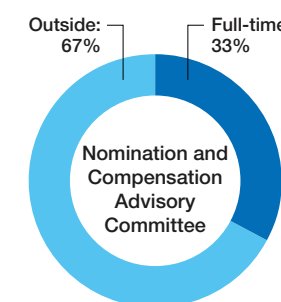
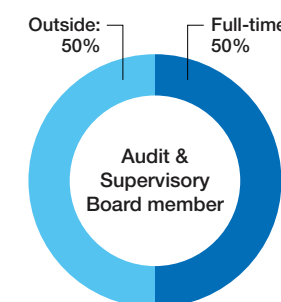
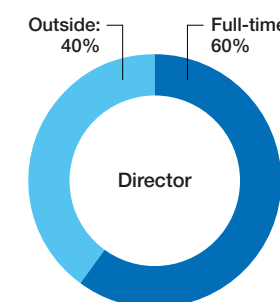
Composition: 16 members (15 males, 1 female)

No. of meetings held in FY2023: 20

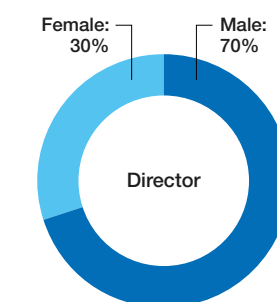
Comprised of the President, Vice President, various Business Group Executives, the Group Executives of Corporate NV Creation, Corporate R&D, and Corporate Manufacturing Engineering, the Directors responsible for each division, Full-time Audit & Supervisory Board members, and executive officers, committee chairs, business division general managers, and general managers designated by the President. This Committee deliberates on various matters to assist the President's decision-making. The Chairman is President Shigeru Kobayashi.

### Member Composition of the Board of Directors and Audit & Supervisory Board

#### Ratio of Outside Directors



#### Ratio of females



➤ Activities of Board of Directors

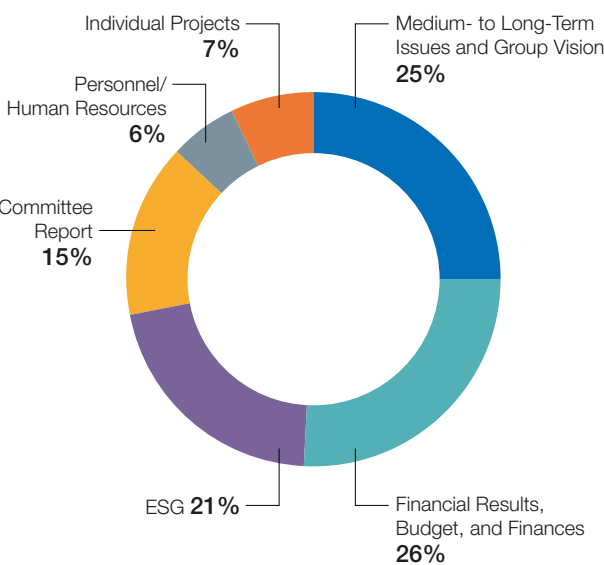
The Board of Directors is composed of ten directors (seven males, three females; one-third or more of directors are outside directors). It discusses and votes on matters designated under the Companies Act, NGK's Articles of Incorporation and Rules for the Board of Directors (These matters include company-wide unified budgeting, strategic planning such as dissolution, mergers, and alliances of the company, appointing and dismissing representative directors, and authorizing business

reports and financial statements etc., the disposal and acceptance of transfer of important assets, the appointment and removal of important employees, etc.). The Board also monitors the job performance of all company directors. The chair of the Board of Directors is a non-executive director. In addition, both the full-time and outside members of the Audit & Supervisory Board attend meetings of the Board of Directors and provide their opinions when necessary.

Main Agenda Deliberated in FY2023

- Medium- to Long-Term Issues and Group Vision
  - Identifying materiality
  - Initiatives for creation of new business (Progress report on New Value 1000)
  - Initiatives for business portfolio
  - Intellectual property strategy
- Financial Results, Budget, and Finances
  - Budget and financial results
  - Sale of long-term shareholdings
  - Report on IR/SR activities, etc.
- Environmental, Social, Governance (ESG)
  - Formulation of NGK Group Basic Sustainability Policy
  - Progress report on the 5th Five-Year Environmental Action Plan
  - Information disclosure based on TCFD
  - Formulation of Anti-trust law compliance program
- Committee Report
  - Report on major committee activities
- Personnel/Human Resources
  - Organization and personnel
  - Formulation of NGK Group Human Capital Management Policy
- Individual Projects
  - Investment in production facilities, R&D, etc.
  - Revision of company regulations

Time Allocated to Key Topics



➤ Analysis and Evaluation Results concerning the Effectiveness of Board of Directors

NGK's Board of Directors conducts a survey of directors and Audit & Supervisory Board members at the close of each fiscal year to evaluate the effectiveness of Board of Directors meetings. The Board entrusts analysis and evaluation of the responses to an external organization, which reports the

results to the Board of Directors. NGK continually strives to improve effectiveness through such means as considering the importance and necessity of each issue identified and reinforcing efforts in Board of Directors meetings during the next fiscal year.

● Policies and Main Initiatives in FY 2023 in Light of the Effectiveness Evaluation Covering FY 2022

- (1) Policies for initiatives of the Board of Directors
- To realize the NGK Group Vision, the following items shall be regularly reported to and monitored by the Board of Directors.
    - ✓ Status of business portfolio revision
    - ✓ Progress on the New Value 1000 (aiming for sales of 100 billion yen from new commercialized products by 2030)
    - ✓ Progress on various committee activities and company-wide projects - Progress on human resources strategy
    - ✓ Status of company-wide risk management

[Main initiatives]  
Multiple reporting dates were specified for each of the items listed above as year-long issues. For company-wide risk

management in particular, the Risk Management Committee was established as a management committee that has reported directly to the president from FY 2023. The committee deliberated on formulation of policies, building the structure, and monitoring execution of risk management, among other topics, and reported these deliberations to the Board of Directors.

- More in-depth discussion on business strategy
- [Main initiatives]  
We continued the FY 2022 practice of holding expanded strategy meetings which outside officers also attend. Two such meetings were held and energy storage business strategy was prioritized for discussion.

- Enhancement of opportunities for dialog between senior management and outside officers
- [Main initiatives]  
Informal gatherings of senior management and outside officers were held once a month. Senior management also attended hearings convened by Audit & Supervisory Board members and outside directors, and provided an overview of the business and reported on other matters.

- Emphasis on dialog with shareholders and investors through IR activities
- [Main initiatives]  
The status of SR activities was reported regularly to the Board of Directors, in addition to the status of IR activities. Questions and answers from financial results announcements and presentations were also shared with Board of Directors meeting attendees.

● Methods of Effectiveness Evaluation for FY 2023

- (1) A survey comprising a total of 30 questions was conducted of all directors (9 members) and all Audit & Supervisory Board members (4 members) at the beginning of April 2024. The survey included six questions on policies for FY 2023 initiatives and two free-response questions. The analysis and evaluation of the responses were entrusted to an external organization. The survey questions are regularly revised in light

- (2) Policies for initiatives of the Nomination and Compensation Advisory Committee
- Further sharing of the status of discussions from the committee to the Board of Directors
- [Main initiatives]  
Committee meeting materials on the status of discussions, details of deliberations, etc. were conscientiously shared with the Board of Directors.

- Further enhancement of information provided to the committee on compensation and nomination
- [Main initiatives]  
Internal directors who were committee members and the committee secretariat provided more detailed data on the career history, skills, and roles expected of candidates for new director positions.

● Summary of Evaluation Results for FY 2023

- (1) A summary of the evaluation results was reported to the Board of Directors at its meeting on June 5, 2024.
- (2) Based on the results of the survey, the external evaluation of the effectiveness of the Board of Directors (including the Nomination and Compensation Advisory Committee) was high overall, and stated that the Board of Directors is operating appropriately.
- (3) Overall comments from the external organization are as follows:
- The NGK Board of Directors has properly maintained the elements that form the foundation necessary to support Board of Directors functions, including the commitment of each member and a healthy Board culture. Based on the results of effectiveness evaluations from the past several years, we can state that the Board of Directors continues to maintain this foundation as a strength.
  - The "Policies for initiatives of the Board of Directors for FY 2023" outlined based on the results of the effectiveness

- of recent changes in the environment.
- (2) As part of the effectiveness evaluation of the Board of Directors, the Nomination and Compensation Advisory Committee also conducted a survey of its members (chairperson, members, and observers), and entrusted the analysis and evaluation of the responses to an external organization.

- evaluation in the past fiscal year are appropriately reflected in the operation of the Board of Directors and the Nomination and Compensation Advisory Committee in the fiscal year under review. We observed that these policies are contributing to reinforcing effectiveness.
- On the other hand, we could see that Board is aware of issues related to discussion of long-term policies and strategies to optimize the business portfolio, monitoring human capital, intellectual capital, and other management resources, and ascertaining and discussing successor plans as well as development of senior management, performance, and other factors, to further improve effectiveness. In order to appropriately address these issues, we expect the Board to make continuous efforts to clearly identify and narrow down the agenda for sufficient discussion of important priorities, engage in more in-depth discussions, and find ways to improve reporting.

● Policies for Initiatives in FY2024 to Further Improve Effectiveness

- Based on the results of the evaluation in FY 2023 and discussion with the Board of Directors, we have formulated the following policies for initiatives for FY 2024. We will strive to reinforce the effectiveness of the Board of Directors and the Nomination and Compensation Advisory Committee through continuous efforts.
- (1) Policies for initiatives of the Board of Directors
- To realize the NGK Group Vision, the following items shall be regularly reported to and monitored by the Board of Directors:
    - ✓ Status of business portfolio revision - Progress on the New Value 1000 (aiming for sales of 100 billion yen from new commercialized products by 2030)
    - ✓ Progress on various committee activities and company-wide projects
    - ✓ Progress on human resources strategy
    - ✓ Status of company-wide risk management
    - ✓ IR and SR activities

- Clearly identify issues to prioritize for discussion and engage in more in-depth discussion of long-term management plans and business strategies (including Group companies).
  - Continue to enhance opportunities for dialog between senior management and outside officers while engaging in more in-depth discussion of successor plans and development of senior management.
  - Further enhance the provision of information to outside officers.
- (2) Policies for initiatives of the Nomination and Compensation Advisory Committee
- Continue to further share the status of discussions from the committee to the Board of Directors.
  - Continue to further enhance information provided to the committee on compensation and nomination.



➤ Status of activities by the Audit & Supervisory Board

The Audit & Supervisory Board is composed of four Audit & Supervisory Board members (all male). Audit & Supervisory Board members supervise directors' decision-making process and job performance, by attending meetings of the Board of Directors and other important meetings, receiving

reports from directors, employees, etc. and requesting explanations where necessary. In addition, they review the establishment and operation of so-called internal control systems, and confirm the appropriateness of accounting auditors' auditing methods and results.

Main Agenda Items and Reported Matters in FY2023

- Resolutions
- Audit & Supervisory Board members' audit policy and audit plan and audit reports of the Audit & Supervisory Board
  - Consent to the proposal for the appointment of Audit & Supervisory Board members
  - Consent to the compensation, etc. for the Accounting Auditor
  - Confirmation of proposals and documents to be submitted to the General Meeting of Shareholders
  - Consent to comprehensive advance agreement process for non-assured engagement provided by the auditing firm to which the accounting auditors belong and its network firm

- Reports
- Report on audit activities by full-time Audit & Supervisory Board members
  - Audit plan by the Accounting Auditor
  - Report on Financial Results by the Finance & Accounting Department
  - Financial audit report by the Accounting Auditor
  - Report on the results of internal audits by the Auditing Department
  - Confirmation of the Convocation notice of the annual shareholder's meeting

➤ Status of activities by the Nomination and Compensation Advisory Committee

The Nomination and Compensation Advisory Committee was established in order to ensure fairness and enhance transparency in officers' personnel matters, the determination of compensation, and other matters as an advisory body to the Board of Directors. The committee receives inquiries from the Board of Directors and then deliberates on personnel matters for directors and the Audit & Supervisory Board members, matters relating to compensation for directors and executive officers, upper limit on the total compensation amount for directors and Audit & Supervisory Board

members, and a succession plan for the Chief Executive Officer, etc. The committee reports its results to the Board of Directors. The committee consists of a majority of independent outside directors and a committee chair who is selected from among the independent outside directors. It is composed of four male members and two female members. One outside Audit & Supervisory Board member attends committee meetings as an observer to confirm the appropriateness of the deliberation process.

Main Agenda Items in FY2023

- Agenda items
- Appointment of directors, representative directors, and directors with specific titles
  - Compensation (cash and stock-related compensation) commensurate with the position of each individual director

- and executive officer
- Amount of performance-linked bonuses to be paid to each individual director in FY2023
- State of development of successors to the Chief Executive Officer

➤ Director and Audit & Supervisory Board member compensation

We established a compensation system for directors (excluding outside directors) and executive officers that contributes to the Group's sustainable growth and the enhancement of its medium-to-long-term enterprise value. This system is aligned with the NGK Group Philosophy and realizing the NGK Group Vision.

Compensation for directors (excluding outside directors) and executive officers consists of three components: basic compensation, a performance-linked bonus, and stock-based compensation. To prioritize their independence from management, Outside Directors and Audit & Supervisory Board members are paid only fixed annual compensation, and do not receive performance-linked bonuses or stock-based compensation in the form of restricted shares.

The relative ratios of variable compensation and fixed annual compensation are determined with a focus on stability and improving medium and long-term performance. Variable compensation, which is comprised of a performance-linked bonus and the cash conversion value of allocated restricted

shares, is set as an appropriate percentage of total compensation. The total amount of compensation, including basic compensation, is set according to the position and rank of each recipient. Compensation is set to an appropriate level relative to the size of our Company, which is determined based on data from reliable external organizations. At the request of the Board of Directors, the Nomination and Compensation Advisory Committee, which consists of a majority of Independent Outside Directors, deliberates on the policies and procedures related to determining compensation. These deliberations include the following:

- Total maximum compensation for all Directors and Audit & Supervisory Board members
- Basic compensation, the base amount for calculating performance-linked bonuses, and the number of restricted shares to be allocated (the level of monetary claims for payment issued as compensation for restricted shares granted) to each individual director and executive officer based on their respective position and rank

- The amount of the performance-linked bonus for each individual director

The Committee then submits a report on the results of its deliberations to the Board of Directors. The Board of

Directors determines the amounts of compensation for directors and executive officers after sufficient consideration of the recommendations received from the Nomination and Compensation Advisory Committee, as described above.

Composition of Compensation for Directors, Audit & Supervisory Board Members and Executive Officers

Basic compensation	+	Performance-linked bonus	+	Restricted shares
Fixed annual compensation corresponding to position		Bonus corresponding to annual business performance		Same benefits and risks as shareholders
Directors: 800 million yen or less in an annual amount (including an annual amount of 60 million yen or less as the compensation limit for outside directors)			Directors: Annual amount not exceeding 200 million yen	
Audit & Supervisory Board members: 150 million yen or less in annual amount				

Composition Ratio of Director Compensation for FY2023

Persons Eligible for Payment	Basic compensation	Performance-linked bonus	Stock-related compensation
Representative Director	55%	30%	15%
Directors (Excluding Outside Directors)	64%	22%	14%
Outside Directors	100%	—	—

● Items Related to Performance-linked Compensation, etc.

Details of Performance Indicators and Reasons for their Selection Based on Calculation of Performance-linked Compensation Amount

NGK pays its directors (excluding outside directors) and executive officers performance-linked bonuses as performance-linked compensation. These are calculated using the following indicators.

Short-term perspective	<ul style="list-style-type: none"><li>• Changes in net sales, operating income, or net income for the current fiscal year compared to the last</li><li>• Achievement rate for return on invested capital (ROIC)* against targets set at the beginning of (or during) the period</li></ul> <p>*Using NGK ROIC (calculated based on operating income, accounts receivable, inventories, and fixed assets)</p>
Medium- to long-term perspective	<ul style="list-style-type: none"><li>• Percent of Operating Income Attained for Medium- to long-term Performance Targets in the NGK Group Vision</li><li>• Rate of Achievement of Keep Up 30* for New Products / New Business Creation</li><li>• Rate of achievement of CO<sub>2</sub> emissions reduction targets in a single year</li></ul> <p>*A target of 30% or higher net sales from new products (as defined by NGK)</p>

Percent Allocated per Item for Performance-linked Bonuses and Performance Appraisal Indicators

Item	Percent Allocated	Evaluation Coefficient Variance Ratio	Performance Appraisal Indicators (Calculated in practice by replacing each indicator with the variance ratio and evaluating it.)
Short-term Indicators	40%	-100% to +100%	Net sales, operating income, and net income for current period · Initial target values and actual values for current period
		-100% to +100%	Return on invested capital (NGK ROIC) · Initial target values and actual values for current period
Medium- to long-term Indicators	60%	-100% to +100%	NGK Group Vision medium- to long-term performance targets (operating income) · FY2025 target values for each past year and actual values for current year
		-100% to +100%	Material Issue Achievement Rate (Keep Up 30* for New Products / New Business Creation, CO <sub>2</sub> emissions reduction targets in a single year, etc.)

Achievement Concerning Performance Indicators Used to Calculate Performance-Linked Compensation

The following results are based on the primary performance indicators used to calculate performance-linked bonuses for FY2023.

- Consolidated financial figures for preceding period (FY2022): Net sales of 559.2 billion yen, operating income of 66.7 billion yen, and net income of 55.0 billion yen
- Target values for beginning of term (FY2023): 9.3% return on invested capital
- Consolidated financial figures for current period (FY2023): Net sales of 578.9 billion yen, operating income of 66.3 billion yen, net income of 40.5 billion yen, and 9.8% return on invested capital
- Operating income for medium- to long-term performance targets in NGK Group Vision: 66.3 billion yen (actual)
- Keep Up 30\* for New Products / New Business Creation: Net sales ratio from new products (as defined by NGK) not attained
- Efforts to reduce CO<sub>2</sub> emissions: CO<sub>2</sub> emissions reduction effect: Achieved FY2023 CO<sub>2</sub> emissions (consolidated) target of 560,000 tons through efforts such as reducing CO<sub>2</sub> emissions intensity\* (through energy conservation)

\*CO<sub>2</sub> emissions unit: Volume of CO<sub>2</sub> emissions per unit produced

● Non-monetary Compensation, etc.

Details of non-monetary compensation

NGK grants restricted share compensation to directors (excluding outside directors) and executive officers (excluding executive officers who are overseas residents on a non-temporary basis) in order to increase their sensitivity to stock price, to further share with shareholders the benefits and risks associated with stock price fluctuations, and to motivate them

to improve enterprise value over the medium to long-term. Since stock price fluctuations are directly related to its value, the amount of restricted shares is not fixed, but the number of shares granted is fixed in accordance with the position. An overview of the restricted share compensation we granted in FY2024 is as below.

Overview of Restricted Share Compensation	
Class and number of shares to be issued	NGK common stock: 126,500 shares
Issue price	2,082 yen per share
Aggregate issue amount	263,373,000 yen
Persons eligible for the allotment of the shares and the number thereof, as well as the number of shares to be allotted	NGK directors (excluding outside directors): 6 people, 45,500 shares Executive officers who do not concurrently serve as NGK directors: 24 people, 81,000 shares (excluding executive officers who are overseas residents on a non-temporary basis)

\*Period of the transfer restriction stipulated in the restricted share allotment agreement (hereinafter the Allotment Agreement):  
The allottees must not transfer, establish as security interests or otherwise dispose of NGK's ordinary shares allotted to them according to the Allotment Agreement from the date on which they receive their allotment according to the Allotment Agreement to the point in time directly after retiring from the position determined in advance by NGK's Board of Directors from among the positions of NGK's officers and employees.

Clawback clause

NGK has a provision to acquire all of the accumulated allotted stocks without compensation in the event that the allottee of the restricted shares violates laws and regulations

during the period of the transfer restriction, or in the event that certain other conditions stipulated in the allotment agreement are met.

Stock holding guideline for Directors and Executive Officers

In order to foster a sense of shared value between directors and executive officers and shareholders, and to contribute to the sustainable growth of the NGK Group and the enhancement of its enterprise value over the medium to long-term, NGK has established guidelines for holding its own stock, etc.\*1 and in principle, within three years of assuming office, directors and executive officers shall endeavor to hold company stock, etc. equivalent to the following values.

\*1 Includes stock compensation-type stock options that have not yet reached the exercise commencement date.

Persons Eligible	
Directors (Chairman and President)	150% or more of basic compensation (annual amount)
Directors*2 and Executive Officers*3	100% or more of basic compensation (annual amount)

\*2 Excluding Chairman, President, and outside directors  
\*3 Excluding executive officers who are overseas residents on a non-temporary basis

➤ Amount of Compensation for Directors and Audit & Supervisory Board Members

Compensation for Directors and Auditor & Supervisory Board Members (FY2023)

Director category	Total compensation (million yen)	Total compensation by type (million yen)			Applicable officers (people)
		Fixed compensation	Performance-linked compensation	Restricted share compensation	
Directors (excluding Outside Directors)	526	301	150	74	6
Outside Directors	42	42	—	—	3
Audit & Supervisory Board Members (excluding Outside Audit & Supervisory Board Members)	71	71	—	—	3
Outside Audit & Supervisory Board Members	28	28	—	—	2

Notes: The total amount of compensation for Audit & Supervisory Board members (excluding outside Audit & Supervisory Board members), the total amount of compensation by type, and the number of applicable officers noted above include one Audit & Supervisory Board members who resigned from their position on June 26, 2023 and the amount of compensation they received.

Officers Receiving Total Compensation of ¥100 Million or More (FY2023)

Name	Officers category	Company category	Total compensation by type (million yen)			Total compensation (million yen)
			Fixed compensation	Performance-linked compensation	Restricted share compensation	
Taku Oshima	Director	Submitting company	67	37	17	122
Shigeru Kobayashi	Director	Submitting company	67	37	17	122

➤ Management Succession Planning

The revised NGK Group Chief Executive Officer Succession Plan was approved by resolution of the Board of Directors in April 2023. This succession plan establishes the required qualities, development policies, selection procedures, and other actions for developing chief executive officer

successors. Based on this, the president provides the Nomination and Compensation Advisory Committee with a progress report on the plan each year, and the committee reviews the appropriateness of the plan.

➤ Training Policies for Officers

Directors and Audit & Supervisory Board members have been tasked with the responsibility of exercising the due care of a good manager. NGK therefore has established a training policy of providing the following types of opportunities to sharpen skills and knowledge so that they can fully execute their duties as experts in various kinds of management or as supervisors of business execution.

1. For internal officers: Training on the Companies Act, the Financial Instruments and Exchange Act, competition laws, and other aspects of corporate governance and compliance
2. For outside officers: Mainly providing separate explanations from the department in charge concerning items on the agenda of the Board of Directors and regularly providing information on the business environment and issues as well as opportunities for exchanging opinions

➤ Policy on Cross-Shareholdings

NGK maintains cross-shareholding of listed stock that contribute to the long-term business development of our group for the primary purpose of maintaining and strengthening business relationships. Moreover, we maintain strategic cross-shareholding with each company in the Morimura Group, with which we share a founder. Since the Group brand forms a part of our enterprise value through its history and philosophy, this arrangement aims to enhance the quality of management for both sides.

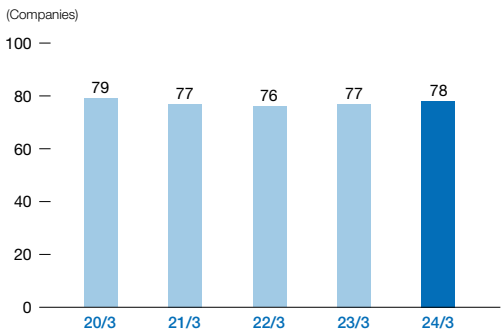
As part of our portfolio of assets, these all provide the supplemental liquidity deemed necessary by our business plan. While we are always looking to reduce the scope of our cross-shareholding in the interest of asset efficiency, it may fluctuate due to factors including overall business trends, changes in risks, financial conditions, and business relationships with individual parties. Moreover, for stocks, the Board of Directors not only considers the significance of

holdings from the perspective of business relationships, but periodically confirms the appropriateness of continued holdings, the safety of ratings, and the efficiency of dividend yields, together with capital policy. Meanwhile, when comparing our capital costs, we do not evaluate stocks alone, but manage return on invested capital (NGK ROIC) for each business with differing risks and expected returns. And we include our cross-shareholding valuations in the balance sheet of each business. We exercise voting rights accompanying cross-shareholdings from the perspective of whether the content of a proposal would be detrimental to shareholder interests. We also pay attention to whether the company whose shares we hold is managed with an emphasis on increase enterprise value and shareholder profits.

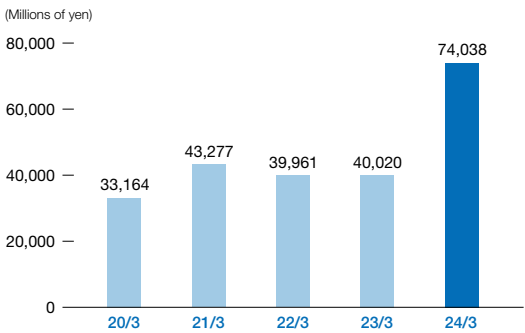
We sold 1,109 million yen in two specified investment stocks in FY2023 as a result of this verification.

Status of Cross-Shareholding

Number of Cross-Shareholding Companies



Reported Cross-Shareholdings Balance





Compliance

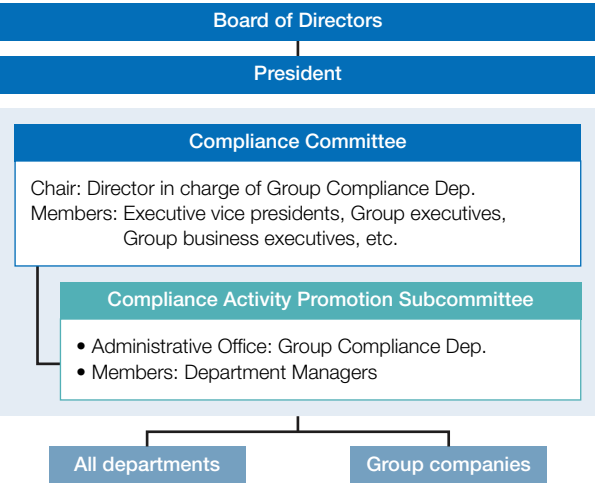
Compliance Promotion Structure

The NGK Group has established a Compliance Committee, which reports directly to the president. A Compliance Activity Promotion Subcommittee was established as part of the Compliance Committee to ensure proper execution of the Committee's work. The Compliance Committee regularly reports the matters it handles to the Board of Directors, and the Board of Directors supervises the activities of the Compliance Committee.

Since FY2021, we have asked Group companies to select compliance administrators and compliance officers and have begun discussions with them to establish the foundations of an effective and efficient compliance structure for the entire NGK Group. The Group Compliance Department is also leading the introduction of innovative training formats in each company using hybrid communication that includes group discussions as well as online and in-person meetings in an effort to enhance learning through interactive education. We have participants fill out questionnaires after they complete the training to gauge their level of understanding and consider improvements for the next round of training. The goal of pursuing these efforts is to make sure that each NGK Group

company will be able to independently formulate, implement, confirm effectiveness, and improve compliance measures in the future.

Compliance Promotion Structure Chart

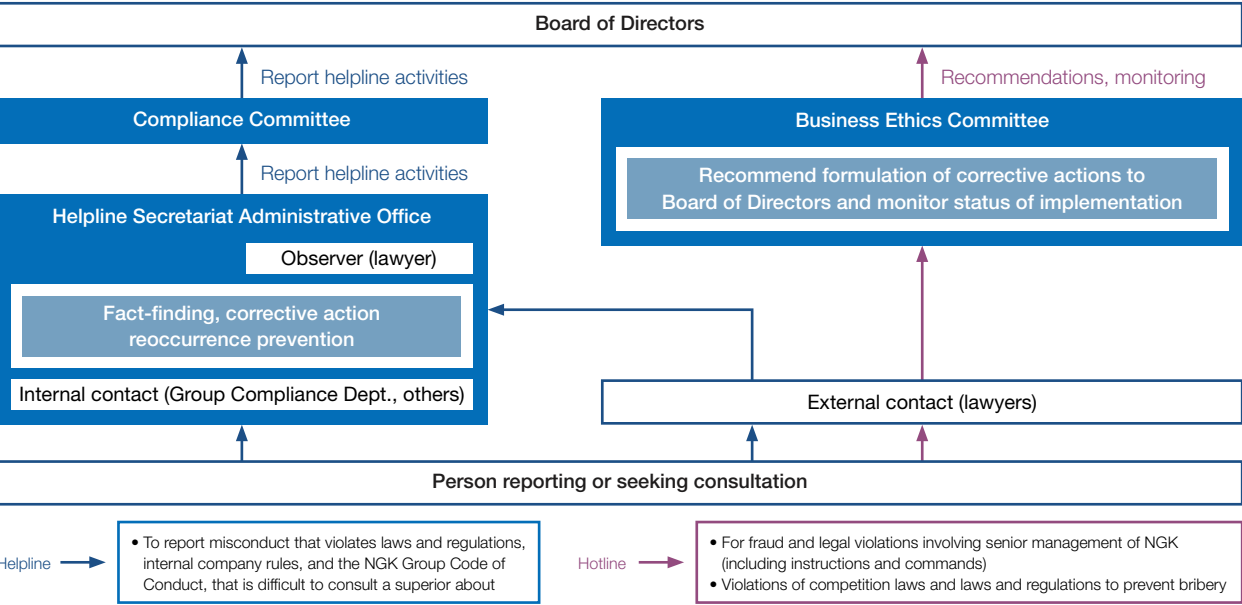


Whistleblowing System

Our whistleblowing system (helplines and hotlines) can be used by everyone who works at NGK and every Group company location. This includes officers, employees, employees dispatched on external assignments, advisors, contract employees, temporary employees based on a temporary employment agreement, and resident employees accompanying a service contract. We can handle consultations and reports via telephone or email in either Japanese or English. In principle, it is recommended to consult and report with his or her identity, but it is also possible to seek consultation anonymously through an

external contact. Our company rules guarantee protection of those seeking advice or reporting issues, and the NGK Group Code of Conduct prohibits retaliation against those who make reports. Upon receiving a report or consultation, we will consider whether it merits an investigation in a fair, impartial, and sincere manner, and promptly notify the person who sought advice or reported the issue of how it will be handled from here out. If the investigation reveals misconduct or a violation of the law, NGK will impose penalties on those involved in accordance with our employment regulations.

Organization of Whistleblowing System



Helpline

We have established a helpline to receive inquiries and reports from employees aimed at curtailing and preventing activities contrary to the spirit of the NGK Group Corporate Business Principles and to facilitate quick resolution when issues occur. Each Group company outside Japan has its own helpline.

Managers in-charge of internal whistleblowing system hotline and consultation work undergo annual training conducted by external lawyers. In FY2023, this training

included examples of fraudulent conduct, in addition to power harassment.

Number of Helpline Consultation Cases (NGK)

FY2021	FY2022	FY2023
43	38	35

Hotline

We have established a hotline as a whistleblowing system for responding to fraud and legal infractions committed by senior management of NGK, and all violations related to competition laws and anti-corruption laws. Outside lawyers manage the hotline and the Business Ethics Committee, which consists mainly of outside directors, handles issues. The Committee

reports these issues to the Board of Directors and takes corrective steps. We establish hotlines for reporting fraud or illegal activities involving overseas Group company executives based on local conditions. We have established hotlines for responding to violations of competition law and anti-corruption law in all overseas Group companies.

Observing Competition Laws on an International Level

In addition to stipulating compliance with competition laws in the NGK Group Corporate Business Principles, we also established Competition Laws Compliance Rules that are aligned with compliance with international standards. These standards are strictly enforced by the NGK Group in Japan and overseas to eradicate unfair business practices and to build and maintain fair and equitable business relationships with our business partners.

We also provide education and training aimed at ensuring widespread awareness and thorough compliance with rules. We established a Competition Laws Compliance Activity website and publish a practical manual to promote compliance. We revised the Competition Laws Compliance Handbook in FY2023 to accommodate changes in social conditions.

Third-party Review of Competition Law Compliance Program

Since FY2015, NGK has contracted PwC Advisory LLC (PwC) as a compliance specialist to review the operation of our competition law compliance program based on the Competition Law Compliance Rules, as well as NGK Group's unified supervision and reporting system for domestic and international group companies, from an objective point of

view. Since FY2017, PwC has been conducting interviews with executives of our business groups in order to assess their attitude toward compliance with competition laws, and to further raise their awareness of such compliance efforts. The results of these reviews are used to operate and improve our competition law compliance program.

Prevention of Corruption

As laid out in the NGK Group Corporate Business Principles, the NGK Group has declared our commitment to working to bring about a sustainable society, respect human rights, conduct business activities that are fair, transparent, and sound, and strive to comprehensively prevent corruption as called for in the NGK Group Code of Conduct. Corruption is contrary to the NGK Group Corporate Business Principles and

Code of Conduct, and cannot be tolerated. It not only impedes the realization of a sustainable society, but leads to human rights violations. We comply with applicable laws and regulations, prohibit direct or indirect involvement in corruption, and strive to prevent corruption in all of our business activities. We established the NGK Group Anti-Corruption Policy to earn the trust of stakeholders and bring about a sustainable society.

Conducting Anti-Bribery Training

NGK conducts position-specific training during which internal instructors provide detailed explanations on actions that constitute corruption. Additionally, we conduct every two

years compliance awareness surveys of all domestic Group employees to check instances of violations and signs of potential infractions in the workplace.

Risk Management

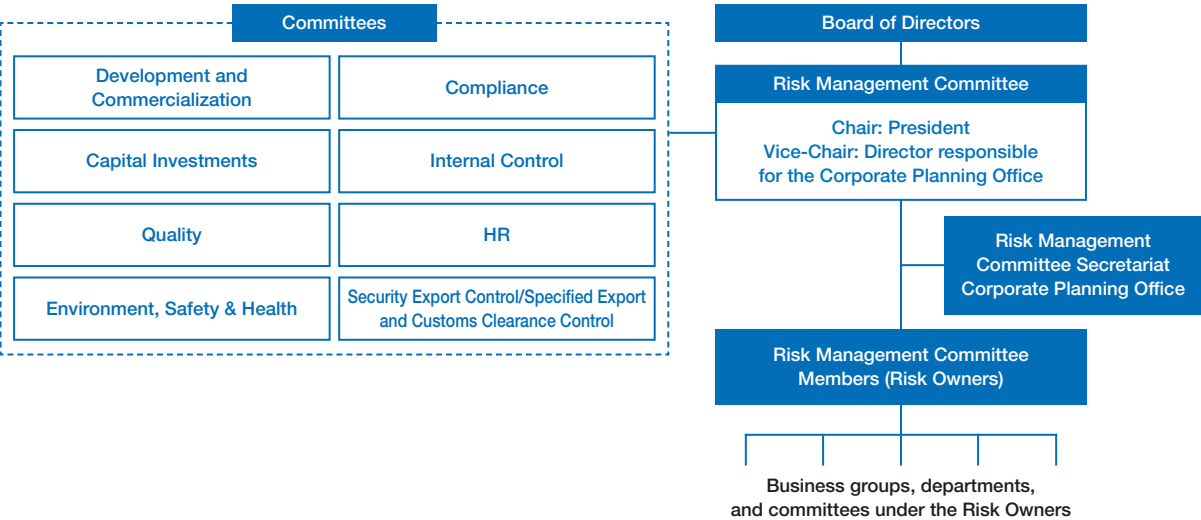
Basic Approach

The NGK Group considers uncertainties which may affect realization of the Group Vision to be risks. We have established an approach of handling risks according to their type, which enables us to control these risks by appropriately recognizing and preventing them, and to minimize losses caused by risks that do materialize.

Moreover, when risks that have a big impact on management occur, the committee tasked with handling the

risk according to the Basic Rules of Crisis Management, will lead the way in collecting information and ascertaining the situation. The NGK Group will then work to minimize the negative impacts, analyze the causes, and prevent recurrence. For extremely serious risks, the vice president in charge of the Corporate Planning Office will convene a response meeting attended by the President to respond to the risk.

Risk Management Structure



Risk Management Structure

In FY2023, the NGK Group established a new Risk Management Committee chaired by the President for comprehensively handling the Group's significant risk issues in accordance with the risk management process described below. At least once a year, the Risk Management Committee reports to the Board of Directors about risk management

activities. Through this, the Board of Directors is able to supervise these efforts and verify the effectiveness of the risk management structure. The risk management structure in question, is managed independently of the Audit & Supervisory Board.

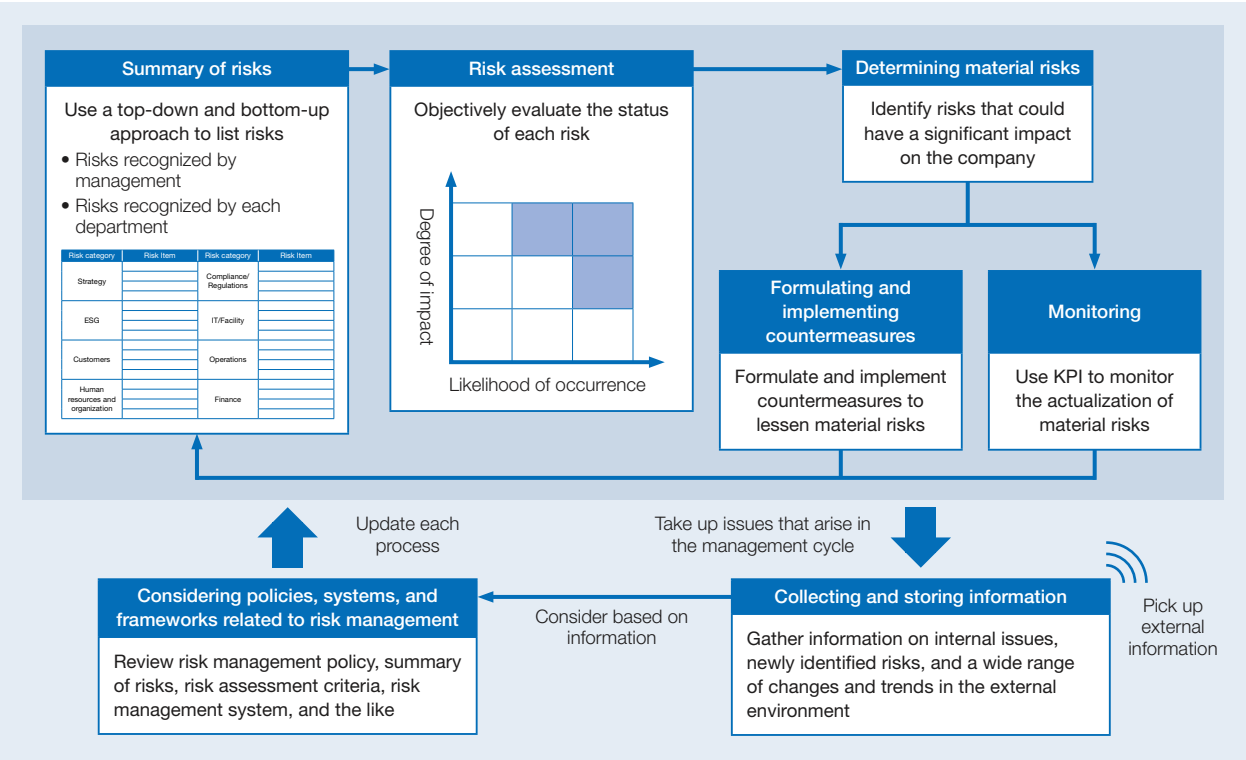
Risk Management Process

The Risk Management Committee periodically analyzes and evaluates risks then identifies and reviews the material risks that should be managed based on changes in the internal and external environment, with reference to the concepts in the COSO-ERM Framework. It has also established a risk management structure and method for formulating and implementing countermeasures against risk and monitoring the manifestation of risks via the committees and departments in charge of managing risks. The Risk Management Committee manages the risks facing the NGK Group in an interdisciplinary manner based on the concept of risk management determined by the Board of Directors, and

reports its activities to the Board of Directors.

In order to address risks that have suddenly increased in importance due to abrupt changes in the internal and external environment, we make sure we are able to respond by adding them in a timely manner to the list of targets to be handled by the Risk Management Committee. After the Noto Peninsula Earthquake in FY2023, we determined that the importance of natural disaster risk had increased and added it for review by the Risk Management Committee in addition to the material risks that had already been determined through committee deliberation and approval by the Board of Directors.

Material Risk Management Cycle

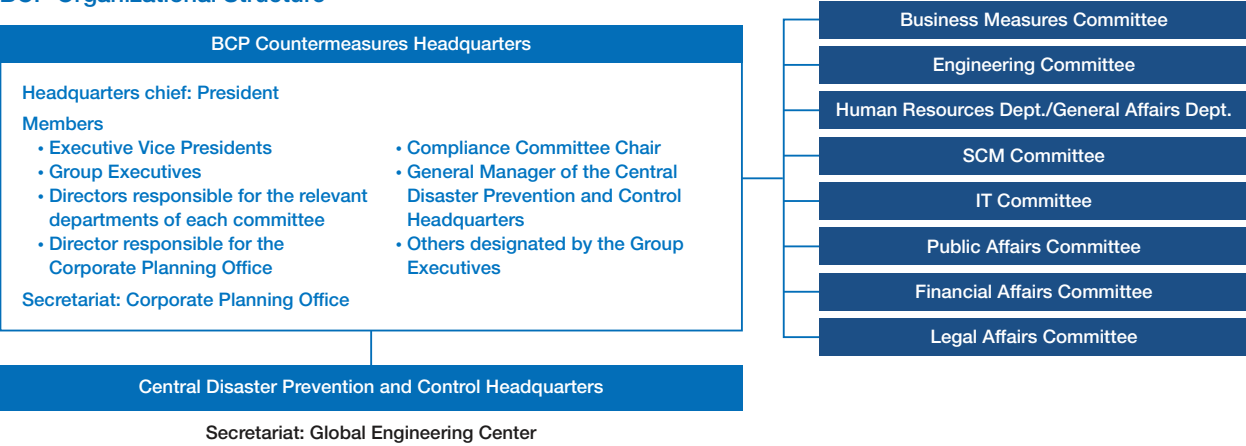


Business Continuity Plan (BCP) Initiatives

At NGK, we have established the BCP Countermeasures Headquarters under the direction of the President as an organization to carry out operation and maintenance of our business continuity plan, with the aim of respecting human life and cooperating with the local community. It promotes our business continuity plan (BCP) throughout the entire NGK Group. Measures taken in preparation for putting our BCP into operation include the establishment of multiple manufacturing bases and procurement sources, damage mitigation measures related to buildings and equipment, and employee safety assurance. We also conduct emergency drills based on scenario plans presuming a major disaster

such as a large earthquake in the Nankai Trough with the aim of enhancing our ability to cope with a crisis in the event a disaster occurs. During these drills, participants are instructed to take real action according to the plan. This helps us to identify even small issues with each process and procedure and use our findings to improve the BCP. In addition, the BCP Secretariat leads the way in working to ensure business continuity by collecting information early on and implementing countermeasures in response to procurement difficulties stemming from the spread of infectious disease or changes in the global situation.

BCP Organizational Structure



\*In the event of an emergency or disaster, the Central Disaster Prevention and Control Headquarters will switch over to the Central Disaster Control Headquarters to respond to the disaster.



Information Security Measures

Within the NGK Group, proper management and operation of information assets is a collaborative effort carried out by the General Affairs Department and ICT Department, in conjunction with other relevant administrative departments and in line with the Basic NGK Group Information Security Policy.

Every employee who uses a computer or other information-processing devices as part of their job is provided with our Electronic Information Security Handbook and is trained in the proper use of their devices, as well as made aware of the need to contact the General Affairs Department and ICT Department if the devices are lost, infected with a computer virus, or otherwise compromised. Also, under the rules of employment, employees are subject to disciplinary

action if their improper use of information devices results in the leaking of confidential information or some other result that significantly impacts the company.

Meanwhile, personnel from NGK's ICT Department visit several Group companies each year to conduct on-site checks into the status of IT security measures and to provide guidance on their implementation. In FY2023, we conducted visits to overseas Group companies in Europe, the USA, and Asia. We also held online IT Global Meetings several times for all overseas Group companies in the regions of North and Central America, Europe and Africa, China, and Asia Pacific. Group companies in each region discussed IT security operations and conducted training on how to handle security incidents.

Formulation of the Basic NGK Group IT Security Standards

The rapid advance in information communication technologies and devices has made the quest for consistent IT security on a Group-wide level an urgent concern. Therefore, in FY2010, we formulated the NGK Group IT Security Standards with the goal of developing an IT security structure based on commonly shared Group standards and raising the bar when it comes to IT security. We update these standards every year in response to societal changes and trends, and work to standardize the level of IT security in our

Group by sharing them with each group company. In FY2023 we reviewed the sections pertaining to the handling of data when using cloud services.

Every year, each Group company drafts action plans for the enactment of countermeasures in an attempt to systematically strengthen security. Via these action plans, NGK confirms initiatives at each Group company and provides guidance as necessary.

Information Security Training

We conduct training sessions throughout the year to ensure strict adherence to information security among all employees.

We offer training for newly hired employees and newly promoted supervisors and managers to NGK employees while e-learning is offered to NGK employees and employees of some Group companies in Japan.

Item	Participants	Participation rate
Training for newly hired employees	168	100%
Training for newly promoted supervisors	130	100%
Training for newly promoted managers	94	100%
E-learning	7,006	85.8%

Note: Excluding employees who were away on maternity leave, childcare leave, long-term business trips, etc.

Ensure IT Security Against Cyberattacks

As a countermeasure against cyberattacks, NGK is strengthening each category of protection, detection, response, and recovery from cyberattacks following the cybersecurity framework announced by the National Institute of Standards and Technology (NIST) of the U.S.

In FY2023, we introduced an SOC (Security Operation

Center) at all Group companies which primarily enhances detection and response. Meanwhile, we carried out training for all members of our headquarters and domestic Group companies concerning email spoofing. By getting them to recognize the threats close at hand, we hope to improve their awareness of security.

Personal Information Management

The NGK Group has established Personal Information Management Regulations, in addition to maintaining privacy policies and regulations in accordance with the laws and regulations of each country regarding personal information.

We have outlined policies and rules that conform to the Act on the Use of Numbers to Identify a Specific Individual in Administrative Procedures and reinforce the appropriate management and handling of Individual Numbers.

Privacy Policy  
<https://www.ngk-global.com/privacypolicy/>  
LINK



Message from our Outside Directors



Applying various stakeholder perspectives to contribute to a governance structure for improving enterprise value.

Outside Director  
Emiko Hamada

FY2023 saw the normalization of economic activities as COVID-19 subsided. However, issues such as the tense situation happening in Ukraine and growing tensions in the Middle East have driven unanticipated changes in the economic environment. Overall, it was a year that required flexibility in management decisions. Amid such an environment, the NGK Group enacted policies to promote a business structure shift in accordance with the NGK Group Vision. In particular, the Group outlined numerous promising themes related to New Value 1000, the goal of aiming for over 100 billion yen in net sales from new business by 2030, and the status of progress for each of these themes is becoming clearer. The Group is also increasingly expanding its collaborations with external partners, and I feel the seeds of a wide variety of prospective businesses are beginning to take root. Launching a new business requires a great deal of energy and those efforts seldomly produce immediate results. However, even the projects that do not go as planned will undoubtedly serve as fuel for the NGK Group's next stage of growth. I feel the company's commitment to pursuing major goals. I also have strong expectations that this spirit will help cultivate the next generation of leaders for the company. The NGK Group market evaluation was a PBR of less than 1.0 as of March 31, 2024. I view this structural shift and the NGK Group growing expectations towards new business creation as a positive process towards increasing enterprise value.

I feel the NGK Group's Board of Directors is able to have a wide range of meaningful discussions in collaboration with the Executive Committee. Over the past year, human capital strategy has been a point of discussion, especially at meetings such as the Conference of Outside Directors and Outside Audit & Supervisory Board Members. At these meetings, various opinions were exchanged on the issue of securing and developing human capital and how to utilize human capital. Human capital is the source of a company's future growth, making this one of the most important issues towards improving enterprise value over the medium- to long-term. I also offered various

opinions regarding how the NGK Group can better promote itself in response to the issue of new graduate recruitment the company has faced in recent years. My overall impression is that we were able to have stimulated deliberations on these matters.

The NGK Group also advanced discussions concerning Group sustainability. Another development I consider a major achievement is that the NGK Group has established a structure for achieving sustainability. This includes presenting a concrete approach to materiality. The common theme of sustainability is something that impacts all aspect of business, and I feel that this is leading to an increased sense of unity within the Group.

Outside Directors are expected to provide advice and supervise management from an objective perspective, without being influenced by internal opinions or information from the company. I maintain a neutral perspective on issues that may be commonplace for people within the company and methods that have been used for many years. I will search for hidden issues or things that need to be updated to better reflect the times. Resolving small issues can lead to the discovery of common issues, which can help increase vitality as a whole. As such, I will be diligent to ensure I do not overlook even small discoveries. It is also important that the NGK Group demonstrate to stakeholders how current reforms are working to change the company. I hope to play a role in encouraging stronger information dissemination.

This fiscal year, three new Outside Directors were appointed. With the addition of people from different backgrounds, expectations are high that these new members will stimulate new and fresh discussions and ideas. Additionally, I have been appointed to chair the Nomination and Compensation Advisory Committee. As someone outside the company, I am aware that I am expected to offer a stakeholder's perspective, and I will work hard to ensure objectivity and transparency when determining remuneration. I will also promote committee management that takes an open and transparent approach to discussions about succession plans, a critical agenda item for the committee.



**Proactively offer feedback backed by global management experience to support speedy business management.**

Outside Director  
**Hiroshi Sakuma**

I spent numerous years at Mitsubishi Corporation involved in operations related to infrastructure, power, environment, and renewable energy, and was deeply involved in the business management of Japanese and overseas subsidiaries and operating companies. I will leverage the experience and knowledge I have accumulated through my career to fulfill an independent and objective role monitoring business management and providing advice for the NGK Group.

As an Outside Director, the most important factor in monitoring business management is communication. Ideally, those responsible for business execution and those in a supervisory role must build relationships that enable frank discussion with the Board members acting as one team. With this in mind, I will work to understand the corporate culture that the NGK Group has inherited throughout the years and the employees who support company business. Based on that understanding, I will proactively offer feedback and support dynamic business execution by Group management.

I have had interactions with the NGK Group since back when I began my first job. I have always had the

impression that NGK is a traditional company engaged in very serious business grounded in their unparalleled ceramic technologies. NGK's greatest strength is its technological foundation, and the Group's greatest challenge moving forward will be how it leverages that technology to create new value. A market oriented perspective is essential to business moving forward. That is why I believe New Value 1000, the Group's strategy to combine technology and sales to focus on market and client needs towards generating 100 billion yen from new business, is very much on point. Creating new business is not easy and will likely take time. However, my hope is that all members of the NGK Group will embrace the spirit of challenge and unite to rapidly achieve even small successes as I strongly believe this will enable the Group to take dramatic leaps forward.

The NGK Group is heavily involved in environment and infrastructure, and has a critical role in helping create a bright, prosperous future. I find it motivating to be able to work with such a company and I will work tirelessly towards helping the NGK Group achieve sustainable increases in enterprise value.



**Apply experience and perspective as a product development engineer to advise and support the realization of the NGK Group Vision.**

Outside Director  
**Noriko Kawakami**

I built my career in the energy and digital fields, having spent many years involved in the development of power electronics products at Toshiba Corporation and Toshiba Mitsubishi-Electric Industrial Systems Corporation (TMEIC). During that time, I led projects related to high-capacity power converters used in infrastructure facilities such as power grids and

renewable energy systems. Recognized for my contributions to the development and commercialization of such systems, I was named a Fellow by the US Institute of Electrical and Electronics Engineering, Inc. (IEEE)\*.

Most recently, I accepted the role of Outside Director. I felt this would be an incredibly fulfilling task

through which I could apply the knowledge and expertise cultivated through my more than 40 years of experience working on the front lines of manufacturing. As an Outside Director, I hope to provide practical, experience-driven recommendations concerning the NGK Group's energy and infrastructure businesses. And, as a female engineer, it would be a privilege to engage in activities that help encourage the next generation of female engineers.

It is my understanding that the NGK Group's core competence lies in ceramic technologies. My impression of the Group is that, while it has a stringent corporate culture, it also maintains the flexibility to adapt to change. The Group is also engaged in efforts related to globalization. Most impressive is the Group's history, which spans over 100 years. This is evidence that, no matter the generation, the NGK Group has continuously challenged itself to achieve unprecedented value

creation. I believe the source of the Group's competitiveness can be found in its technology, which boasts high added value that cannot be mimicked by competitors.

Currently, the NGK Group is engaged in corporate structural reforms to position carbon neutrality and digital society at their core of their business. I believe the key to this transformation will be not only technological challenges but also commercialization. Whether it be advice on how to improve proposals and management towards supporting the shift from selling products to selling services, or advice on adapting to operating environment changes and course corrections, I will use my perspective as an engineer with real-world experience to provide powerful support towards realizing the NGK Group Vision.

\*The Institute of Electrical and Electronics Engineering. A global institute related to electrical engineering and electronic engineering. Based in the USA, the IEEE has over 400,000 members in 190 countries worldwide.



**Serve as a monitoring function for management to support sustainable growth for the NGK Group.**

Outside Director  
**Kengo Miyamoto**

As an attorney, I have spent many years involved in law, both in Japan and overseas. In that time, I have overseen cases for numerous companies across various industries, including manufacturing, services, logistics, and IT. I hope to contribute to the NGK Group's sustainable growth and medium- to long-term improvements in enterprise value by applying the knowledge and experience I have cultivated throughout my career. In my role as Outside Director, I will strive to confirm management strategy, monitor business execution, and provide effective recommendations concerning legal risks and preventing trouble associated with business operations.

As someone who has seen a great many companies, I have learned that companies with an active and energetic board of directors have a positive, motivated, and transparent culture. This, in turn, leads to diligent compliance and risk management. I have been told that the NGK Board of Directors is that they have cultivated an atmosphere that encourages everyone to express their opinions freely. I plan to embrace that atmosphere and use my external perspective to provide frank opinions on matters that can be difficult to see clearly from the inside.

In this world of remarkable changes in market environments, another extremely important element in business management today is decision-making speed. I feel that many Japanese companies tend to lack this sense of speed when compared to overseas businesses. It is not uncommon for that lack of speed to result in the loss of opportunity. The NGK Group is currently in the process of advancing corporate reforms, and I imagine the company will face numerous issues that require rapid decision-making. I intend to approach monitoring from this perspective as well.

Recent years have seen a growing importance on evaluating a company's enterprise value based on its unseen non-financial capital. A company must give due consideration to all its stakeholders, beginning with its shareholders and investors, while engaging in management that balances the creation of both economic value and social value. As an Outside Director, I will support the implementation of business management that is aligned with modern times. The NGK Group is challenging itself to make dynamic reforms, and it is my hope that stakeholders will take a medium- to long-term perspective towards evaluating the company's progress.



Directors, Audit & Supervisory Board Members, and Executive Officers (As of June 26, 2024)

Directors



Taku Oshima  
Chairman



Shigeru Kobayashi  
President  
Overall Corporate Management, Executive Committee Chair, Strategy Committee Chair, ESG Management Committee Chair, Risk Management Committee Chair



Chiaki Niwa  
Executive Vice President  
Top Executive R&D, Responsible for Corporate R&D, Manufacturing Engineering, Corporate Safety, Quality & Environment Dept., IP Strategy Dept., Digital Transformation & Innovation Dept., and ICT Dept., Development and Commercialization Committee Chair, Quality Committee Chair, Environment, Industrial Safety & Health Committee Chair



Ryohei Iwasaki  
Executive Vice President  
Responsible for Business Groups, Group Executive, Corporate NV Creation, Development and Commercialization Vice Committee Chair



Emiko Hamada  
Outside Director



Hiroshi Sakuma  
Outside Director



Noriko Kawakami  
Outside Director



Kengo Miyamoto  
Outside Director



Hideaki Shindo  
Director and Senior Vice President  
Responsible for ESG Management Dept., Corporate Planning Office, Secretarial Office, Finance & Accounting Dept., and Purchasing Dept., Senior Officer in charge of Group Companies, ESG Management Vice Committee Chair, Risk Management Vice Committee Chair



Mayumi Inagaki  
Director and Senior Vice President  
Responsible for Auditing Dept., Human Resources Dept., Group Compliance Dept., Legal Dept., and General Affairs Dept., Chief Compliance Officer, Compliance Committee Chair, Internal Controls Committee Chair, HR Committee Chair



Nobumitsu Saji  
Audit & Supervisory Board Member



Naoya Yagi  
Audit & Supervisory Board Member



Masayoshi Sakaguchi  
Audit & Supervisory Board Member, Outside




Takashi Kimura  
Audit & Supervisory Board Member, Outside

Audit & Supervisory Board Members


Skill Matrix of Directors and Audit & Supervisory Board Members

Name	Attributes			Stocks held etc.		Meeting attendance record					Field of experience							Specialized knowledge		
	Years in Office	Gender	Independent Officer	Number of shares of the Company held	Number of stock acquisition rights owned (Equivalent number of shares)	Board of Directors	Audit & Supervisory Board meeting	Nomination and Compensation Advisory Committee	Business Ethics Committee		Business Management	Sustainability	Overseas business International experience	Marketing	Manufacturing technology R&D	Carbon Neutrality	Digital	Finance	Legal Compliance	HR/ Labor
Taku Oshima	10	Male		30,000	66,000	◎100% (15/15)		100% (4/4)			●	●	●		●	●				●
Shigeru Kobayashi	4	Male		30,126	21,000	100% (15/15)		100% (4/4)			●	●	●	●		●				
Chiaki Niwa	9	Male		24,000	27,000	100% (15/15)					●	●		●	●	●		●		
Ryohei Iwasaki	15	Male		24,000	36,000	100% (15/15)					●	●	●	●		●	●			●
Hideaki Shindo	3	Male		13,000	10,000	100% (15/15)						●	●	●			●			
Mayumi Inagaki	—	Female		8,741	5,000	—						●						●		
Emiko Hamada	7	Female	●	5,000	—	100% (15/15)		◎100% (4/4)	◎100% (5/5)		●	●	●	●	●	●	●			
Hiroshi Sakuma	—	Male	●	—	—	—			—		●	●	●	●	●	●				●
Noriko Kawakami	—	Female	●	3,000	—	—			—			●	●	●	●	●				
Kengo Miyamoto	—	Male	●	—	—	—			—			●	●					●		●
Nobumitsu Saji	3	Male		5,000	7,000	100% (15/15)	◎100% (14/14)					●	●	●			●	●		●
Naoya Yagi	1	Male		4,243	—	100% (11/11)*	100% (10/10)*					●	●	●			●	●		
Masayoshi Sakaguchi	5	Male	●	—	—	100% (15/15)	100% (14/14)	◇100% (4/4)	100% (5/5)		●	●						●		●
Takashi Kimura	2	Male	●	—	—	100% (15/15)	100% (14/14)		100% (5/5)		●	●				●	●	●		●

Notes:  
1. ◎ indicates the Chair.  
2. ◇ indicates attendance as an observer.  
3. Meeting attendance shown is for FY2023.  
\*This applies to the Board of Directors and Audit & Supervisory Board held after the appointment on June 26, 2023.



Reasons for selection as field of experience/  
specialized knowledge  
[https://www.ngk-insulators.com/en/  
sustainability/governance-board.html](https://www.ngk-insulators.com/en/sustainability/governance-board.html)



11-Year Key Financial and Non-Financial Data

Financial Indicators

(Millions of yen)

	2014/3	2015/3	2016/3	2017/3		2018/3	2019/3	2020/3	2021/3	2022/3	2023/03	2024/03
Net sales	308,671	378,665	435,797	401,266		451,125	463,504	441,956	452,043	510,439	559,240	578,913
Cost of sales	208,052	254,386	289,266	272,434		312,107	323,224	313,458	329,061	347,748	405,463	423,059
Selling, general, and administrative expenses	56,366	62,700	65,633	65,619		68,991	75,574	73,496	72,158	79,163	87,015	89,456
Operating income	44,252	61,577	80,898	63,212		70,026	64,705	55,000	50,823	83,527	66,761	66,397
Net income attributable to owners of the parent	27,045	41,504	53,316	36,379		45,814	35,506	27,135	38,496	70,851	55,048	40,562
Capital expenditures	28,434	30,366	45,437	60,101		71,713	105,336	93,997	50,831	38,130	43,694	47,296
Research and development expenses	12,060	13,942	17,410	18,653		21,100	23,271	22,928	22,448	23,551	26,157	31,605
Net cash provided by operating activities	32,647	73,002	59,445	80,172		50,554	61,224	53,200	85,641	94,831	97,949	99,159
Net cash used in investing activities	(21,185)	(39,495)	(47,772)	(56,452)		(49,413)	(109,743)	(60,830)	(51,724)	(46,291)	(52,006)	(68,593)
Net cash provided by financing activities	2,026	(26,000)	(373)	(13,013)		22,546	3,564	(18,796)	12,250	(45,263)	(34,568)	(36,123)
Total assets	614,219	702,234	711,897	759,434		826,243	863,636	833,085	908,967	982,833	1,029,168	1,127,576
Interest-bearing debt	167,295	156,203	163,973	174,150		211,573	229,423	234,400	264,244	252,350	253,356	259,325
Net assets	344,453	404,001	417,972	427,593		472,863	489,245	469,118	517,892	589,594	642,446	703,225
Profit per share (yen)	82.82	127.11	163.28	112.71		142.42	110.35	84.73	121.61	226.56	177.47	133.65
Cash dividends per share (yen)	22	28	38	40		44	50	50	30	63	66	50
Ratio dividends to net worth (%)	26.6	22.0	23.3	35.5		30.9	45.3	59.0	24.7	27.8	37.2	37.4
Return on equity (ROE) (%)	8.6	11.4	13.3	8.8		10.4	7.6	5.8	7.9	12.9	9.0	6.1
Equity ratio (%)	54.3	55.8	57.1	54.9		55.8	55.3	55.0	56.3	59.3	61.7	61.7
Price-earnings ratio (PER)	26.0	20.2	12.7	22.4		12.9	14.6	16.7	16.6	7.7	9.9	15.3
Price-book value ratio (PBR)	2.1	2.1	1.7	1.9		1.3	1.1	1.0	1.3	0.9	0.8	0.9
Closing stock (yen)	2,150	2,565	2,079	2,520		1,834	1,608	1,417	2,024	1,753	1,752	2,040
Number of employees, end of year (persons)	13,210	16,217	16,657	17,517		18,783	20,115	20,000	19,695	20,099	20,077	19,540

Non-Financial Indicators

	2014/3	2015/3	2016/3	2017/3		2018/3	2019/3	2020/3	2021/3	2022/3	2023/3	2024/3
GHG emissions (Scope 1: Energy-origin CO <sub>2</sub> ) (10,000 metric tons, NGK Group)	30.2	29.0	31.1	31.7		32.0	32.3	30.9	26.4	29.0* <sup>1</sup>	25.2* <sup>1</sup>	23.8* <sup>1</sup>
GHG emissions (Scope 2: Energy-origin CO <sub>2</sub> ) (10,000 metric tons, NGK Group)	43.0	39.4	44.9	48.7		52.0	54.5	56.4	49.2	32.5	30.6	31.9
GHG emissions (Scope 3) (10,000 metric tons, NGK Group)	—	—	—	—		(87.7)* <sup>3</sup>	(104.7)* <sup>3</sup>	(97.7)* <sup>3</sup>	(89.3)* <sup>3</sup>	344.9	351.9	327.0
Total water usage (10,000 m <sup>3</sup> , NGK Group)	318.2	276	285	409		432	453	433	378	433.6	414.3	422.6
VOC emissions (metric tons, NGK Group)	5	6	7	155		145	145	68	83	77	107	88
PRTR substance emissions (metric tons, NGK Group)	14	15	14	163		154	128	76	89	84	110	92
Total water discharge (10,000 m <sup>3</sup> , NGK Group)	223	196	197	279		287	281	314	253	274	268	271
Waste emissions (10,000 metric tons, NGK Group)	4.2	5.7	5.9	5.9		5.9	5.8	5.4	4.6	5.4	4.7	4.8
Number of employees (persons, non-consolidated)	3,531	3,569	3,700	3,937		4,142	4,119	4,224	4,316	4,382	4,547	4,775
Employee breakdown (female) (%), non-consolidated)	13.3	12.9	12.6	12.7		12.5	12.6	12.8	13.0	12.9	12.7	13.0
Rate of female managers (%), non-consolidated)	1.5	1.8	1.8	1.9		2.0	2.2	2.9	3.0	3.4	3.8	3.7
Rate of female managers (%), overseas NGK Group companies)	—	—	16.6	15.3		21.0	16.0	20.2	22.7	23.1	19.4	21.3
Number/rate of disabled employees (persons/%, non-consolidated)	53 (2.07)	56 (2.23)	56 (2.18)	55 (2.03)		57 (1.90)	62 (1.92)	135 (2.20)	145 (2.35)	155 (2.46)	160 (2.43)	172 (2.55)
Lost time incident rate (non-consolidated)* <sup>2</sup>	0.42	0.00	0.29	0.34		0.11	0.40	0.00	0.10	0.19	0.28	0.28
Social contribution expenditure (100 million yen, non-consolidated)	3.48	3.31	3.46	3.15		3.00	3.02	2.73	2.96	5.33	7.54	6.41
Number of directors (persons, non-consolidated)	12	12	12	13		12	12	13	11	9	9	10
Number of outside directors (persons, non-consolidated)	2	2	2	2		3	3	3	3	3	3	4
Total compensation of directors (million yen, non-consolidated)	624	581	723	803		799	698	660	715	820	678	667
Number of patents held (Japan) (non-consolidated)	2,685	2,719	2,907	3,038		3,191	3,352	3,513	3,521	3,374	3,448	3,536
Number of patents held (overseas) (non-consolidated)	3,990	3,911	4,042	4,134		4,186	4,346	4,485	4,452	4,444	4,589	4,780

Note: The values for Scope 1 and Scope 2 (CO<sub>2</sub> emissions from energy sources) were calculated by retroactively changing the emission factor for electricity (a factor that converts the amount of electricity used into CO<sub>2</sub>) from a conventional fixed value to the actual value of electricity companies for each fiscal year.

\*1 Includes offsets from carbon neutral LNG use from FY2021 onward

\*2 Aggregate for calendar years

\*3 Non-consolidated upstream



Corporate Outline/Stock Information/External Evaluation (As of March 31, 2024)

Corporate Outline

Company name	NGK Insulators, Ltd.	Consolidated subsidiaries	47
Address	2-56 Suda-cho, Mizuho, Nagoya 467-8530, Japan Telephone + (81) 52-872-7181	Equity-method affiliates	1
Established	May 5, 1919	Employees	NGK 4,775 Consolidated 19,540
Paid-in capital	70.1 billion yen	Stock exchange code	5333
Net sales	578.9 billion yen (consolidated, for FY2023)		

NGK Group Locations

NGK Headquarters, Sites, Branches, and Sales Offices

Headquarters/Nagoya Site  
Chita Site/Komaki Site/Ishikawa Plant  
Tokyo Main Office/Osaka Branch/Sapporo Sales Office/Sendai Sales Office/Hokuriku Sales Office/  
Hiroshima Sales Office/Takamatsu Sales Office/Fukuoka Sales Office

NGK Group

JAPAN

ENERGY SUPPORT CORPORATION  
KANSAI ENERGYS CORPORATION  
KYUSHU ENERGYS CO., LTD.  
HOKURIKU ENERGYS CORPORATION  
ENERGYS SANGYO CORPORATION  
AKECHI INSULATORS, LTD.  
NGK OKHOTSK, LTD.  
NGK ELECTRONICS DEVICES, INC.  
NGK CERAMIC DEVICE CO., LTD.  
NGK METEX CORPORATION  
NGK FINE MOLDS, LTD.  
NGK CHEMITECH, LTD.  
NGK FILTECH, LTD.  
NGK ADREC CO., LTD.  
NGK KILNTECH CORPORATION  
NGK LIFE CO., LTD.  
NGK YU-SERVICE CO., LTD.  
ENA ELECTRIC POWER Co., Ltd.  
ABASHIRI ELECTRIC POWER Co., Ltd.  
NR-Power Lab Co., Ltd.

NORTH AND CENTRAL AMERICA

NGK-LOCKE, INC.  
NGK CERAMICS USA, INC.  
NGK AUTOMOTIVE CERAMICS USA, INC.  
NGK METALS CORPORATION  
FM INDUSTRIES, INC.  
NGK ELECTRONICS USA, INC.  
NGK CERAMICS MEXICO, S. DE R.L. DE C.V.

EUROPE

NGK BERYLCO U.K. LTD.  
NGK CERAMICS EUROPE S.A.  
NGK EUROPE GMBH  
NGK DEUTSCHE BERYLCO GMBH  
NGK BERYLCO FRANCE  
NGK CERAMICS POLSKA SP. Z O.O.

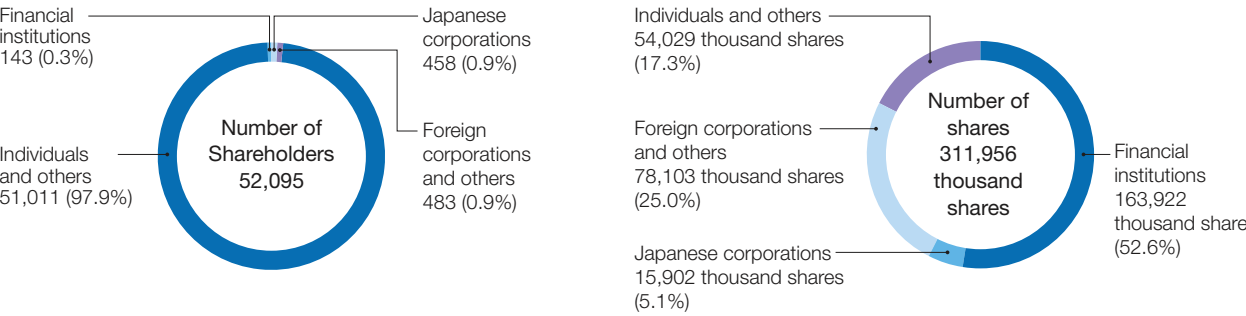
ASIA, OCEANIA

NGK (CHINA) INVESTMENT CO., LTD.  
NGK CERAMICS SUZHOU CO., LTD.  
NGK TECHNOCERA SUZHOU CO., LTD.  
NGK AUTOMOTIVE CERAMICS KOREA CO., LTD.  
P.T. NGK CERAMICS INDONESIA  
SIAM NGK TECHNOCERA CO., LTD.  
NGK CERAMICS (THAILAND) CO., LTD.  
NGK TECHNOLOGIES INDIA PVT. LTD.  
NGK STANGER PTY LTD.

Stock Information

Total number of shares authorized	Major Shareholders		
735,030,000 shares			
Total number of shares issued			
311,956,996 shares (Including 14,029,396 shares of treasury stock)			
Total number of shareholders			
52,095 persons			
Listed stock exchanges			
Tokyo Stock Exchange, Nagoya Stock Exchange			
	Names of shareholders	Number of shares held (1,000 shares)	Ratio to total (%)
	The Master Trust Bank of Japan, Ltd. (Trust account)	51,987	17.44
	Meiji Yasuda Life Insurance Company	21,695	7.28
	The Dai-ichi Life Insurance Company, Limited	21,457	7.20
	Custody Bank of Japan, Ltd. (Trust account)	18,730	6.28
	MUFG Bank, Ltd.	7,204	2.41
	National Mutual Insurance Federation of Agricultural Cooperatives	7,029	2.35
	Aioi Nissay Dowa Insurance Co., Ltd.	4,387	1.47
	BNYM AS AGT/CLTS 10 PERCENT	3,737	1.25
	JP MORGAN CHASE BANK 385781	3,384	1.13
	JPMorgan Securities Japan Co., Ltd.	3,347	1.12
Note: The Company retains 14,029,396 shares of treasury stock, but those shares are excluded from the above list of major shareholders. Furthermore, the above shareholding ratio is calculated based on the number of shares after deducting the number of treasury shares from the total number of issued shares, rounded down to the nearest one-thousandth.			

Distribution of Shares



External Recognition

In December 2023, NGK was selected to the Dow Jones Sustainability Asia Pacific Index for the eight consecutive year. This index is part of the Dow Jones Sustainability Indices, one of the leading indices for socially responsible investment. We were also selected to the FTSE4Good Index Series, an ESG investment index created by FTSE Russell. This list is comprised of companies evaluated based on criteria related to ESG. NGK was also selected to the FTSE Blossom Japan Index\*2, MSCI Japan Empowering Women Index (WIN), and the MSCI Japan ESG Select Leaders Index, all of which have all been adopted by the Government Pension Investment Fund (GPIF).



THE INCLUSION OF NGK INSULATORS IN ANY MSCI INDEX, AND THE USE OF MSCI LOGOS, TRADEMARKS, SERVICE MARKS OR INDEX NAMES HEREIN, DO NOT CONSTITUTE A SPONSORSHIP, ENDORSEMENT OR PROMOTION OF NGK INSULATORS BY MSCI OR ANY OF ITS AFFILIATES. THE MSCI INDEXES ARE THE EXCLUSIVE PROPERTY OF MSCI. MSCI AND THE MSCI INDEX NAMES AND LOGOS ARE TRADEMARKS OR SERVICE MARKS OF MSCI OR ITS AFFILIATES.

\*1 Click here for details on the FTSE4Good Index Series:  
<https://www.ftserussell.com/products/indices/ftse4good>  
\*2 Click here for details on the FTSE Blossom Japan Index:  
<https://www.ftserussell.com/products/indices/blossom-japan>