



NGK Sustainability Data Book 2021

NGK INSULATORS, LTD.

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/governance/>

The NGK Group Philosophy is a signpost that guides every employee of the NGK Group. Formulated in 2019 to mark our 100th anniversary, it encompasses our desire to use our proprietary ceramic technologies to contribute to future energy, environmental protection, and industrial progress, and to help people around the world live a happy, comfortable life.

Contents



NGK Group Philosophy / Contents	1	Governance	93
Creating Value	2	GRI Content Index	138
Message from the President	4	ISO 26000 Index	146
NGK Group Vision: Road to 2050	10	Corporate Outline	148
ESG Management	14	NGK Group	149
Values Provided by the NGK Group	16	Independent Practitioner's Assurance	150
Environmental	17	External Evaluation / Editorial Policy	151
Social	48		



Creating Value

Addressing society's challenges, developing new areas for growth

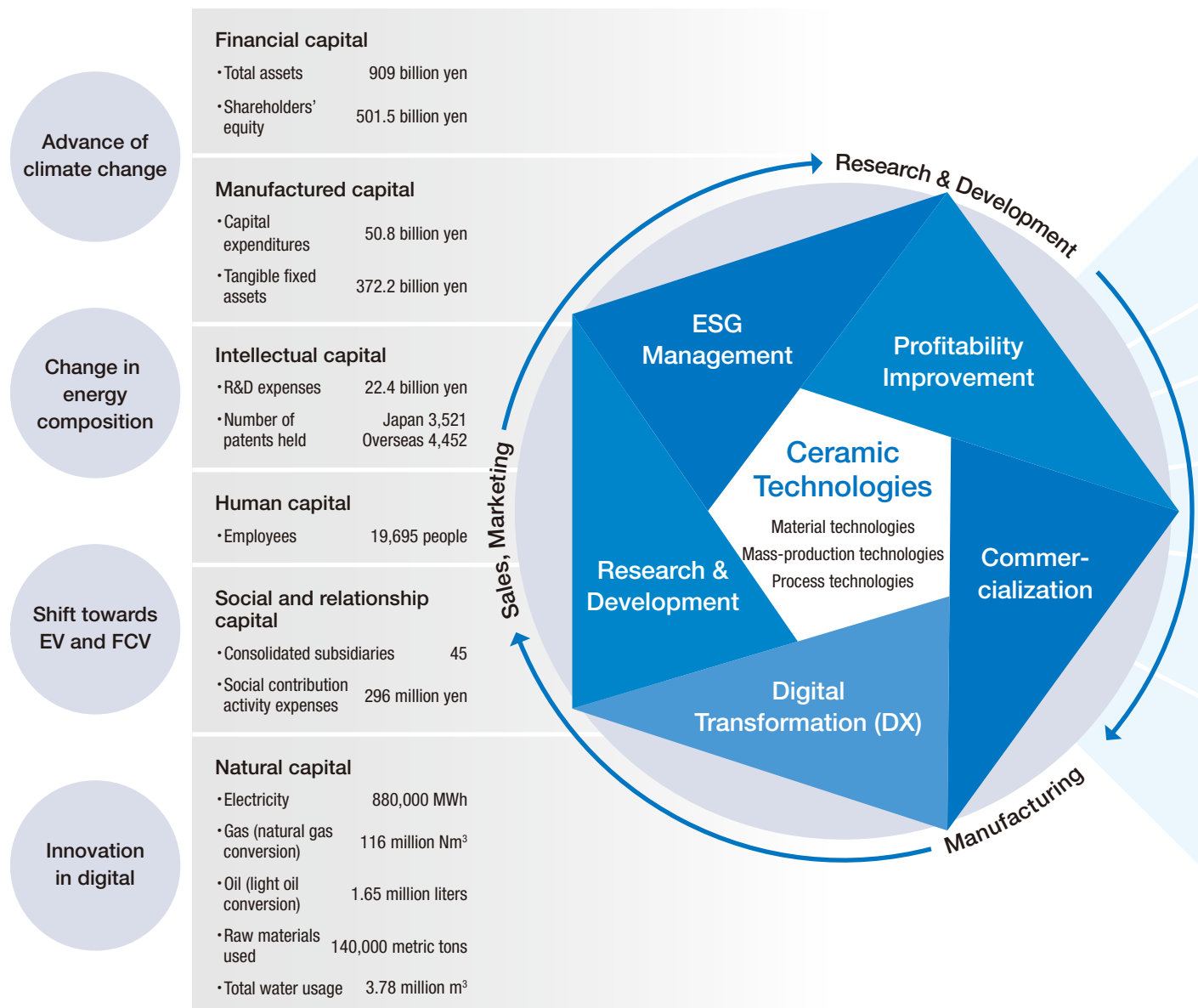
Pursuing our vision through investment in growth areas

Megatrends

Input

Fiscal 2020

Business Activities



Corporate Governance

Output

Fiscal 2020

Net sales	452.0 billion yen
Operating income	50.8 billion yen
Net income attributable to owners of the parent	38.5 billion yen
Return on equity (ROE)	7.9%

Gross profit	123 billion yen
--------------	-----------------

New product* sales ratio	30%
*Within 5 years of commercialization	

Employee satisfaction (NGK)	68%
Number of female managers (NGK)	29 people

CSR Procurement Guideline adoption rate for business partners	99.6%
Overseas students supported	
39 students from 5 countries stayed in company dormitory	
Scholarships (non-repayable) for 20 students from 10 countries	

CO ₂ emission	756,000 metric tons
Discarded materials reduction	3,000 metric tons
Sales growth for products contributing to environmental protection	144
(Figures are indexed with fiscal 2013 set at 100)	
Recycling rate	99.7%

Charting a Course Ahead

NGK Group Vision

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

Carbon Neutrality

Making clean energy more efficient

Making mobility clean and safe

Digital Society

Making smart society more comfortable

Making industries innovative



Message from the President

Contributing to carbon neutrality and a digital society under the NGK Group Vision

An era of transformation has arrived for the NGK Group. The needs and expectations of society are changing fast. As a corporate group built on pursuing solutions to social issues, we must change too. Guided by the NGK Group Vision announced in April 2021, and equipped with our unique ceramic technologies, the NGK Group is embarking on a journey of new growth.

President

Shigeru Kobayashi

Inaugural resolutions

Never lose an enterprising spirit

In December 2020, Chairman Taku Oshima—who was then President and Chair of the Nomination and Compensation Advisory Committee—offered me the position of President. I accepted right then and there. I was keen to continue the work of improving our company through the reforms that I had become familiar with during the seven years I worked alongside Chairman Oshima during his tenure as President.

Prior to my appointment, my job was to facilitate business rebuilding as the Group Executive of the Energy Infrastructure Business Group. I never imagined the position of President would be offered to me.

I joined NGK in 1983. I had always dreamed of working outside Japan, and the chance to be posted overseas was a big attraction for me.

My first role in the company was in insulator sales. After eight years, I received my first overseas posting—to Montreal, Canada. This was followed by postings to Indonesia, the United States, and China. In total, I spent nine years working abroad. Even when based in Japan, I've spent at least 120 days out of every year overseas on business trips. All this experience has taught me that, while cultures may differ, trust and reliability are universally important to business sustainability.



Message from the President

Upon having been appointed President, I set four resolutions.

The first resolution is to make good on the more than 250 billion yen in investment that we have made over the past three years. This investment—which was primarily focused on automotive-related business and semiconductor manufacturing equipment-related products—ensures that we have enough production capacity to meet future demand. It is my responsibility to make sure that this translates into greater profits.

The second resolution is to create new businesses and new products that will sustain the NGK Group into the future. In line with the NGK Group Vision, which will be described later, we will focus on new products in the two fields of carbon neutrality and the digital society.

The third resolution is to pursue globalization. Japan,

where the NGK Head Office is located, accounts for just 28% of total NGK Group sales. We have a diverse array of customers all around the world. We also have an increasingly diverse workforce spread across business sites in 20 different countries. I will engage with our customers and employees around the world to facilitate greater globalization of the NGK Group. In addition, the NGK Group will provide a work environment where all employees, regardless of nationality, have opportunities for advancement on the global stage.

The fourth resolution is to grow the NGK Group as a company that all employees are proud to work for and that all stakeholders can trust. To this end, we will create a pleasant work environment characterized by free and open discussion, where employees are empowered to tackle challenges and are stimulated creatively.

NGK Group Vision

Growing carbon neutrality and digital society-related business into 80% of all sales by 2050

In April 2021, the NGK Group released its 2050 vision in the form of the NGK Group Vision: Road to 2050. This is the first public announcement of specific long-term targets that the Group has made since the K Plan 21 was released in 1989.

The discussions that led to the formulation of this medium-to-long-term vision began immediately after the revised NGK Group Philosophy was released two years ago—at the time of the company's 100th anniversary. These discussions were centered on the four areas of energy, mobility, ICT and power devices, and industry. They

explored such questions as what society will be like in 2050, what kinds of issues society will face, and what the NGK Group can do to help address those issues. Based on this, we came up with an answer to the fundamental question of what we want to be as a company. Our answer, which underlies the NGK Group Vision, was: 'A company that contributes to carbon neutrality and the digital society with our unique ceramic technologies.' The discussions involved top management as well as a diverse cross-section of employees.

From company foundation to the present, offering value to society through SDG ideas



Lithium-ion rechargeable batteries, "EnerCera®"



Insulators



NAS® batteries



Gallium nitride (GaN) wafers



Subnano-ceramic membranes



Particulate matter (PM) removal filters



Reference URL Envisioning SDGs from 100 years ago

<https://www.ngk-insulators.com/en/sdgs/>

NGK came into being 100 years ago in response to the challenge of spreading electricity throughout Japan. Since then, our products and technologies have continued to address society-wide issues such as air pollution and increasing digitization. Examples of our technologies include ceramics for purifying automobile exhaust and ceramics for semiconductor manufacturing equipment. Central to all challenges we have undertaken is the unique ceramic technologies that we have been refining for a century. Now we are working to leverage our three strengths in materials, processes, and mass production to enable the NGK Group to deliver new original products and create new businesses in the two areas of carbon neutrality and digital society.

We see a competitive carbon neutrality market is beginning to emerge around the world. The NGK Group already has an established track record of research into relevant technologies, like storage batteries, subnano-ceramic membranes for CO₂ separation, and solid oxide electrolysis cells (SOEC). We see these technologies being used to make products that will drive new growth for the Group. In the future, we aim to establish a carbon cycle that uses CO₂ collected through subnano-ceramic membranes—along with renewable energy—to synthesize hydrogen and carbon monoxide via SOEC and then process it into fuel and chemical products using honeycomb structural reactors.

In digital society-related markets, the NGK Group already has competitive strengths. Semiconductor manufacturing equipment incorporates ceramic components, which is an area where the NGK Group and other Japanese corporate groups are strong. We will capitalize on these advantages to continue meeting the needs of customers, while also developing and offering new products.

Our plan is to develop this trend such that 50% of total sales by 2030—and 80% of total sales by 2050—come from products related to carbon neutrality and digital society. Achieving this will require strong, new products

that will be the cornerstone of the NGK Group. Therefore, over the next 10 years, we will invest 300 billion yen into research and development, with 80% of that being allocated to research and development related to carbon neutrality and the digital society.

Demand for ceramics used in purifying automobile exhaust, one of our current core businesses, is not going to drop off rapidly. Moving forward, we will use the profitability of this business to fund new product and business development.

In terms of concrete policies to realize this new vision, we have formulated Five Transformations. These are ESG (Environmental, Social, and Governance) Management, Profitability Improvement, Research and Development, Commercialization, and Digital Transformation (DX). We must strive for a major transformation, particularly regarding the speed with which we go from Research and Development to Commercialization. All processes involved between development and commercialization require transformation. Along with working on selection and concentration, we will work to improve the efficiency of materials development through the application of DX—for example, using materials informatics*.

In addition, we recognize the need for greater emphasis on not only tangibles but also intangibles—that is, on providing services and solutions as well as products. One example of this is shifting from our traditional approach of selling products that reduce CO₂ to engaging in businesses capable of reducing CO₂ emissions. We will provide those customers who want more than physical products with services whose functionality is derived from our unique ceramic technologies. This represents one of the innovative schemes that we must put into action.

The NGK Group is currently undergoing its third foundational period. We will work together as one with all stakeholders, both inside and outside the Group, to bring about the NGK Group Vision.

* A method for material development using information processing technologies such as big data, AI, and machine learning.

ESG in the NGK Group

Newly formulated NGK Group Environmental Vision

Within the NGK Group Vision, ESG management plays a central role in Group management. However, in my view, it is the 'E' (Environmental) that is most fundamental to the success of ESG management. Thus, when we formulated the NGK Group Vision, we also formulated the NGK Group Environmental Vision. This ambitious vision seeks, among other things, a reduction in our CO₂ emissions by fiscal 2030 to levels 50% below those of fiscal 2013. Eventually, our goal is to achieve net zero CO₂ emissions in our own activities by 2050.

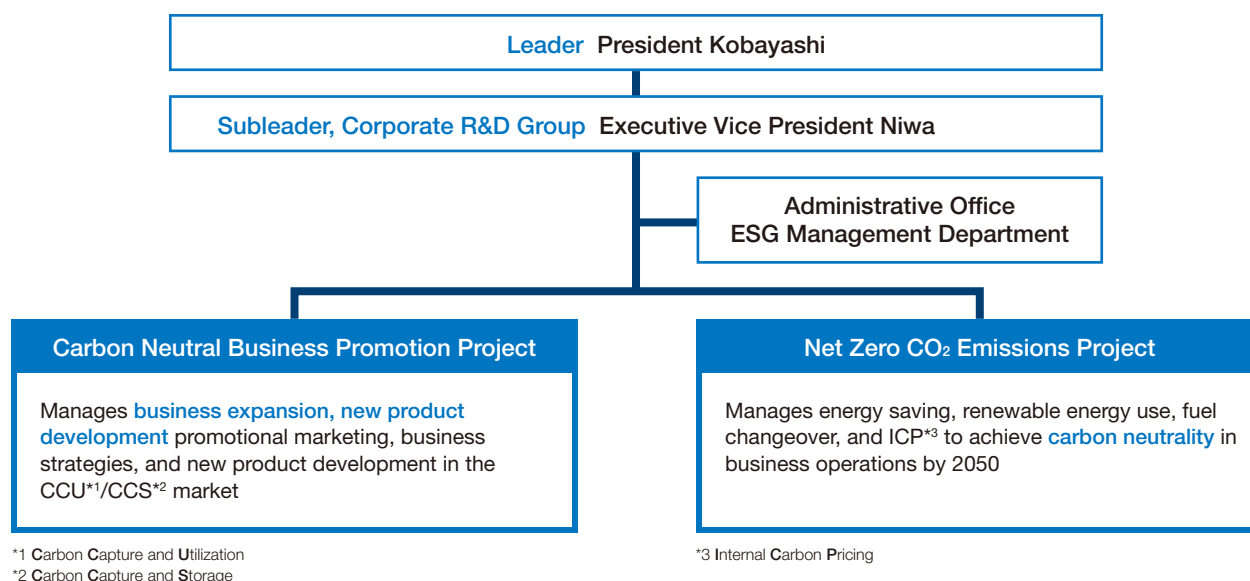
Although one of the corporate strengths of the NGK

Group is its environmentally friendly products, the firing process used to produce ceramics requires large amounts of electricity and fuel. CO₂ emissions are an unavoidable byproduct. Therefore, we will reduce our CO₂ emissions while pursuing technological innovation and collaborating with society.

The capital investment associated with this needs to begin now if we want to meet our targets for fiscal 2030. That is why I am heading up a Carbon Neutral Project, which will accelerate a changeover to alternative fuel sources, such as hydrogen and ammonia.

Message from the President

Launch of the CN (Carbon Neutral) Project



As for the 'S' (Social) in ESG, in April we formulated the NGK Group Human Rights Policy. To ensure that the human rights of all people involved in the NGK Group are not violated, we will comply with international standards of human rights and provide opportunities for everyone to play an active role, regardless of their gender or nationality.

And as for the 'G' (Governance), a resolution was passed at the General Meeting of Shareholders in June 2021 that increased the ratio of independent outside directors on the Board of Directors to one-third (three out of nine). This also represents an opportunity to further separate our supervisory and executive functions.

We are also working to ensure that assignments to

senior management positions are carried out regardless of nationality or gender. We have appointed an American executive officer for 2021, and we also appointed a female executive officer for 2020.

A company that loses the trust of society cannot survive. Compliance is the top operational priority. To boost our operations to world-class standards across the board, we introduced our NGK Group Basic Guidelines for Compliance Activities. Based on the shared values and understanding of the NGK Group presented in these guidelines, we will undertake compliance activities that always conform to the international standards.

Results for the fiscal year ended March 2021

Securing increased revenue from a recovery in automotive and semiconductor-related business

Despite the impact of the COVID-19 pandemic, the fiscal year ended March 2021 saw a quick rebound in automobile sales, centering on China, and strong growth in demand for semiconductor manufacturing equipment. As a result, sales revenue increased and year-on-year operating income declined by only 8%. We were able to continue supplying our products, thanks to stringent infection-control measures taken by employees at our production facilities in and outside Japan.

In the fiscal year ending March 2022, we anticipate a continuation of this automotive and semiconductor-related growth, as well as greater activity associated with new

products. Regarding our EnerCera[®] lithium-ion rechargeable batteries, we are already working with more than 300 other companies and expect to see significant growth once the business model is established. As for our zinc rechargeable batteries, this fiscal year we plan to continue demonstration followed by commercialization. And from next fiscal year, we plan to start selling zinc batteries for specific applications to a limited number of customers. Soon we hope to see a successful conclusion to the demonstration testing of our subnano-ceramic membranes, which has been taking place in Texas, U.S.

Towards the future

Converting our business structure in anticipation of a Third Foundation

In conjunction with the formulation of the NGK Group Vision, an organizational restructuring was undertaken this past April. Of particular note is the establishment of the ESG Management Department, which brings together various ESG-related functions that had previously been divided among several different departments. This department will implement ESG-related activities across the entire Group, while also proactively communicating ESG-related efforts. Also, a Digital Transformation and Innovation Department was established, which brings together digital-related IT departments and others, to facilitate DX. These two departments are responsible for handling the question of how employees' jobs will change. We are working to cultivate leaders who will provide support for this change process.

To bring about the NGK Group Vision, every employee must be motivated to tackle the challenges of transformation without fear of failure. We must all take part in free and open discussion. The NGK Group's corporate culture is sober, technologically oriented, and at times somewhat risk-averse. But we must remember that trial and error is the only way to break new ground. We come up with a hypothesis; we test it; and, if it is wrong, we redo it. Nothing is ever perfect right from the start. We are building an ambitious company that does not fear failure. And it is in this context—and in line with our Group slogan of 'Surprising Ceramics.'—that we are pursuing the Five Transformations and converting our business structure in anticipation of our Third Foundation driven by NGK's unique ceramic technologies. Expect to see great things in the NGK Group's future.



NGK Group Vision: Road to 2050



NGK Group Vision: Road to 2050

Pursuing the ‘5 Transformations’ that will make us ‘what we want to be’ in 30 years

The NGK Group Vision announced in April 2021 presents a picture of ‘what we want to be’ by 2050 along with the path we will take to get there.

For NGK, 2021 is the year of our ‘Third Foundation’ as we pursue the self-transformation that will enable us to realize our vision.

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

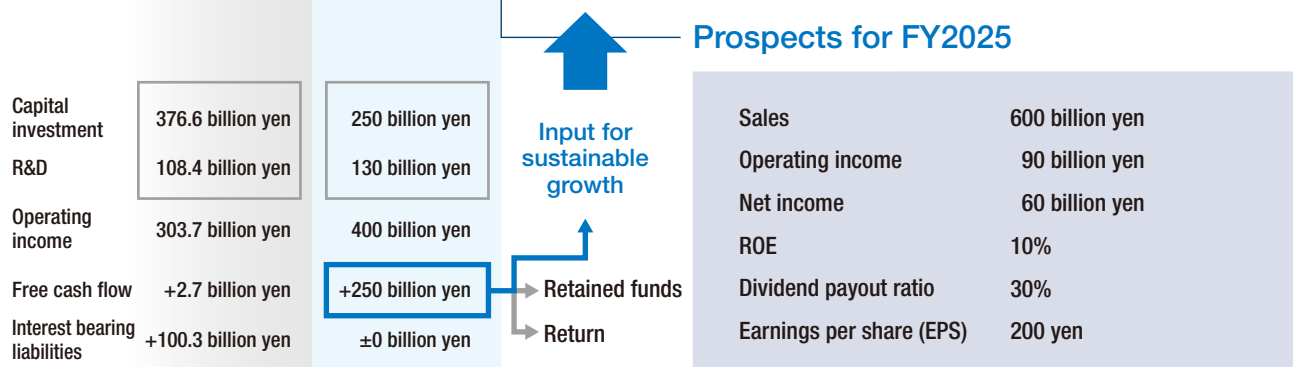
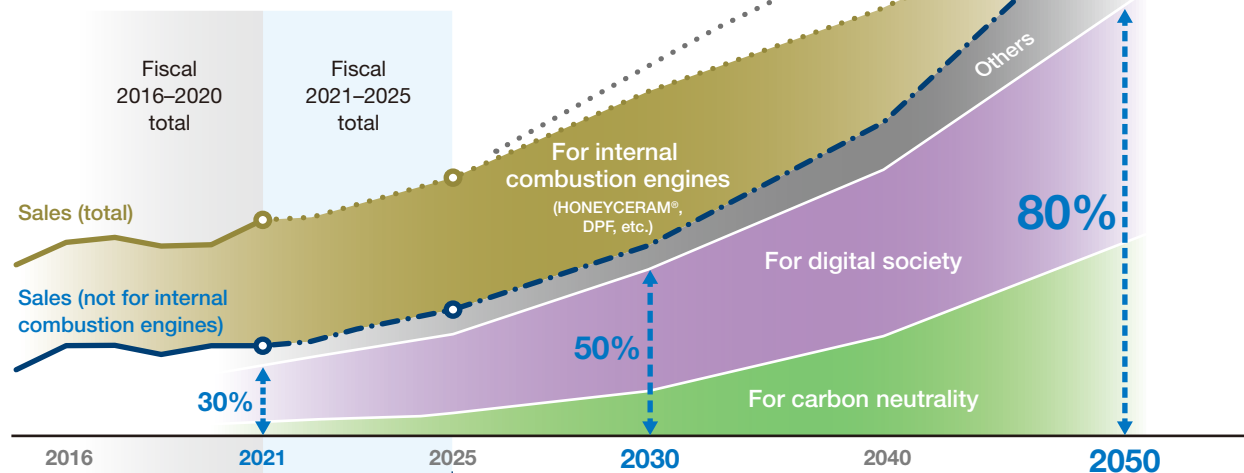
Achieve 80% of sales from CN/DS

(Carbon Neutrality/Digital Society)

In expectation of carbon neutrality and digital society being our growth areas in the future, we are pursuing business transformations that will ensure products related to these areas account for 80% of our sales by 2050.

Demand for internal combustion engine remained scenario

Zero scenario



Backcasting from the envisioned society of 2050

Since our foundation in 1919, we have been promoting business diversification and global expansion in the aim of contributing to the resolution of social issues as the times change.

Currently, carbon neutrality in 2050 is recognized as a global challenge. In addition, it is certain that digitalization will progress rapidly in the future. In formulating our medium-to-long-term vision, we imagined a society of 2050. Then, we positioned carbon neutrality and the digital society as social issues we should tackle on.

Backcasting from there, we considered what we need to

work on. We will continue to contribute to society with our unique ceramic technologies at our core. In order to do so, it is necessary to refine the technologies and raise the level. Next, to commercialize, it is essential to make a major change in management and the way we offer our products. Therefore, we have defined the current situation as the 'Third Foundation' and will work on self-transformation. We will contribute to society through our business by realizing what has previously been difficult with ceramic technologies at the core, and by working to the point where the key devices are implemented in society.

NGK Group Vision: Road to 2050

5 Transformations

For the NGK Group, the following '5 Transformations' represent 'what we must do' in order to become 'what we want to be.'

ESG as a foundation of management

E NGK Group Environmental Vision:
Contributing to achievement of
CN through products and services
Realizing net zero CO₂ 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'

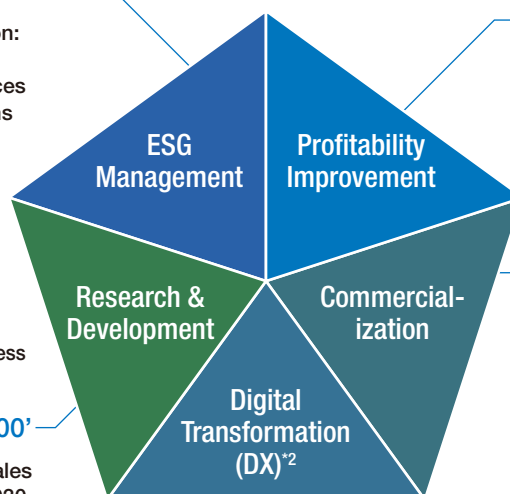
- Attain more than 100 billion yen of sales in newly launched businesses*¹ in 2030
- Investment of 300 billion yen in R&D over the next 10 years
- Concentration in the CN and DS areas (80%)

*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 30)



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

ESG Management

The central management focus moving forward will be contributing to society—as a member of society—through our business. In particular, with regard to E (environment), we have formulated the 'NGK Group Environmental Vision' along with the 'NGK Group Vision.' In that Environmental Vision, we stipulate our targets as contributing to carbon neutrality through products and services as well as achieving net zero CO₂ emissions in our own activities by 2050.

Profitability Improvement

Regarding improvement in earning power, we are going to take on the following initiatives:

- Generating cash by securely increasing our earning power over the next five years as explained earlier
- Instilling management utilizing ROIC and analysis and improvement of profitability in each business within the entire NGK Group
- Starting new actions in production processes to continue to reinforce our strengths as a manufacturer

Research & Development

We will aim and work on to create a business with sales of 100 billion yen by 2030 through new business development, which we call 'New Value 1000.' In order to achieve this, we will invest 300 billion yen in R&D over the next 10 years with 80% allocated to carbon neutrality and digital society.

Commercialization

In order to make ceramic products born from our strength more widely used in society, we will focus on expanding to solution business, not limited to just selling things, by improving our marketing capabilities and expanding collaboration with the outside partners.

Digital Transformation (DX)

We will use the power of digital to accomplish the above business transformation.

New value to be provided by NGK

For Carbon Neutrality

For carbon neutrality, separation and capture of CO₂ have been challenges. By using our ceramic membranes, it is possible to separate and capture specific gases with high precision and stability at the molecular level. Zinc rechargeable batteries using unique ceramic separators and water solutions as the electrolyte can be used safely indoors without the risk of fire accident.

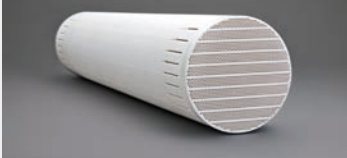
Furthermore, as future products, we will develop the followings;

- SOEC, a solid oxide electrolysis cell that can produce fuels and raw materials with high efficiency from CO₂ and water.
- Honeycomb structural reactors, which make reactions of synthetic fuel highly efficient by utilizing large-scale ceramics extrusion technology and separation membrane technology.

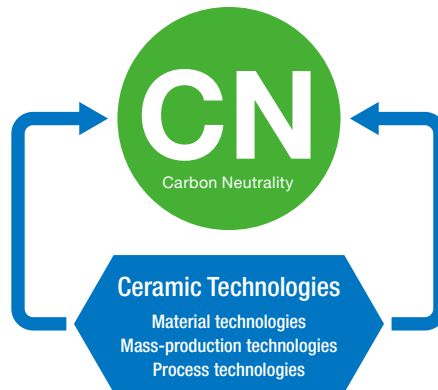
New products

Under harsh usage, realizing high-precision separation and capture of CO₂

Subnano-ceramic membranes



Large ceramic membranes that can separate CO₂ at the molecular level with our unique hydrothermal synthesis technologies



As there is no risk of fire accidents, they can be installed indoors and safely realize emergency power supply and renewable energy utilization

Zinc rechargeable batteries



High-safety and high-capacity storage batteries using our proprietary ceramic separators and water solutions as the electrolyte

For Digital Society

We will contribute to agendas such as the expansion of the IoT and advanced security with our ultra-thin batteries. These batteries combine high-temperature endurance, high capacity, and low resistance properties that were previously difficult to realize. We commercialized them thanks to our crystal control technologies. They are expected to be utilized in weak power supplies and applied in smart cards and wearable devices. Meanwhile, our advanced wafers, which are manufactured

using unique, ultra-high precision-polishing and bonding technologies, facilitate the precise and powerful filtering capabilities required of 5G and successor next-generation, high-speed communications networks. We will utilize our high precision technologies of ceramics for the development of future products. For example, mobility sensors that contribute to autonomous driving technology and also bonded wafers that realize miniaturization of devices and ultra-high-speed communications.

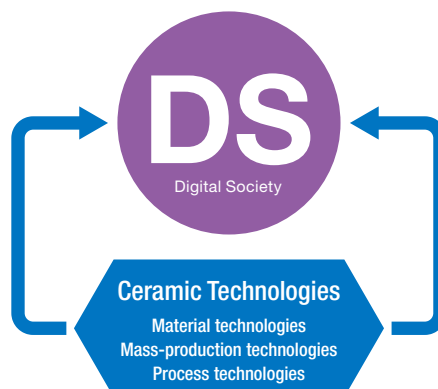
New products

- Realizing a maintenance free IoT
- More secure smart cards
- Wearable devices closer to our life

EnerCera®



Highly heat-resistant, high-capacity, high power, fast-charging and ultra-small and thin batteries utilizing our unique crystal-orientation control



Contribution to 5G and next-generation telecommunications networks with high speed and high data capacity

Wafers



Highly functional bonded wafers realized by our unique precision-polishing and bonding technologies

ESG Management

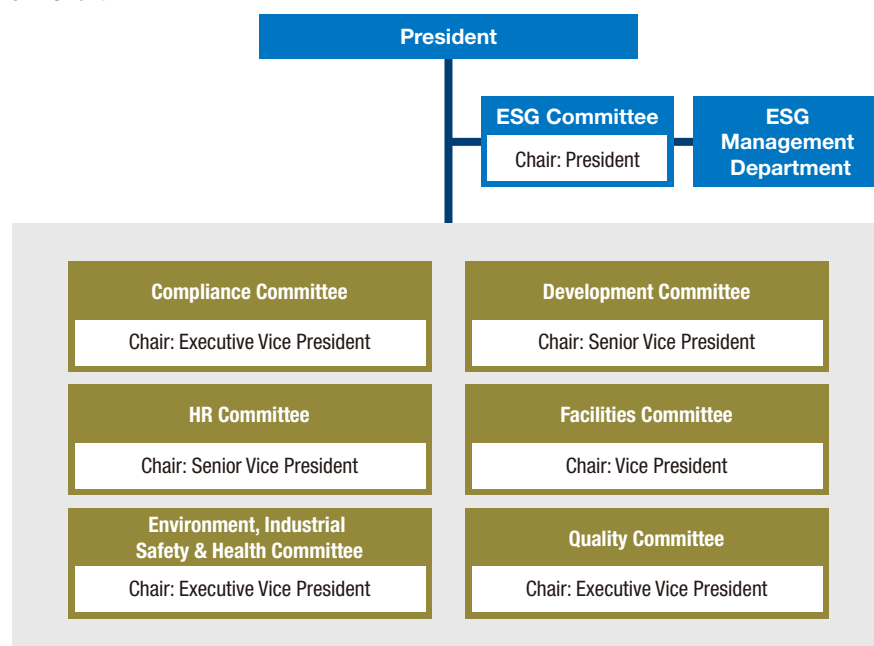
To help realize the Sustainable Development Goals (SDGs) adopted by the United Nations, the NGK Group seeks to provide new value to society with our unique technologies, thus contributing to the realization of a sustainable world and winning positive expectations and trust among society. All those who work in the NGK Group respect human rights and comply with the law by acting on a foundation of fair values and internationally recognized norms of judgment.

ESG Action Framework

ESG is central to the management of the NGK Group. Amidst ongoing overseas business expansion, we seek to ensure greater managerial transparency and autonomy within an environment which cultivates within every member of the NGK Group a sense of fairness accompanied by decision-making and action which accords with international norms.

In April 2019, the ESG Committee was established as a body for information sharing, opinion exchange and policy discussion among senior management, and this has now been followed by the establishment of the ESG Management Department in April 2021 in order to handle lateral implementation of ESG-related activities across the NGK Group and to strengthen information dissemination about the activities.

ESG Action Framework Chart



Fiscal 2020 ESG Committee Achievements

1st	April 27, 2020	<ul style="list-style-type: none"> ● Decisions on fiscal 2020 action plans and key themes
2nd	July 7, 2020	<ul style="list-style-type: none"> ● ESG seminar by outside experts ● Discuss governance system
3rd	September 25, 2020	<ul style="list-style-type: none"> ● Formulate NGK Group environmental vision ● Discuss governance system
4th	October 29, 2020	<ul style="list-style-type: none"> ● Study social contribution activities
5th	December 22, 2020	<ul style="list-style-type: none"> ● Plan ESG information disclosure and integrated report (NGK Report 2021) ● Evaluate research and development topics from an SDGs perspective ● Tabulate ESG activity-related capital investment ● Study carbon neutrality-focused capital investment
6th	February 25, 2021	<ul style="list-style-type: none"> ● Discuss Board of Directors, Executive Committee ● Global warming task force report
7th	March 19, 2021	<ul style="list-style-type: none"> ● Discuss NGK Group Environmental Vision and new Five-Year Environmental Action Plan ● Develop NGK Group human rights policy

Key ESG Activity Themes

At the first ESG Committee session in fiscal 2021, we decided on the key action themes for the fiscal year.

Key themes	Main activities	Activity leader
Carbon neutrality	<ul style="list-style-type: none"> ● Pursue CCU/CCS (CO₂ capture, utilization, and storage) market business expansion and new product development ● Net zero CO₂ emissions-focused ICP, energy efficiency, fuel changeover, renewable energy use 	CN Project
Climate change countermeasures	<ul style="list-style-type: none"> ● Plan specific action on TCFD (governance, strategy, risk management) 	Task force
Revamping of governance system	<ul style="list-style-type: none"> ● Strengthen supervision functions of Board of Directors ● Corporate governance code compliance 	Task force
Supply chain expansion	<ul style="list-style-type: none"> ● Expand CSR procurement ● Promote human rights activities 	Task force
Community service activities	<ul style="list-style-type: none"> ● Promote social contribution activities within the Group 	Task force

Note: Task forces are project teams comprising members of relevant business divisions.

NGK Group Signs UN Global Compact

The NGK Group is a signatory to the United Nations Global Compact, which advocates for independent action on the part of companies. We believe that addressing a broad range of social problems through our business activities, while measuring progress against indicators such as the SDGs, is an important corporate social responsibility.

The UN Global Compact is a global framework for realizing sustainable growth through companies and organizations acting as good members of society.



Position on SDGs

Ever since its foundation, the NGK Group has pursued business in the energy, ecology, and electronics sectors in efforts to keep nature's air and water clean and thus help people live a comfortable, healthy life. Many of our technologies and products contribute to the SDGs, and we will continue to provide new value by leveraging our unique ceramic technologies towards the realization of a sustainable society.



Values Provided by the NGK Group

	Goals	Values provided by the NGK Group
	End poverty in all its forms everywhere	<ul style="list-style-type: none"> • Creating appropriate employment helps to end poverty • NGK's climate change countermeasures help mitigate natural disasters
	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	<ul style="list-style-type: none"> • The social infrastructure created by NGK products helps secure equal access to work opportunities
	Ensure healthy lives and promote well-being for all at all ages	<ul style="list-style-type: none"> • High-output, high-efficiency semiconductor lasers using gallium nitride (GaN) wafers are a substitute for ultra-high-pressure mercury lamps, thus contributing to less use of mercury • Micro-lenses are increasingly used instead of mercury in UV LED light sources for applications such as the sterilization of water and air, thus contributing to less use of mercury • Ceramics for purifying automobile exhaust make exhaust gas clean
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	<ul style="list-style-type: none"> • Creating appropriate employment gives people the chance to have equal access to education
	Achieve gender equality and empower all women and girls	<ul style="list-style-type: none"> • The social infrastructure created by NGK products helps provide more opportunities for women to enhance their abilities • Securing equal opportunities for women to participate and be leaders in society
	Ensure availability and sustainable management of water and sanitation for all	<ul style="list-style-type: none"> • Ceramic membrane filters provide highly safe water • Ceramic membrane filters purify wastewater
	Ensure access to affordable, reliable, sustainable, and modern energy for all	<ul style="list-style-type: none"> • Insulators are indispensable to stable power supply • NAS[®] batteries allow stable supply of renewable energy • Ceramics for purifying automobile exhaust make exhaust gas clean, thus enabling clean usage of fossil fuels
	Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all	<ul style="list-style-type: none"> • Creating appropriate employment and providing employees with a satisfying work environment contributes to economic growth
	Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation	<ul style="list-style-type: none"> • Thin lithium-ion rechargeable batteries provide power for the new IoT generation • Ceramics used in electronics make ICT cheap and ubiquitous • Ceramics used in semiconductor manufacturing equipment let the semiconductor industry be the foundation for modern daily life • Metal-related products are widely used in mobile phones, automobiles, industrial equipment, and other devices that undergird modern life
	Reduce inequality within and among countries	<ul style="list-style-type: none"> • We prevent discrimination and take prompt and appropriate action when violations occur
	Make cities and human settlements inclusive, safe, resilient, and sustainable	<ul style="list-style-type: none"> • NAS batteries enable innovation in urban energy management for the creation of sustainable cities
	Ensure sustainable consumption and production patterns	<ul style="list-style-type: none"> • We efficiently use the natural resources used to make ceramics
	Take urgent action to combat climate change and its impacts	<ul style="list-style-type: none"> • NAS batteries aid in the fight against climate change by allowing stable supply of renewable energy
	Conserve and sustainably use the oceans, seas, and marine resources for sustainable development	<ul style="list-style-type: none"> • Ceramic membrane filters purify wastewater to prevent marine pollution
	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	<ul style="list-style-type: none"> • We protect biodiversity on land owned by NGK
	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable and inclusive institutions at all levels	<ul style="list-style-type: none"> • We comply with the rules and regulations of the countries and regions in which do business, and ensure respect for and strict compliance with international treaties
	Strengthen the means of implementation and revitalize the global partnership for sustainable development	<ul style="list-style-type: none"> • We encourage and promote effective partnerships among governments, corporations, and society as a whole

Environmental

NGK Group Environmental Vision	18
Environmental Report / NGK's Core Policy on the Environment	20
Five-Year Environmental Action Plan	23
Environmental Risk Management	26
Environmental Accounting	28
Environmental Performance	29
Climate Strategy / Initiatives Toward Carbon Neutrality	31
Initiatives for a Recycling-Oriented Society	37
Initiatives to Promote Greater Harmony with Nature	39
Creating Products That Contribute to the Environment	41
Environmental Education and Communication	45

NGK Group Environmental Vision

To help realize the Sustainable Development Goals (SDGs) adopted by the United Nations, the NGK Group seeks to provide new value to society with our unique technology, thus contributing to the realization of a sustainable world and winning positive expectations and trust among society. The NGK Group Vision (announced in April 2021) outlines the kind of entity NGK strives to become by 2050 and stresses ESG management as a key reform towards realization. To this end, based on the NGK Group Vision and towards responding to society's expectations and trust, in April 2021 we formulated the NGK Group Environmental Vision.

NGK Group Environmental Vision

The NGK Group will contribute to the realization of society's direction toward "carbon neutrality," "a recycling-oriented society," and "harmony with nature" through its business activities.

Toward carbon neutrality

We will develop and provide products and services that contribute to the realization of a carbon-neutral society and apply them to our own business activities in order to achieve our goal of net zero CO₂ emissions by 2050.

Toward a recycling-oriented society

We will contribute to the realization of a recycling-oriented society by reducing our natural resource consumption and developing and providing resource-efficient products.

Toward harmony with nature

We will minimize our environmental impact on ecosystems and raise stakeholder awareness through educational activities in order to achieve harmony with nature.

Carbon Neutrality Strategic Roadmap

The NGK Group has drawn up its Carbon Neutrality Strategic Roadmap as a working guide to realizing the goals of the NGK Group Environmental Vision.

We have established a Group-wide target of net zero CO₂ emissions by 2050, with milestone targets along the way of 550,000*¹ metric tons by fiscal 2025 (a reduction of 25% compared with the fiscal 2013 base year) and 370,000 metric tons by fiscal 2030 (a reduction of 50% compared with the fiscal 2013 base year). And to help society as a whole become carbon neutral, we are working to develop and provide the use of relevant products and services. In the future, we will consider advancing our efforts to achieve net zero by promoting the development of hydrogen/CCU/CCS*²-related technologies.

In order to realize our NGK Group Environmental Vision, we have adopted the following four strategies.

Strategy 1: Development and provision of carbon neutrality (CN)-related products/services

In addition to pursuing our existing carbon neutrality (CN)-related products, we will also work to develop and commercialize new products as well as offer society NAS battery-driven renewable energy supply business and other relevant services.

Strategy 2: Top-down enhancement of energy-saving

We will work to further enhance our existing energy-saving activities, as well as introduce high efficiency equipment and facilities and more energy-efficient operations.

Strategy 3: Promotion of technical innovation

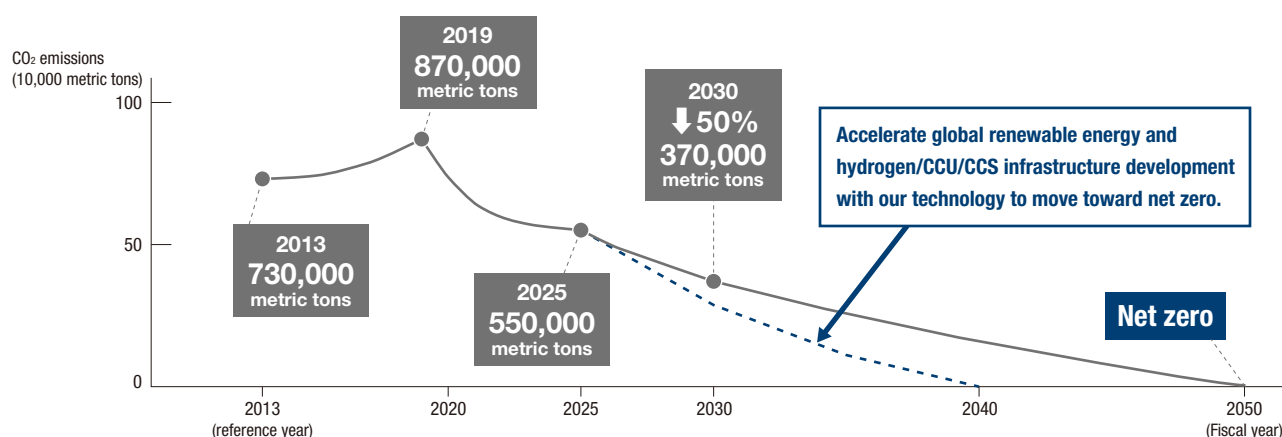
Although the ceramic calcining process requires fossil fuel which is responsible for CO₂ emissions, we will work to switch over to hydrogen, ammonia and other fuels that will allow us to become fossil fuel-free.

Strategy 4: Expanded use of renewable energy

In addition to promoting various renewable energy procurement strategies both within Japan and overseas, we will install photovoltaic power generation systems at manufacturing sites within the NGK Group, and use them in conjunction with NAS batteries and zinc rechargeable batteries, to achieve demand control. We will use this as a model case in NGK Group's renewable energy business, and work towards the goal of enabling all energy demand within the NGK Group to be met through renewable energy.

*1: Emissions are a revision of the calculation standard. Specifically, the power emission factor (coefficient for converting power consumption into CO₂) will be changed from the conventional fixed value to the actual value of the power company every year.

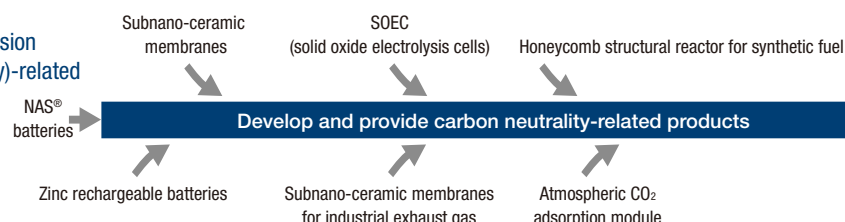
*2: Abbreviation for Carbon dioxide Capture and Utilization and Carbon dioxide Capture and Storage.



Strategy 1

Development and provision of CN (carbon neutrality)-related products/services

CCU/CCS/hydrogen related and renewable-energy related



Strategy 2

Top-down enhancement of energy-saving

Accelerate capital expenditures by introducing in-house carbon prices

Introduction of high-efficiency equipment (low-temperature waste heat recovery)

DX for productivity increase and energy management

Strategy 3

Promotion of technical innovation

Fuel conversion to hydrogen, etc. and own verification/application of CCU/CCS

Technical development

Application to production equipment

Strategy 4

Expanded use of renewable energy

Own photovoltaic power generation installation utilizing NAS batteries/zinc rechargeable batteries and renewable energy procurement

Photovoltaic power generation installation

Explore and implement new business models

Environmental Report / NGK's Core Policy on the Environment

Scope of Application

In addition to promoting the development and popularization of products and services that can help protect the environment, the NGK Group is endeavoring to preserve the global environment by improving manufacturing processes and developing and introducing manufacturing technology that has less environmental impact.

Activities covered

All NGK Group sites

- NGK Headquarters, Nagoya Site, Chita Site, Komaki Site, Ishikawa Plant, Tokyo Main Office, Osaka Branch, and six other sales offices
- Group companies: 45 consolidated subsidiaries

NGK's Core Policy on the Environment*

Recognizing that protecting the environment is a vital issue that all of humanity must face, the NGK Group formulated its Core Policy on the Environment in April 1996 in order to bring its corporate activities into harmony with the environment. Based on the NGK Group Environmental Vision announced in April 2021, we will promote initiatives to contribute to carbon neutrality, a recycling-oriented society, and harmony with nature. On the basis of this policy, the NGK Group works to reduce the environmental impact of business activities, and actively strives to help protect the environment by developing products and technologies to that end.

* Revised in April 2021

Guidelines for Environmental Action

1. Strive to develop, design, and manufacture products that contribute to the environment and products with low environmental impact.
2. Work to reduce the environmental impact arising from business activities. Conduct design reviews to scientifically study and evaluate the environmental impact of business activities.
 - Promote energy conservation measures and expand the use of renewable energy for all processes and facilities, and make efforts to control CO₂ emissions.
 - Promote resource saving and recycling, and make efforts to control the generation of by-products.
 - Manage the risks of water resources and strive to make effective use of water in our business activities.
 - Through the appropriate use and control of chemical agents, work to reduce the risks inherent in toxic substances.
 - Give precedence to environmentally friendly materials, parts, products, and facilities in procurement and purchasing, strengthening cooperative alliances with our business partners.
3. Enhance environmental management systems from a global perspective while continuously reducing our environmental impact.
4. Not only abide by environmental laws, regulations, and other requirements, but also institute voluntary standards and work to improve our own environmental conservation.
5. Provide environmental information to the public at the appropriate time and pursue dialogue with all stakeholders. Proactively develop social action programs. Also, engage in education and publicity in order to improve employees' environmental consciousness.

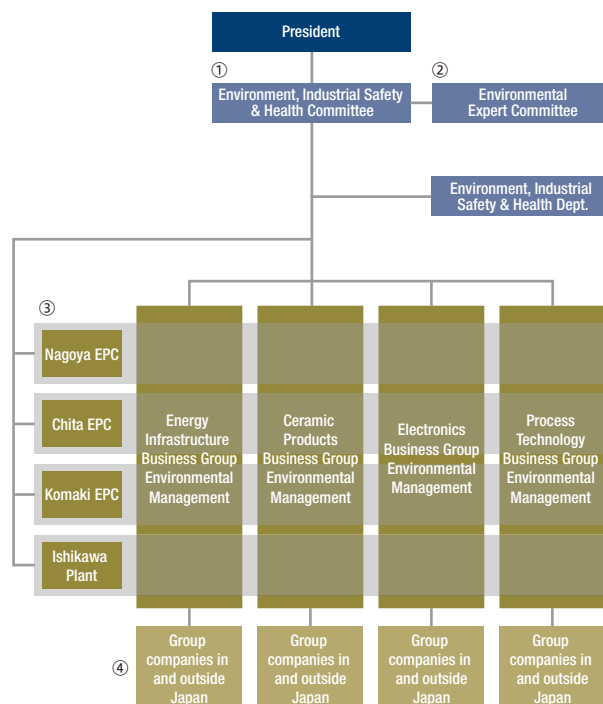
Environmental Management System

The NGK Group promotes environmental conservation activities in accordance with our Core Policy on the Environment through initiatives pertaining to environmental management frameworks and the Environmental Management System (EMS) implemented by global Group companies working in conjunction with one another.

Environmental Management Promotion System

In addition to environmental management systems built independently at each site of NGK (Nagoya, Chita, Komaki, Ishikawa), we have established a consolidated management system to control environmental activities at all Group companies in and outside Japan under the leadership of each Business Group. The Five-Year Environmental Action Plan and the related annual plan are shared across the entire Group via the Business Groups to be incorporated into activity plans of each Group company.

To promote unified environmental management for the entire Group, annual liaison meetings are held for Group companies in Japan, while headquarters personnel audit Group companies in and outside Japan on a regular basis. Thus, we create interactive discussion and support opportunities to address issues facing each company.



① Environment, Industrial Safety & Health Committee

In principle, this committee meets twice each year. Other meetings are held at the discretion of the chair.

Governing Structure

Chair	President appoints the chair in light of Executive Committee deliberations (As of July 2021, Executive Vice President)
Vice Chair	Appointed by Committee Chair (As of July 2021, General Manager of Environment, Industrial Safety & Health Dept.)
Members	Executive Vice President, Corporate Officers in charge of Head Office and Business Divisions, Vice Presidents responsible for Headquarters Departments, Group Executives, General Managers, Director of each site (General Manager of Pollution Control, General Safety and Health Manager), General Manager of Environment, Industrial Safety & Health Dept., General Manager of Corporate Communications, General Manager of Corporate Strategy Office, General Manager of Human Resources Dept., General Manager of Group Compliance, General Manager of Finance & Accounting Dept., General Manager of Legal Dept., General Manager of General Affairs Dept., General Manager of Construction & Maintenance Dept., General Manager of Global Engineering Center, and others designated by the Committee Chair

② Environmental Expert Committee

In principle, this committee meets four times each year. Other meetings are held at the discretion of the expert committee chair.

Governing Structure

Expert Committee Chair	General Manager of Environment, Industrial Safety & Health Dept., General Manager of ESG Promotion Dept.
Vice Chair	General Manager of Construction & Maintenance Dept.
Members	General Manager of Business Planning Dept., Energy Infrastructure Business Group, General Manager of Business Planning Dept., Ceramic Products Business Group, General Manager of Safety, Quality & Environment Dept., Electronics Business Group, General Manager of Business Planning Dept., Process Technology Business Group, persons in charge of promoting environmental activities in each division, Group Manager of ESG Promotion Department, Group Manager of Environment, Industrial Safety & Health Dept., others designated by the Expert Committee Chair

③ Environmental Committees at Each NGK Site

In principle, committees of each NGK site (Nagoya Site [headquarters, Atsuta/Mizuho], Chita Site, Komaki Site, Ishikawa Plant) meet twice each year in each area. They thoroughly convey matters determined by the Environment, Industrial Safety & Health Committee, and communicate and discuss issues and topics in each area (five sites hold two meetings each for total of 10 per year).

④ Environmental Management In and Outside Japan

Business divisions of NGK, including those at Group companies in and outside Japan, have environmental management systems aimed at realizing NGK's Core Policy on the Environment. The NGK headquarters surveys environmental performance at Group companies and conducts audits to monitor their conformance to environmental laws. If problems are discovered, the causes and remedies are determined and disseminated throughout the Group. At Group companies in Japan involved in manufacturing, annual liaison meetings are held in order to convey environmental policy and to share information on matters such as companies' environmental management status and effective environmental initiatives.

Environmental Management System (ISO 14001, etc.) Initiatives

The NGK Group encourages the acquisition of ISO 14001 or third-party certifications (such as Eco Stage 2 or Eco Action 21 in Japan) meeting this standard to systematically and continuously develop its environmental conservation activities in line with NGK's Core Policy on the Environment.

Under this initiative, all Group companies (excluding new Group companies), including those outside Japan, as well as the Nagoya, Chita, Komaki, and Ishikawa sites, have received certification. Two of these are bases that were newly certified in fiscal 2020.

Certification of Environmental Management System As of June 2021

Category		Number of manufacturing bases	Number of bases certified
NGK		4	4
Domestic Group	Energy Infrastructure Business Group	5	5
	Ceramic Products Business Group	1	1
	Electronics Business Group	8	8
	Process Technology Business Group	4	4
Overseas Group	Energy Infrastructure Business Group	3	3
	Ceramic Products Business Group	10	10
	Electronics Business Group	4	4
	Process Technology Business Group	4	4

New production bases operating less than two years not covered.

External Organizations' Evaluation of NGK Environmental Management

On the right is an evaluation by external organizations of NGK's recent environmental management and ESG activities.

Our fiscal 2020 rank was B for CDP-Climate Change and CDP-Water Security lists. Since fiscal 2016, we have been selected every year for the Dow Jones Sustainability Asia Pacific Index. In the Nikkei Environmental Management Survey, NGK's highest placing was 50th, in fiscal 2017. In the fiscal 2019 Nikkei SDGs Management Survey, we received a fiscal 2020 deviation value of 59.6.

ESG Company Evaluation

Evaluation index	Survey year				
	2016	2017	2018	2019	2020
CDP-Climate Change	B	B	B	A-	B
CDP-Water Security	B	B	B-	B-	B
DJSI/Asia Pacific	Selected	Selected	Selected	Selected	Selected
Nikkei Environmental Management Survey	109th	50th	62nd		
Nikkei SDGs Management Survey				Deviation value: 59.6	Deviation value: 59.1

Environmental Audits

NGK conducts internal audits and external audits (renewal audits) of the environmental management system at the Nagoya, Chita, and Komaki sites, as well as the Ishikawa Plant. Group companies also conduct these same internal audits, and external reviews of the environmental management systems are conducted by external auditors at all Group companies.

In fiscal 2020, in the same way as with the previous year, there were no significant findings. In the event of a significant finding, the relevant division and Environmental Management Dept. work together to review and implement countermeasures, as well as inform the Environment, Industrial Safety & Health Committee in each area in an attempt to horizontally deploy these measures.

Five-Year Environmental Action Plan

The NGK Group organizes environmental initiatives by creating five-year action plans. To achieve the goals of the five-year targets, we are promoting environmental activities and setting annual targets.

Outline of the Fifth Five-Year Environmental Action Plan (Fiscal 2021–2025)

We have established the Fifth Five-Year Environmental Action Plan, which encompasses our environmental action targets for fiscal 2021 through 2025.

This is the first five-year plan aimed at realizing the NGK Group Environmental Vision (announced in April 2021), which aims for net zero CO₂ emissions by 2050. The Environmental Vision's key themes are "carbon neutrality," "a recycling-oriented society," and "harmony with nature".

Base Year, Target Year, Control Scope

- Base Year: Fiscal 2013 (for some, Fiscal 2019)
- Target Year: Fiscal 2025
- Control Scope: Consolidated



Targets of the Fifth Five-Year Environmental Action Plan

The targets for each theme shown below have been established for fiscal 2025 which is the final year of the Fifth Five-Year Environmental Action Plan, and targets for the first year, fiscal 2021.































The plan pursues environmental action centered on the three themes of “carbon neutrality,” “a recycling-oriented society,” and “harmony with nature”, all of which is aimed at realization of the NGK Group environmental vision.

With regard to initiatives toward carbon neutrality, the conventional KPI used for CO₂ has been basic unit per net sales; however, we have changed this to CO₂ emissions volume in order to link it to our NGK Group environmental vision target. The intent of this change is to make it easier to gauge our progress towards our goal of net zero emissions by 2050, as well as our milestone target of a 50% reduction (370,000* metric tons) in CO₂ emissions volume by 2030 compared with the base year of fiscal 2013. Also, in order to facilitate action aimed at expanding the use of renewable energy, we have established a target for renewable energy use rate of total energy usage throughout the Group. Achieving this target will not only bring the NGK Group closer to achieving net zero carbon emissions but also help promote more widespread adoption of renewable energy in society.

Further, along with climate change, we also recognize that water resources represent an area of significant environmental concern, and it has been our ongoing practice to evaluate water resource risks and take appropriate action in response. Under the current plan, we have established quantitative indicators that will help us take more substantive action in addressing these risks.

On the other hand, we are focused on social connection through contributions to environmental society and promotion of environmental communication. In terms of contributions to environmental society, we have traditionally used the growth rate in sales of products contributing to environmental protection as a target; however, in order to bring this more in line with the NGK Group environmental vision, we have set a target to increase the number of carbon-neutrality-related products registered. With regard to CSR procurement, we are seeking to understand the environmental impact, including CO₂ emissions, exerted by our suppliers.

* Emissions are a revision of the calculation standard. Specifically, the power emission factor (coefficient for converting power consumption into CO₂) will be changed from the conventional fixed value to the actual value of the power company every year. This will reflect the renewable energy utilization rate.


Category	Item	KPI	FY2025 Target	FY2021 Target	Related SDGs
 Initiatives toward carbon neutrality	Reduce CO ₂ emitted by manufacturing activities	CO ₂ emissions (consolidated)	550,000 metric tons (Reduce by 25% from FY2013)	700,000 metric tons (Reduce by 4% from FY2013)	 
		Renewable energy use rate (consolidated)*	50%	25%	
	Reduce CO ₂ emitted across value chain	Plan progress (%)	• Expand Scope 3 calculation range • Life-cycle assessment (LCA) of major products	Initiate life-cycle assessment (LCA) of major products	
 Initiatives toward a recycling-oriented society	Reduce discarded materials emitted from manufacturing	Basic unit per net sales of discarded materials emitted	Reduce by 50% from FY2013	Reduce by 44% from FY2013	    
		Reduction rate against BAU for discarded materials emitted	Reduce by 30% from FY2013	Reduce by 25% from FY2013	
	Promote resource recycling	Recycling rate (Japan)	Maintain at least 99%	At least 99%	
	Manage and respond to water resource risks	Basic unit per net sales of water consumption (consolidated)	Maintain FY2019 levels	FY2019 levels	
 Initiatives toward harmony with nature	Promote biodiversity conservation	Plan progress (%)	Expand and enhance actions aimed at Post-2020 Global Biodiversity Framework targets	Research on Japan and overseas trends	 
 Contributions to environmental society	Develop and distribute products/services contributing to environmental protection	Number of registered products	Increase number of carbon neutrality-related products registered	Increase in number of registered products	            
	Promote CSR procurement	Plan progress (%)	Evaluate environmental data from suppliers	Reviewing the details of the survey of suppliers	
 Promotion of environmental communication	Contribute to local communities	Plan progress (%)	Continually enhance actions partnering with local communities	Collaboration with Aichi Sustina Research Institute and EPOC	  
	Raise environmental awareness	Plan progress (%)	Continually enhance environmental training and information disclosure	Publicize the NGK Group Environmental Vision	

* Ratio of electricity from renewable energy to total electricity consumption

Results of the Fourth Five-Year Environmental Action Plan

Below are the results of the fourth Five-Year Environmental Action Plan, which ended in fiscal 2020.

In the first fiscal half, demand dropped for core products due to the impact of the COVID-19 pandemic, and unfortunately we did not meet targets for products that contribute to environmental protection and for CO₂ emission reductions versus BAU (business as usual). However, thanks to efforts at production bases and the startup of new factories and new production lines, production efficiency improved, and we met our target for CO₂ emission intensity of sales, something we had not been sure of achieving.

Category	Item	KPI	FY2020			Take action in 11 of the 17 SDGs	
			Target	Result	Self-evaluation*1		
Environmental/social contribution	 Environmental/ social contribution through products	Develop and distribute products contributing to environmental protection	Sales growth (%) (consolidated)	Increase by at least 60% from FY2013	Increased by 44% from FY2013	×	       
		Promote green procurement	Plan progress (%)	Maintain in Japan, expand overseas	<ul style="list-style-type: none">99.9% agreed (100% including suppliers who partially agreed)Unable to get useful information on overseas activities	○	
	 Promotion of environmental communication	Contribute to local communities	Plan progress (%)	Continually enhance actions partnering with communities	Group companies participated	○	 
		Raise environmental awareness	Plan progress (%)	Continually enhance environmental training and information disclosure	<ul style="list-style-type: none">Provided training programs by job gradeInstalled “green curtains”	○	
	 Conservation of biodiversity	Promote actions based on biodiversity conservation guidelines	Plan progress (%)	Expand and enhance content of Aichi Targets actions	While expanding the content of initiatives as planned, a cumulative total of approximately 6,800 employees in the NGK Group have participated in the My Action Declaration.	○	 
Environmental impact reduction	 Prevention of global warming	Reduce CO ₂ emitted from manufacturing	Basic unit per net sales (consolidated)	Reduce by 20% from FY2013	Reduced by 20% from FY2013	○	   
			Reduction rate against BAU (%)*2 (consolidated)	Reduce by 18% from FY2013 (upward revision from initial 15% target)	Reduced by 13% from FY2013	×	
		Reduce CO ₂ emitted from supply chains	Basic unit per transport volume*3 (non-consolidated)	Reduce by 1% per year on 5-year average*4	Increased by 1.6% per year on 5-year average*4	×	
	 Effective use of resources	Reduce discarded materials emitted from manufacturing	Basic unit per net sales (consolidated)	Reduce by 30% from FY2013	Reduced by 45% from FY2013	○	    
			Reduction rate against BAU (%)*2 (consolidated)	Reduce by 23% from FY2013 (upward revision from initial 20% target)	Reduced by 24% from FY2013	○	
		Promote resource recycling	Recycling rate (Japan)	Maintain at least 99%	99.7%	○	
		Manage and respond to water resource risks	Plan progress (%)	Strengthen actions by production bases for evaluating risks and streamlining water use	Water consumption continued at stable pace	○	

Notes:

*1: Self-evaluation standards for achievement level: ○: Target achieved; ×: Target not achieved

*2: Reduction rate against BAU (business as usual) indicates the percentage rate of emissions reduction resulting from implemented actions compared to a case in which no improvement action was taken since fiscal 2013. By not incorporating the influence of foreign exchange movements and other factors, this indicator allows a direct grasp of the efforts by each site.

*3: NGK basic unit per transport volume expresses in metric ton-kilometers the amount of crude oil equivalent fuel used.

*4: Based on the computation criteria stipulated in the Act on the Rational Use of Energy.

Environmental Risk Management

At the NGK Group, each manufacturing site has individually established environmental management systems to prevent environmental pollution.

Every year, business group staff members who oversee Group companies join together with staff members from the Environmental Management Department at NGK headquarters to conduct environmental audits of Group company manufacturing sites and help improve the level of environmental management of the NGK Group as a whole. In fiscal 2020, on-site audits were carried out as usual for the manufacturing sites of Group companies in Japan, while, due to travel restrictions in place to prevent the spread of COVID-19, remote audits were conducted for select sites of Group companies outside Japan.

Regulatory Compliance

NGK conducts monitoring and assessments as well as vigorous control of exhaust and wastewater produced from its sites, observing relevant regulations and environmental preservation-related and other agreements with control authorities. Additionally, we organize environmental management specialist seminars on a regular basis for all Group companies in Japan to keep responsible persons updated on related topics, thereby enhancing our capabilities to prevent environmental pollution.

In fiscal 2020, there were no major violations of environment-related laws by NGK.

Environmental Patrols and Emergency Response Drills

NGK implements environmental patrols in line with annual plans to prevent environmental pollution and conducts response drills based on emergency scenarios to minimize damage.

In fiscal 2020, environmental patrols were conducted at the Nagoya, Chita, and Komaki sites and the Ishikawa Plant to prevent atmosphere and water pollution, ensure the appropriate management of chemical substances, and suppress noise and vibrations. Response drills based on emergency scenarios were also conducted at these four areas. Going forward, NGK will continue to proactively engage in patrols and drills in an attempt to improve operational methods and mitigate environmental risks.

Activities Conducted in FY2020

		Atmosphere	Water	Noise and vibrations	Chemical substances
Nagoya	Environmental patrols	4	4	4	2
	Emergency response drills	5	2	—	2
Chita	Environmental patrols	1	3	1	1
	Emergency response drills	5	5	—	—
Komaki	Environmental patrols	1	2	2	1
	Emergency response drills	7	11	—	—
Ishikawa	Environmental patrols	2	2	2	2
	Emergency response drills	5	3	—	4





Note: “—” indicates emergency response drills were considered of low importance and not conducted.

Chemical Management System

NGK abides by laws, guidelines, and other rules on chemical substances by maintaining a proper level of management for the procurement, usage, and disposal of chemicals, and by constantly striving to improve this level. Before new chemicals are used, each department that will procure and use them works with an NGK panel of chemical substances safety for confirmation and guidance regarding the necessity of using these chemicals and what precautions must be taken in stages such as their usage and disposal. For chemicals already being used at NGK, each site's chemical substances committee and chemical substances patrol team determine and confirm the state of chemical management and provide the necessary guidance. We also follow and post information regarding changes in chemical substance-related regulations in order to ensure proper chemical management is implemented.

At Group companies inside and outside Japan, ISO 14001 management systems are used to survey and understand regional rules and regulations so that chemical substances can be properly managed.

Chemical Management Flowchart

Department	Department using chemicals	Division checking (safety and health, environment, construction and maintenance)	Purchasing Department	Department using chemicals
Details	Confirm SDS (safety data sheet) of intended substance, apply for permission to use	Review of new chemical substances Guidance (on use, storage, disposal, etc.) to department using chemicals	Register purchasing information	Appropriate control at departments (Implementation of guidance items, inventory control)
Tools and methods	 Application process	 Chemical Substances Safety Committee Substances contained, relevant regulations, abatement equipment, disposal method, etc.	 Purchasing system Registration of substances, regulations, and storage facilities	 Chemical substances inventory control system

Strengthening of Global Environmental Management

In accordance with the Guidelines for Environmental Action, the NGK Group horizontally deploys domestic environmental impact reduction initiatives in Group companies outside Japan while creating mechanisms to strictly comply with amendments to environmental laws and regulations to propel our global environmental management to the next level.

Mitigating Environmental Risks throughout the Group

All NGK Group manufacturing bases in and outside Japan have completed acquisition of ISO 14001 or third-party certifications meeting this standard and implement environmental management in line with environmental management systems.

NGK shares information regarding changes in domestic environmental laws and regulations with Group companies and has created a structure to ascertain the status of responses to these changes. Overseas, NGK headquarters is enhancing its ability to regularly ascertain the status of responses and management in terms of important legal and regulatory system revision information in the countries and regions where Group companies are located.

In fiscal 2020, continuing from fiscal 2019, staff of the NGK headquarters continued their work in conducting audits at 7 manufacturing bases in Japan and 11 overseas, with a focus on environmental risk. Based on audit results, problems were remedied and support was provided for improvements as part of continuing efforts to mitigate environmental risks throughout the Group. Periodic audits will continue to be conducted at all bases in fiscal 2021 and beyond.

Strengthening Environmental Management Linked to Business Planning

The NGK Group aims to build an environmental management system that can cope with changes in both our business plan and the state of the social environment.

Initiatives aimed at reducing environmental impact in accordance with business plans include conducting biannual forecast estimates and achievement evaluations in each business group, product line, and manufacturing base to determine which initiatives to pursue next.

These efforts include the establishment of the Environmental Expert Committee under the Environment, Industrial Safety & Health Committee as a company-wide decision-making body. The Environmental Expert Committee facilitates discussions among managers from planning and production divisions who formulate and promote actual business planning in each business division, strengthening the company-wide environmental management system. Going forward, we will continue to strengthen management integration with the aim of promoting environmental management that combines global environmental protection and corporate growth.

Commitment to Reducing Hazardous Substances

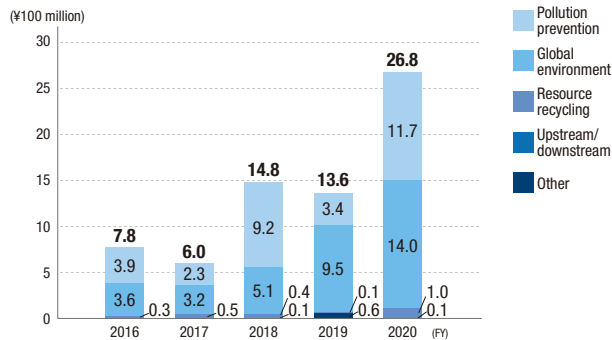
The NGK Group aims to reduce the amount of hazardous substances used. In our Guidelines for Environmental Action, we state that we “Reduce risks through the appropriate usage and management of chemical substances.”

Regarding the raw materials we handle, documents such as our CSR Procurement Guidelines and Green Procurement Standard require that our suppliers follow rules for specific hazardous substances.

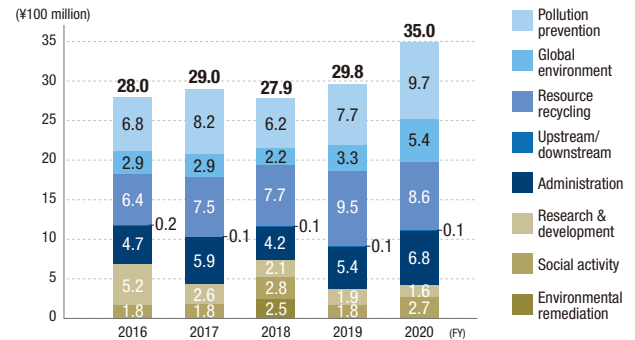
Environmental Accounting

As an important index of environmental management, NGK conducts environmental accounting and announces the results. In addition to announcing environmental conservation costs (capital investment, expenses), economic benefits, and cost effectiveness, information on the environmental efficiency of CO₂ and discarded materials has been added since fiscal 2007.

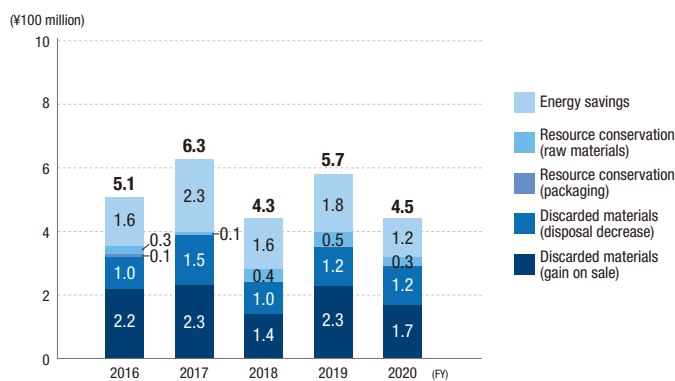
Capital Investment (NGK and Group companies in Japan)



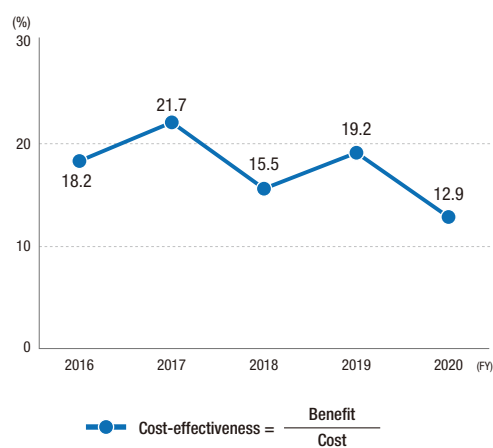
Expenditures (NGK and Group companies in Japan)



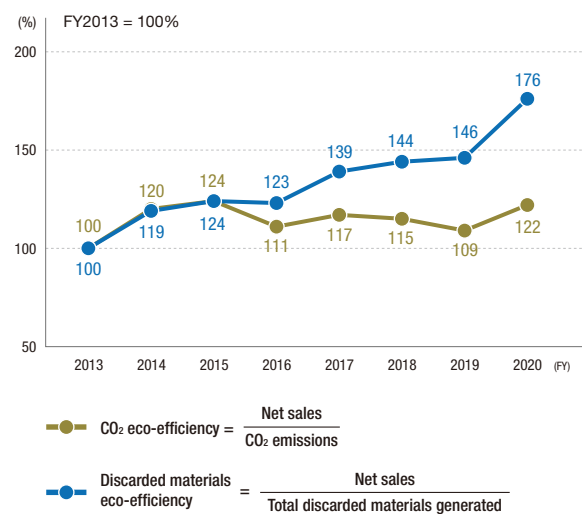
Economic Benefits (NGK and Group companies in Japan)



Cost-Effectiveness (NGK and Group companies in Japan)



Environmental Efficiency (consolidated)



Note: The above charts do not include data for NGK Electronics Devices, Inc. and other manufacturing subsidiaries for fiscal 2015.

Environmental Performance

The table below shows aggregate inputs to and outputs from manufacturing operations of the entire NGK Group at all domestic and overseas sites. Inputs represent data for raw materials and energy etc. and outputs for manufactured products and services as well as substances that are discharged into the atmosphere and into water.

FY2020 NGK Group Material Balance (Input and Output)

Category	Item	Unit	FY2018		FY2019		FY2020	
			Consolidated	Non-consolidated	Consolidated	Non-consolidated	Consolidated	Non-consolidated
INPUT	Electric power	TWh	0.93	0.25	0.95	0.25	0.88	0.22
	Gas (natural gas conversion)	Million Nm ³	142	20	137	19	116	17
	Oil (light oil conversion)	Million L	2.11	0.28	1.74	0.30	1.65	0.31
	Raw materials	10 ³ metric tons	180	30	150	30	140	30
	Recycled materials	10 ³ metric tons	0	0	0	0	0	0
	PRTR-listed substances	Metric tons	694	219	589	236	506	188
	Total water usage	Million m ³	4.53	1.60	4.33	1.55	3.78	1.45
OUTPUT	Energy-origin CO ₂	10 ⁶ metric tons of CO ₂	0.87	0.16	0.87	0.16	0.76	0.13
	Other greenhouse gases	10 ³ metric tons of CO ₂	1	0	1	0	0	0
	CO ₂ (non-energy origin)	10 ³ metric tons of CO ₂	0	0	0	0	0	0
	CH ₄	10 ³ metric tons of CO ₂	0	0	0	0	0	0
	N ₂ O	10 ³ metric tons of CO ₂	0	0	0	0	0	0
	HFC	10 ³ metric tons of CO ₂	0	0	0	0	0	0
	PFC	10 ³ metric tons of CO ₂	0	0	0	0	0	0
	SF ₆	10 ³ metric tons of CO ₂	0	0	0	0	0	0
	VOC	Metric tons	120	0	68	0	83	0
	PRTR-listed substances (emissions into atmosphere)	Metric tons	128	3	76	3	89	3
	Discarded materials	10 ³ metric tons	60	10	50	10	50	10
	Recycled	10 ³ metric tons	40	10	40	10	30	10
	Disposed of externally	10 ³ metric tons	20	0	10	0	10	0
	Total water discharge	Million m ³	2.81	1.37	3.14	1.40	2.53	1.09
	PRTR-listed substances (discharge into bodies of water)	Metric tons	0	0	1	1	0	0
	Scope 1 (energy-origin CO ₂)	10 ⁶ metric tons of CO ₂	0.32	0.04	0.31	0.04	0.26	0.04
	Scope 2 (energy-origin CO ₂)	10 ⁶ metric tons of CO ₂	0.55	0.12	0.56	0.11	0.49	0.10

Notes:

1. Environmental performance values in this data book have been rounded off for convenience; therefore the sum of individual values may not match the totals.
2. "Discarded materials" indicates the total amount of industrial waste and valuables.
3. Figures in the non-consolidated column indicate data from non-consolidated NGK production bases (Headquarters, Nagoya Site, Chita Site, Komaki Site, Ishikawa Plant).
4. For the consolidated values of OUTPUT/energy-origin CO₂ and Scope 2 (energy-origin CO₂), as with the non-consolidated values, the calculation standard has been changed from the previous fixed value for the emission coefficient of electricity (a factor for converting electricity consumption into CO₂) to annually updated values of each electric power supplier.

Water Consumption and Recycling Rate

Water Withdrawal by Source, Water Discharge by Destination, Recycled Amount, Recycling Rate

Item		Unit	FY2018		FY2019		FY2020	
			Consolidated	Non-consolidated	Consolidated	Non-consolidated	Consolidated	Non-consolidated
Water withdrawal	Municipal government water utility (or other water utility)	Million m ³	3.91	1.14	3.71	1.08	3.13	0.949
	Groundwater	Million m ³	0.62	0.47	0.62	0.47	0.64	0.497
	Surface water (lakes, rivers, etc.)	Million m ³	0.002	0.0	0.001	0.0	0.002	0.0
	Total	Million m ³	4.532	1.610	4.331	1.550	3.777	1.445
Water discharge	Sewerage	Million m ³	0.71	0.19	0.66	0.20	0.60	1.65
	Rivers, lakes, etc.	Million m ³	2.10	1.18	2.48	1.20	1.935	0.92
	Waste	Million m ³	0.0	0.0	0.0	0.0	0.0	0.0
	Ground permeation	Million m ³	0.0	0.0	0.0	0.0	0.0	0.0
	Total	Million m ³	2.81	1.37	3.14	1.40	2.534	1.092
Recycled amount		Million m ³	0.09	0.0	0.09	0.0	0.066	0.0
Recycling rate		%	2.0	0.0	2.0	0.0	1.7	0.0

INPUT

1. Energy

Electric power:

Consumption amount of electric power

Gas: Consumption volume of each type of fuel gas converted into natural gas volume = Σ (Consumption volume of each fuel gas \times Unit heating value of each fuel gas / Unit heating value of natural gas)

<Unit heating value of fuel gas>

Natural gas: 43.5 MJ/Nm³ City gas: 45.0 MJ/Nm³

LPG: 50.8 MJ/kg LNG: 54.6 MJ/kg

Oil: Consumption volume of each type of fuel converted into light oil volume = Σ (Consumption volume of each fuel \times Unit heating value of each fuel / Unit heating volume of light oil)

<Unit heating value of fuel>

Light oil: 37.7 MJ/L Fuel oil A: 39.1 MJ/L Kerosene: 36.7 MJ/L Gasoline: 34.6 MJ/L

2. Water

Total consumption volume of city water, industrial water, well water, and rainwater

3. PRTR-listed substances

Total amount handled of Japan's PRTR Type 1 listed substances

4. Raw materials

Total weight of raw materials used in product manufacturing

OUTPUT

5. Energy-origin CO₂ emission volume

Energy-origin CO₂ emission volume = Σ (Consumption of each energy \times CO₂ conversion factor of each energy)

<CO₂ conversion factor of energy>

(Unit of electric power factor: kgCO₂/kWh Unit of fuel factor: kgCO₂ / fuel unit)

Electric power

Japan: Emission coefficient for each electric utility adjusted in Japan based on the Act on Promotion of Global Warming Countermeasures; United States: Green-e values; Belgium, France, Poland: AIB values; Australia: Australian National Greenhouse Accounts values; other countries: IEA values

Fuel Natural gas (Nm³): 2.22; City gas (NGK on a non-consolidated basis) (Nm³): 2.244;
City gas (except NGK on a non-consolidated basis) (Nm³): 2.23; LPG (kg): 3.00; LNG (kg): 2.70; Light oil (L): 2.58;
Fuel oil A (L): 2.71; Kerosene (L): 2.49; Gasoline (L): 2.32; Industrial steam (MJ): 0.06

6. Emission volume of other greenhouse gases

Emission volume of other greenhouse gases = Active mass \times Emission factor \times Global warming potential

<Global warming potential>

CO₂: 1; CH₄: 25; N₂O: 298; HFC: Differs by type; PFC: Differs by type; SF₆: 22800; NF₃: 17200

7. Water discharge

Total amount of discharged water excluding rainwater

8. PRTR-listed substances

Discharge into bodies of water: Total amount of Class 1 substances listed under Japan's PRTR Act discharged into public bodies of water

Emissions into the atmosphere: Total amount of Class 1 substances listed under Japan's PRTR Act emitted into the atmosphere

9. Total amount of discarded materials generated

Total amount of discarded materials generated = Externally disposed amount*1 + Externally recycled amount

Recycled amount: Externally recycled amount = Paid disposal*2 + Valuable amount (selling off)

*1 Externally disposed amount: Direct disposal by landfill, or simple incineration

*2 Paid disposal: Outsourcing disposal and paying for recycling

10. Scope 1 to 3

Scope 1: Direct emissions of greenhouse gases by the reporting company (generated from the burning of fuel or industrial processes)

Scope 2: Indirect emissions of greenhouse gases by the reporting company resulting from the use of electricity, steam, or heat purchased from other companies

Scope 3: All other indirect emissions of greenhouse gases (not included in Scope 1 or 2) that occur in the reporting company's value chain

Climate Strategy / Initiatives Toward Carbon Neutrality

Climate Change Strategy

The NGK Group strives to reduce CO₂ emissions, a major cause of global warming, by setting and working toward achievement of emission reduction targets.

NGK is a member of the Japan Climate Leaders' Partnership (Japan-CLP), a business coalition in Japan that aims to create a low-carbon society through decarbonization of business, trial business collaborations, policy creation and publicity activities, and cooperation with like-minded international organizations.

NGK Endorses TCFD*

The NGK Group is committed to making even greater efforts amidst government and private sector actions to achieve the goals of the Paris Agreement. The Group's top management determined the importance of endorsing the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), which encourages the disclosure of climate-change related risks and opportunities towards making plans for reducing CO₂ emissions. In February 2020 the Group announced its endorsement of the recommendations of the TCFD.



The TCFD Task Force (TCFD-TF) was established in fiscal 2021, comprised primarily of members drawn from headquarters, and has begun looking into TCFD-based information disclosure.

* TCFD: The Task Force on Climate-Related Financial Disclosures was established by the Financial Stability Board (FSB). The G20 Osaka Summit in June 2019 provided the impetus for many Japanese companies to announce their endorsement of the TCFD recommendations. (As of July 26, 2021, 451 companies and organizations have announced endorsement.)

Management of Climate Change Risks

Action plans proposed by the ESG Committee are deliberated on by the Board of Directors before being carried out under group environmental management. In fiscal 2019, the ESG Committee, made up of management and chaired by the President, was launched to discuss important tasks and strategies and create action plans related to ESG. The ESG Committee discusses the management of climate change risks. With regard to climate change issue-focused aims and strategy, these were decided through discussion among the members of the ESG Committee and Board of Directors and then presented within the NGK Group Environmental Vision released in April 2021. For CO₂ emissions reduction, the aim is to reduce emissions to 50% of their fiscal 2013 level by 2030, with the ultimate goal of achieving net zero emissions by 2050. Moving forward, we will provide information as recommended by the TCFD.

New Carbon Offset Initiatives

We anticipate that our current energy-saving activities will not be enough on their own for the NGK Group to achieve the stated aim of the Environmental Vision to realize net zero CO₂ emissions by 2050. Thus, in order to overcome this gap, we will pursue a variety of strategies, both in Japan and overseas, which will involve carbon offset initiatives on an unprecedented scale for the NGK Group.

Already in fiscal 2021 the following have been carried out.

- ◆ In Japan, three NGK sites (Nagoya, Chita, Komaki) and one Group company (NGK Ceramic Device headquarters) have switched to completely carbon neutral city gas (represents a CO₂ reduction of approximately 30,000 metric tons/year)
- ◆ A manufacturing site in Belgium (NGK Ceramics Europe) has switched to using 100% renewable energy coming from offshore wind power generation (represents a CO₂ reduction of approximately 3,000 metric tons/year)
- ◆ A manufacturing site in Poland (NGK Ceramics Polska) is using renewable energy certificates to offset some of its energy consumption (represents a CO₂ reduction of approximately 200,000 metric tons/year)

Climate Change Targets

Emissions reduction targets for CO₂, which is a major contributor to global warming, are included in the Five-Year Environmental Action Plan adopted by the NGK Group (See p. 24).

Preventing Global Warming

Reducing CO₂ Emissions Associated with Manufacturing Activities

By creating and implementing annual improvement plans in line with the business plans of each of our manufacturing sites both within Japan and overseas, the NGK Group has been making steady progress toward achieving the CO₂ emissions reduction targets set under our Five-Year Action Plan.

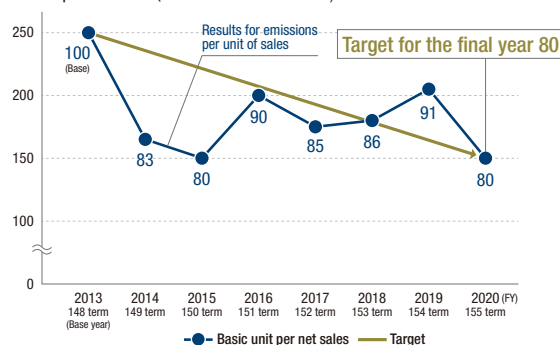
Fiscal 2020, which was the last year of the NGK Group's fourth Five-Year Environmental Action Plan, saw a drop in production volume as a result of lower demand for core products due to the impact of the COVID-19 pandemic. However, with demand recovering in the latter half of the year, manufacturing site production capacity also picked back up, while work on getting new facilities on-line also moved forward. As a result, in terms of reduction per unit of sales, there was significant improvement over fiscal 2019, and we were able to achieve the Five-Year Environmental Action Plan target of 20% emissions reduction compared with fiscal 2013, which is base year. On the other hand, however, the BAU rate of reduction, which reflects improvement in emissions per unit of production, was significantly impacted by the fact that there was a drop in material volume, which exceeded the per-unit-improvement for production, thus resulting in the target not being met.

In order to help ensure we meet the NGK Group Environmental Vision goal of realizing net zero CO₂ emissions by 2050, we began in fiscal 2021 to replace management indicator basic units with CO₂ emissions volumes. We will also establish renewable energy usage rate targets for electrical power. Moving forward, we will keep working Group-wide to reduce our CO₂ emissions.

CO₂ Emissions per Basic Unit of Net Sales*

(All NGK Group manufacturing sites)

Basic unit per net sales (Metric tons/¥100 million)

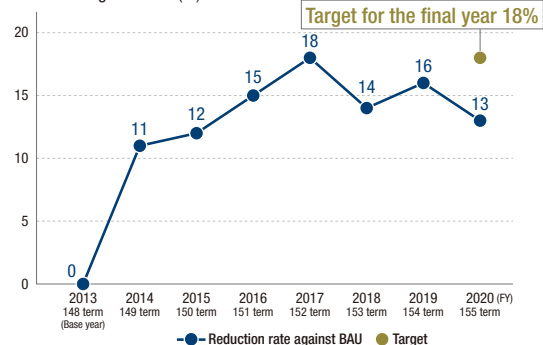


*Soshin Electric, which was spun off from the NGK Group in fiscal 2020, are omitted for the whole period.

Reduction Rate against BAU*

(All NGK Group manufacturing sites)

Reduction rate against BAU (%)

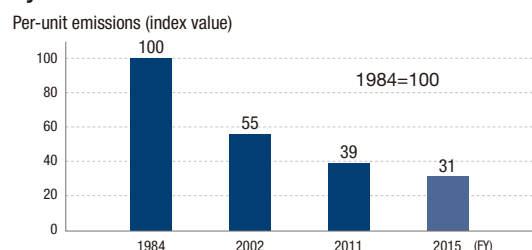


*Soshin Electric, which was spun off from the NGK Group in fiscal 2020, are omitted for the whole period.

Adoption of Environmentally Friendly Production Processes

Through the introduction of highly efficient equipment and the promotion of the collection and use of exhaust heat and improved production efficiency, the NGK Group makes efforts to reduce environmental impacts resulting from production. Also, we will create even more advanced eco-processes, which are aimed at enhancing competitiveness.

Change in CO₂ Emissions from Continuous Kilns by Year of Introduction



Note: Change in CO₂ emissions from continuous kilns, which constitute major production equipment

Measures to Reduce CO₂ Emissions and Effects

As we continue to expand overseas manufacturing, the NGK Group is particularly striving to raise manufacturing efficiency at our overseas sites in order to reduce the CO₂ emissions of the Group as a whole. We have made steady progress by introducing the innovative manufacturing processes and improvements to facilities and operations that we have implemented to date in Japan in our overseas manufacturing sites, as well as promoting energy-saving activities for general-purpose equipment.

Examples of Initiatives Aimed at Reducing CO₂ Emissions

Category	Measures	Effects (FY2020)
Highly efficient manufacturing processes	Main production efficiency initiatives at overseas sites <ul style="list-style-type: none"> • Introduction of innovative production processes • Facility improvements • Operational improvements 	CO ₂ reduction effect (9,000 metric tons) Japan: 4,000 metric tons Overseas: 5,000 metric tons
Group company energy-saving diagnostics	Promoted energy savings at overseas sites <ul style="list-style-type: none"> • An English version of the voluntary energy-saving guidelines and a best practice brochure created and distributed to overseas sites • Headquarters staff visited overseas sites and conducted activities with local employees 	Of which <ul style="list-style-type: none"> • Production process improvements Japan: 2,000 metric tons Overseas: 3,000 metric tons
General-purpose equipment energy-saving activities	Horizontally deployed main improvements <ul style="list-style-type: none"> • Replaced boilers with more efficient models • Eradicated air and steam leaks from plumbing • LED lighting • Renewed air-conditioning equipment and eliminated wasteful air conditioning 	<ul style="list-style-type: none"> • General-purpose equipment energy savings Japan: 3,000 metric tons Overseas: 2,000 metric tons

Energy-Saving Activities for General-Purpose Equipment and Buildings

The NGK Group has been actively promoting energy-saving activities in relation to general-purpose equipment, such as lighting, air conditioners, boilers, and compressors. The headquarters plays a central role in this in terms of sharing know-how among different manufacturing locations, thereby achieving more efficient activities.

Whenever our buildings are built or altered, we ensure that large-scale energy-saving measures and ZEB (P35 zero energy building) principles are incorporated.

(1) Headquarters Supporting Energy-Saving Activities at Overseas Manufacturing Sites

The headquarters Engineering Department has, over the years, sent personnel to overseas manufacturing sites to perform energy audits and, as necessary, help local staff develop and carry out effective energy-saving measures using the know-how gained from practices in Japan. These efforts have produced solid results at overseas companies, including NGK Ceramics Polska. (See “Global Warming Countermeasures Taken by Group Companies.”)

(2) Creating and Distributing a Printed Version of the Energy-Saving Brochure and Guidelines

We have created a printed version (Japanese, English) of our energy-saving guidelines and brochure of best practices, both of which were previously available only in digital formats. Copies have been distributed to each manufacturing site in and outside of Japan to be kept handy at worksites for easy reference. This is expected to help enhance activities to reduce CO₂ emissions.



(3) Efforts to Conserve Energy within Buildings

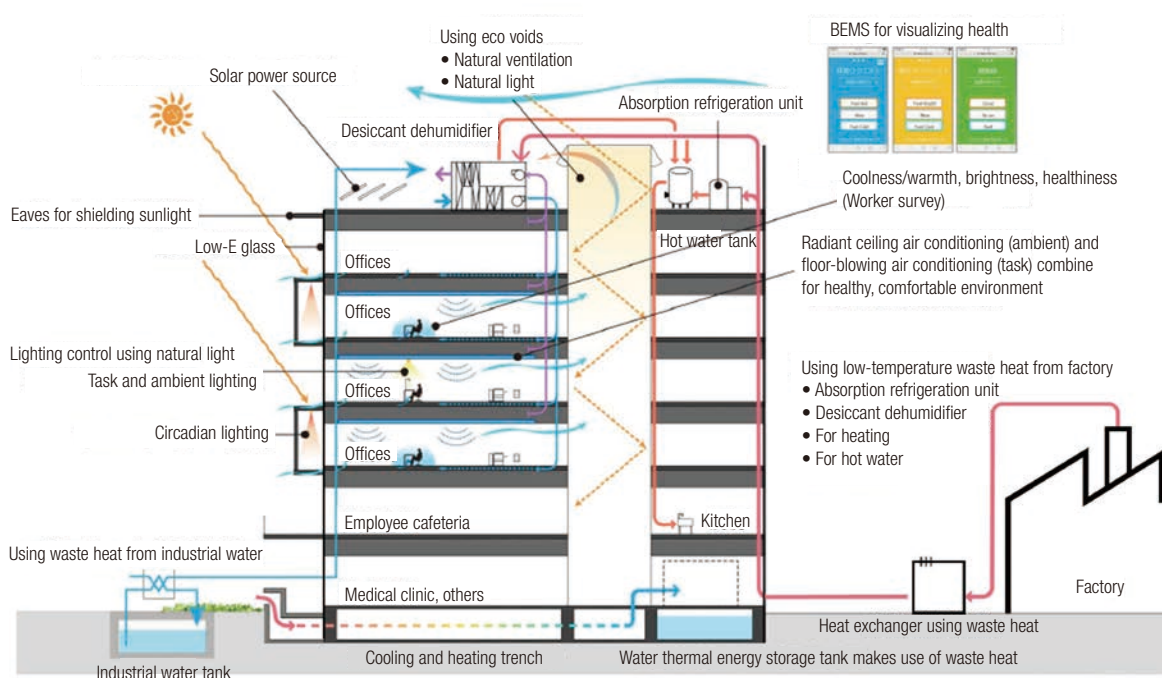
Whenever there is the opportunity to build or renovate a building, we actively endeavor to utilize high-efficiency equipment and introduce renewable energy, and carefully consider each location so as to be able to effectively utilize any natural advantages, such as low-temperature waste heat from our adjacent factories and natural ventilation/lighting, to achieve significant energy savings.

Efforts like these allowed the new administration/welfare wing, which was completed in Mizuho, Nagoya in January 2020, to be a zero energy building (ZEB)-oriented office facility whose CO₂ emissions are less than half of the official standard. This construction project has been lauded for its pioneering CO₂ reduction technology, and it was adopted as a Leading Sustainable Building Project (CO₂ Reduction) by Japan's Ministry of Land, Infrastructure, Transport and Tourism.

We have many more construction/renovation projects lined up as part of our plans to reorganize corporate structure and update old buildings, all of which will include energy saving and ZEB measures.



New administration/welfare wing



Global Warming Countermeasures Taken by Group Companies

NGK Stanger Pty. Ltd. and Hokuriku Energys Corporation

NGK Stanger and Hokuriku Energys collect and recycle gas-filled switches that are being disposed of by clients. These units contain sulfur hexafluoride (SF₆) for insulation purposes, and as it has a very high global warming potential, the companies collect all SF₆ when disassembling the unit without allowing it to be released into the atmosphere. The total amount of SF₆ recovered in fiscal 2020 was 631 kg, which is the equivalent of approximately 14,400 metric tons of CO₂.



NGK Ceramics Polska Sp. z o.o.

Since 2011, NGK Ceramics Polska has been focusing on improving processes for manufacturing SiC-based DPFs, its main product. Target areas include particularly energy-intensive calcination and drying processes, for which we have carried out various measures to reduce our CO₂ emissions. To further improve our performance, we will introduce new measures, including technologies provided by the Nagoya Site.



NGK Metals Corporation

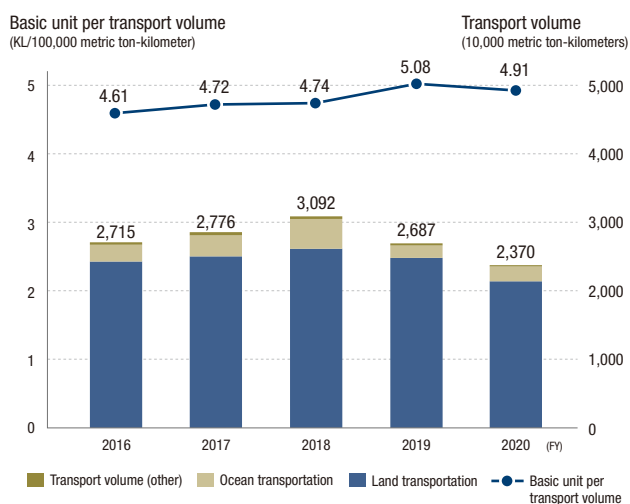
NGK Metals is reducing CO₂ emissions by updating control systems and improving the operation of production equipment. Among various efforts, a particularly distinctive effect resulted from automating the control units of the oil circulation system for rolling mills. The automation eliminated unnecessary around-the-clock operation, a measure taken to address inefficient activation/deactivation processes, as well as simplifying complex manual processing. This change helped reduce electric power consumption as well as CO₂ emissions.



Reduction of CO₂ in Logistics Processes

NGK has worked to reduce CO₂ emissions from logistics, setting a target of reducing the basic unit per transport volume by 1% year-on-year on a five-year average, as required by the Energy Conservation Act. To achieve this target, we have implemented a number of measures, including improving loading efficiency and promoting a modal shift. In recent years, the basic unit per transport volume has shown a tendency to deteriorate due to a decline in the volume of goods transported by sea on account of a change in the product mix. In fiscal 2020, the final year of the fourth Five-Year Environmental Action Plan, the five-year average deteriorated by 1.6% year-on-year.

Transport Volume / Basic Unit per Transport Volume



Introduction of Green Power

As part of our corporate activities aimed at harmony with the environment, NGK began introducing "green power" (energy sources such as wind and solar power and biomass fuels) in 2002. The Green Power Certification System contract we signed with Japan Natural Energy Company Limited calls for them to generate two million kilowatt hours of biomass-generated electricity for us each year.

This accounts for about 60% of the power consumed annually at the NGK headquarters building, attaining a reduction effect of approximately 1,000 metric tons of CO₂ emissions per year, or the annual amount of CO₂ absorbed by approximately 71,000 cedar trees.



Scope 3 GHG Emissions

Starting in fiscal 2017, NGK has been calculating Scope 3 emissions on a non-consolidated upstream basis in response to emerging expectations for businesses to expand the relevant data reporting scope to include supply chain CO₂ emissions levels. In fiscal 2020, NGK confirmed that the total volume of CO₂ emission from NGK logistics was 893,000 metric tons, which was over seven times more than the 133 thousand metric tons of NGK in-house CO₂ emissions (sum of Scope 1 and 2), and that Category 1 (purchased goods and services) amounted to over 80% of total CO₂ emissions. NGK will continue to develop calculation methods that can ascertain CO₂ emission levels in relation to a greater range of items.

Please note that the calculation used for Scope 3 data was carried out in accordance with Basic Guidelines Regarding the Calculation of Greenhouse Gas Emissions through the Supply Chain (Ver. 2.2) (Ministry of the Environment; Ministry of Economy, Trade and Industry).

The fifth Five-Year Environmental Action Plan, which starts from the current fiscal year, expands Scope 3 calculations to the entire Group and includes downstream categories.

Scope 3 GHG Emissions

Category	Item	Unit	FY2017	FY2018	FY2019	FY2020
			Non-consolidated	Non-consolidated	Non-consolidated	Non-consolidated
1	Purchased goods and services (including resale items)	10 ³ metric tons of CO ₂	762	863	842	770
2	Capital goods	10 ³ metric tons of CO ₂	84	152	99	90
3	Fuel- and energy-related activities	10 ³ metric tons of CO ₂	16	18	16	15
4	Upstream transportation and distribution	10 ³ metric tons of CO ₂	11	8	14	13
5	Waste generated in operations	10 ³ metric tons of CO ₂	1	3	2	2
6	Business travel	10 ³ metric tons of CO ₂	1	1	1	1
7	Employee commuting	10 ³ metric tons of CO ₂	2	2	2	2
8	Upstream leased assets	10 ³ metric tons of CO ₂	0	0	0	0
Total		10 ³ metric tons of CO ₂	877	1,047	977	893

Internal Carbon Pricing

Introducing Internal Carbon Pricing

Internal carbon pricing (ICP) refers to the establishment and use of in-house carbon pricing for the purpose of promoting decarbonization-focused investment and policies. By establishing our own per-volume price internally on GHG emissions, these emissions become capable of affecting our financial indicators. The TCFD also recommends the adoption of ICP as a tool for ascertaining risks and opportunities, as well as influencing behavior, accompanying the transition of companies to a low-carbon society.

NGK is considering the use of ICP as a means of incentivizing investment in high-efficiency equipment and facilities and renewable energy-related infrastructure that will help us realize our NGK Group Environmental Vision target of net zero CO₂ emissions by 2050.

Initiatives for a Recycling-Oriented Society

Promoting Effective Use of Resources

To boost yield from manufacturing process improvements, the NGK Group reuses in-process materials in an effort to curb discarded materials while also focusing efforts on recycling to reduce final disposal volumes to promote resource recycling.

Reducing Discarded Materials from Manufacturing Activities

In the same way as for CO₂, the NGK Group works to suppress the generation of waste (discarded materials) by formulating and managing annual improvement plans with the aim of achieving the waste reduction targets contained in the Five-Year Action Plan.

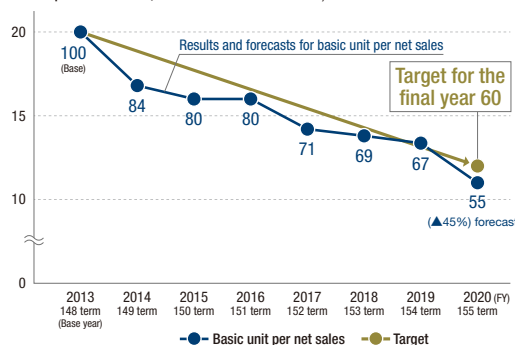
In fiscal 2020, as with CO₂, there were numerous factors that hampered waste reduction, such as lower demand for NGK's main products and a strong yen. However, the basic unit per net sales improved from the previous year to 45% compared to fiscal 2013 and reached the Five-Year Action Plan. This was thanks to the continuing improvement activities of our manufacturing divisions, such as improving the material utilization rate and production yield, and recycling within each process.

Meanwhile, the reduction rate against BAU, which indicates the rate of improvement in the basic unit per production volume from the fiscal 2013 level, was 24%, achieving the final five-year target of 23% of the Five-Year Action Plan.

We will continue with these and other efforts with the goal of further improvement in the Fifth Five-Year Environmental Action Plan.

Amount of Discarded Materials Generated / Basic Unit per Net Sales* (All NGK Group manufacturing sites)

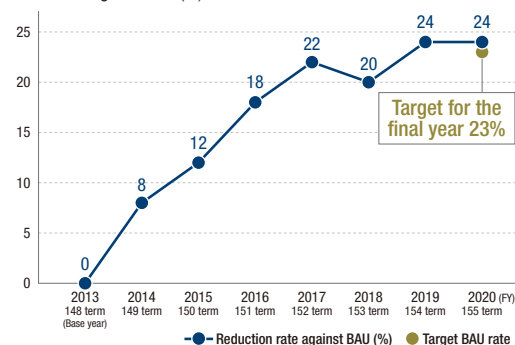
Basic unit per net sales (Metric tons/¥100 million)



*Soshin Electric, which was spun off from the NGK Group in fiscal 2020, are omitted for the whole period.

Reduction Rate against BAU* (All NGK Group manufacturing sites)

Reduction rate against BAU (%)



*Soshin Electric, which was spun off from the NGK Group in fiscal 2020, are omitted for the whole period.

Promoting Resource Recycling

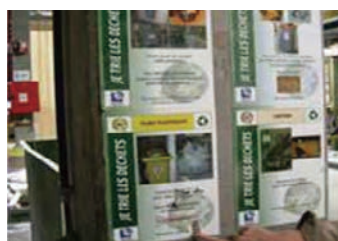
At the NGK Group, we promote resource recycling initiatives, pursuing rigorous sorting and separating practices and seeking out new methods of recycling.

In fiscal 2017, we started sharing information with our production sites in Japan regarding waste recycling methods and companies that can process such waste. This has allowed us to choose highly reliable waste processing contractors and continue to improve waste recycling efficiency. Through such ongoing efforts, we have managed to sustain a domestic recycling rate of 99% or higher since fiscal 2013, which is the target set under the Five-Year Action Plan.

Meanwhile, at our Group companies outside Japan, where the situation varies according to country and region, suitable targets are set taking into account circumstances specific to each location. The average recycling rate at the 21 overseas Group manufacturing companies has remained at over 90% (with the exception of three companies that generate non-recyclable waste).

Examples at Group Companies Outside Japan

At Group companies outside Japan, waste material separation management is strictly enforced. Waste separation rules are posted where waste materials are stocked and color-coordinated containers are provided for each category of waste to avoid confusion.



NGK Ceramics Europe



NGK Ceramics USA

Risk Management of Water Resources and Response

The NGK Group recognizes the management of water resources as an important issue for the company in achieving a sustainable society, and promotes relevant initiatives as described below.

Water Risk Evaluation

To ascertain water supply risks for each of our production facilities in and outside Japan, the NGK Group performed a simplified internal survey to assess water shortage risks based on the water supply capacity of rivers in the respective regions. For production facilities located in areas where there is a risk of water shortages, particularly overseas, we commissioned a third party to conduct a comprehensive survey. As part of that survey, in addition to the water supply capacity of rivers, factors such as groundwater, seasonal fluctuations in water supply capacity, and the holding capacity of dams are evaluated and used to create water supply/demand forecasts. The risk of water-related disasters (flooding, landslides) and water quality deterioration (public health, ecosystem) is also analyzed as part of a comprehensive risk assessment.

These efforts allow us to determine water risk at all overseas manufacturing sites, information that we share among all of our sites.

Although no serious water-related risks have been identified to date at any of our facilities, we stay abreast of regulatory trends and we strive to make more efficient use of water.

Number of Manufacturing Bases Outside Japan with Inherent Water-Related Risks

Region	Number of bases	Water supply/demand		Disasters	Vulnerability to pollution	
		Current	2040		Public health	Ecosystems
North and Central America	5	0	1	0	0	0
Europe, other	5	2	0	0	2	3
China	3	0	0	0	0	0
Asia, Australia	7	0	5	0	1	1

Promoting Efficient Water Use at Group Companies

NGK created guidelines (an implementation status checklist) aimed at appropriate water usage and, in fiscal 2015, launched inspections to ascertain the efficiency of water usage at all manufacturing sites in and outside of Japan. Going forward, we will enhance these guidelines through internal and external case studies while encouraging efforts at each location to strengthen the operational structure against a future tight water supply.

NGK Ceramics Mexico, S. de R.L. de C.V.

We use precious local water resources as appropriately and efficiently as possible, including the recycling of water used inside plants, at Group companies located in highly water-stressed regions.

For example, at NGK Ceramics Mexico, manufacturing process waste water is filtered using reverse osmosis membranes and the recycled water is reused as coolant and boiler water or sprinkled on vegetation. Since production lines went into full operation in fiscal 2014, the basic unit of water usage per production volume has improved with each year.

The fifth Five-Year Environmental Action Plan, which starts from the current fiscal year, we will begin managing water consumption at Group companies on the basic unit per net sales to promote effective water use.



Filtration device using reverse osmosis membranes

Cooperation with Suppliers

Believing that it is important to address issues related to water resources throughout the supply chain, the NGK Group asks its suppliers to practice water resource-related risk management and efficient water usage in accordance with the CSR Procurement Guidelines. In fiscal 2020, 99.9% of companies in NGK's domestic supply chain agreed to our request.

Initiatives Toward Harmony with Nature

Protecting Biodiversity

In the NGK Group, we view the challenge of protecting biodiversity as an integral part of achieving a sustainable society, and towards that end we are undertaking the following activities.

Activities for Achieving the Aichi Targets

The NGK Group has been pushing forward with activities pursuant to the Aichi Targets (international goals for biodiversity) agreed upon at the 10th Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10).

Since fiscal 2016 under the current Five-Year Action Plan, we have done biodiversity surveys of company-owned sites, taken part in the Ministry of the Environment's "My Action Declaration" initiative, and worked in unison with our suppliers.

Promoting Participation in the "My Action Declaration" Initiative

In fiscal 2017, as a way of raising awareness among employees, we began promoting participation in the "My Action Declaration" initiative led by the Japan Business Federation and the Ministry of the Environment. This project aims to have by 2020 a million people make a declaration to take action to conserve biodiversity.*

NGK continues to use this initiative as an opportunity to raise awareness among employees and has expanded it throughout NGK Group companies in Japan, attracting a cumulative total of 6,800 group employee declarations thus far.

* To be extended until October 2021.

My Action Declaration card

Aichi Targets		NGK Group Activities
Target 1	Spread awareness	People are aware of the value of biodiversity and actions to be taken to conserve it.
Target 4	Sustainable production and consumption	Stakeholders at all levels have taken steps to achieve sustainable production and consumption.
Target 5	Inhibit loss of all natural habitats	The rate of loss of all natural habitats, including forests, is at least halved, and degradation and fragmentation is significantly reduced.
Target 8	Control pollution by chemical substances, etc.	Pollution from use of chemicals, including fertilizers and agrichemicals, has been brought to levels that are not detrimental to the ecosystem.
Target 9	Alien species	Invasive alien species are controlled or eradicated.
Target 11	Conserve protected areas	At least 17% of terrestrial and inland water areas and 10% of coastal and marine areas are placed under appropriate conservation management.
Target 14	Ecosystem services	Ecosystems that provide essential natural services are restored and safeguarded.

Note: Source: "Guidelines for Action by the E&E Industries concerning Biodiversity Conservation" (The Biodiversity Working Group, The 4 Electrical and Electronic Industry Associations)

Cooperation with Suppliers

We have added to the CSR Procurement Guidelines items pertaining to water resource-related initiatives and biodiversity conservation initiatives. We have won the agreement of 99.9% of our suppliers in Japan to comply with the expanded Guidelines.

Biodiversity Survey of Company-Owned Site

At an NGK employee welfare facility located on the outskirts of Nagoya City, we carry out periodic summer and winter surveys of birds, plants, and insects. Among the diversity of wildlife confirmed, no alien species that require urgent action has been found, meaning that biodiversity is being adequately maintained. The results of the surveys are displayed on panels at the facility in order to raise awareness of the area's biodiversity among facility users.



Biodiversity survey

Employee Volunteering

NGK bases work with local governments and NPOs in community service, and this includes contributing to the preservation of biodiversity.

Employees of NGK Okhotsk (in Abashiri, Hokkaido Prefecture) help the Lake Abashiri Mizu-to-Midori-no-kai (Water and Greenery Association) in its activities to preserve Asian skunk cabbage colonies. These efforts have been held twice a year, in spring and autumn, since 2009 as one way to conserve the local natural environment.

Employees of the Ishikawa plants of NGK and NGK Ceramic Device join local citizens every year in cleaning up the Neagari coastline in Nomi, Ishikawa Prefecture. Ocean plastic pollution has become a worldwide problem in recent years, not only spoiling the aesthetic beauty of beaches but also presenting serious threats to ecosystems. To help alleviate this problem NGK employees join beach cleanups conducted under Ishikawa Prefecture's Clean Beach Ishikawa initiative every year.

Group companies outside Japan are also doing their part for the environment. NGK Electronics Devices Malaysia (in Penang) takes part in tree-planting activities of the Forestry Department of Peninsular Malaysia. In fiscal 2019, employees joined mangrove planting in a forest reserve in Nibong Tebal, Penang. By planting trees in this way, the effort raises employee awareness of the importance of environmental protection and ecosystem maintenance.



Employees help preserve Asian skunk cabbage colonies
NGK Okhotsk



Employees in beach cleanup
NGK Ishikawa Plant, NGK Ceramic Device Ishikawa Plant



Joining mangrove-planting in Malaysia
NGK Electronics Devices Malaysia

Creating Products That Contribute to the Environment

The NGK Group considers contributing to society through business activities to be one of its most important missions. For nearly a century since its founding, NGK has made use of accumulated technologies to develop and provide products and technologies that reduce burdens on the global environment.

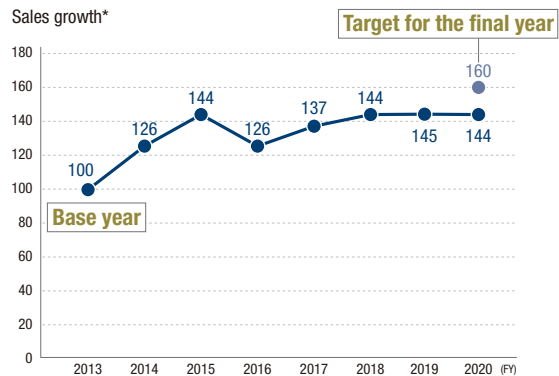
Development and Distribution of Products Contributing to Environmental Protection

Under our fourth Five-Year Environmental Action Plan initiated in fiscal 2016, NGK has set a goal of increasing sales of products that contribute to environmental protection by 60% compared with fiscal 2013 (and maintaining the sales percentage for products contributing to environmental protection at over 50% of all products).

In fiscal 2020, sales of products that contribute to environmental protection increased by 44% over fiscal 2013, which fell short of our fiscal year goal of 60%. Demand was down from forecasts due to factors such as a cooling down of the global economy from the effects of the COVID-19 pandemic.

We have a total of nine products that contribute to environmental protection, including two registered last fiscal year: gallium nitride (GaN) wafers and micro-lenses for ultraviolet LEDs. We are currently developing other products that contribute to environmental protection; for example, zinc rechargeable batteries, fuel cells, and subnano-ceramic membranes.

Sales Growth for Products Contributing to Environmental Protection (NGK Group)



*Figures are indexed with fiscal 2013 set at 100.

Definition of NGK Products That Contribute to Environmental Protection

- 1) Certified or awarded by third-party institutions
- 2) Control or reduce impact on the Earth's environment
- 3) Reduce impact on the local environment

NGK Group Products Contributing to Environmental Protection

HONEYCERAM®

HONEYCERAM is a ceramic substrate for catalytic converters to purify harmful contents in the exhaust of automobiles. It carries a catalyst that detoxifies harmful substances by chemical reaction, and its honeycomb structure provides a greater contact surface area for the exhaust and thus gives better purifying performance.

Since the launch of mass production in 1976, over 1.5 billion units have been shipped of this essential ceramic product for purifying exhaust. NGK's HONEYCERAM eliminates a total of four million metric tons of NOx per annum*¹, equivalent to double the annual NOx emissions in Japan*².

*1 Assumption based on installation of exhaust gas system in new cars that are not equipped with such systems

*2 Source: OECD Environmental Statistics (2012)

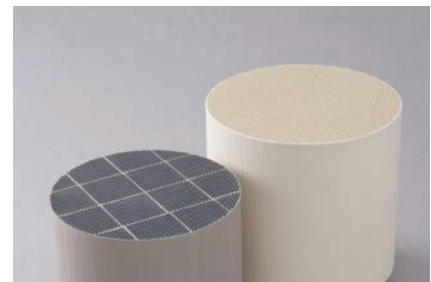


NOx elimination: 4 million metric tons annually

Diesel Particulate Filters (DPF)

The DPF is a porous ceramic filter used worldwide in the exhaust systems of diesel vehicles. With a pore structure, the filter ensures particulate matter (PM) is captured to purify the exhaust emitted from diesel vehicles. NGK is the only company to produce two types of DPFs based on both cordierite and silicon carbide. NGK's ceramic technologies support further developments for diesel vehicles.

The honeycomb structure, where the inlet and outlet of the through-holes are alternately sealed, enables the thin ceramic walls to efficiently capture PM while exhaust passes through.



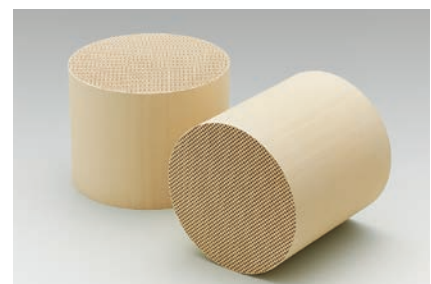
Eliminates up to 99% of PM

Gasoline Particulate Filters (GPF)

GPFs are ceramic filters that remove particulate matter (PM) from the exhaust of gasoline-powered vehicles.

We developed this filter based on diesel particulate filter (DPF) technology, and succeeded in producing a GPF that can achieve high performance (captures more PM) and low pressure loss (lower fuel costs and higher output) at the same time through the use of our proprietary micropore creation and control technologies. We were the first to commercialize a GPF in 2012, and commenced mass production in January 2016 at one of our subsidiaries.

As automobile emission regulations throughout the world become stricter, we expect that demand for GPFs will increase. To respond to this demand increase, we are boosting production capacity.



In-Vehicle High-Precision NOx Sensors

NGK developed the world's first in-vehicle sensor to measure concentrations of nitrogen oxides (NOx) in exhaust in real time with high precision. Specifically, the sensor is capable of measuring NOx concentration at the parts per million (ppm) level and can thus detect even very small amounts of the noxious substance. The sensor supports precise control of the exhaust purification device used in diesel vehicles, which leads to a reduction in NOx emissions and helps to promote the use of clean diesel vehicles.



NAS® Batteries

Providing clean energy that burns no fossil fuels and releases no CO₂ emissions, renewable energy is on the rise worldwide. The NAS battery stabilizes fluctuations in the output of renewable energy such as wind and solar power—which are susceptible to weather conditions—by appropriately storing and discharging the electricity provided.

Increases in the amount of renewable energy depending on the season or time of day lead to electricity surpluses that make it difficult to constantly balance electricity supply and demand. NAS batteries use their high capacity to store excess electricity and enable supply-demand balance, thus making more widespread use of renewable energy practical.



Installed at over **200** locations worldwide with a **580 MW/4000 MWh** capacity

Note: As of June 2021

Low-Level Radioactive Waste Treatment Systems

NGK has developed a wide range of systems to safely treat low-level radioactive waste generated from nuclear facilities and has supplied these systems to nuclear power stations and related facilities across Japan. The systems are developed utilizing NGK's proprietary treatment technology and high-performance filter-based dust collection technology.

We undertake a variety of engineering projects including design, manufacturing and site construction, and also provide a long-term maintenance service to deliver stable and high-level radioactive decontamination. NGK thereby provides essential support for the safe and stable operation of nuclear facilities.

In addition, we focus on the development of new systems for treating various types of radwaste expected to be generated from the decommissioning and dismantling of aging nuclear reactors.



Importance of Treating Radioactive Waste

When treating and disposing of waste generated in radiation-controlled areas, including nuclear power stations, it is critically important to prevent the spread of radioactivity via the release of radioactive matter. This requires special treatment and disposal methods that differ from those for general waste.

Wavelength Control Drying Systems

Our wavelength control drying system uses a proprietary heater unit developed in-house to promote the evaporation of solvents.

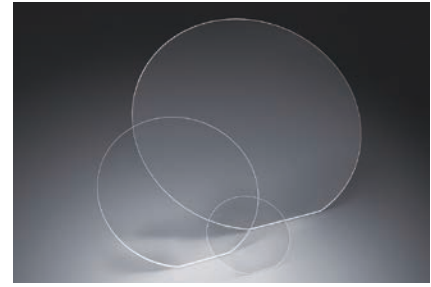
This system uses specific infrared frequencies to effectively facilitate evaporation, shortening drying time to approximately 1/2 to 1/3 of that required for conventional drying methods using heat, and reducing power consumption by 30 to 50%. It is also possible to suppress binder segregation, which is an expression of variations in concentration that occur due to drying of the soluble component in films during drying, by 30 to 40% (in-house binder segregation study).



Gallium Nitride (GaN) Wafers

This low-defect density gallium nitride (GaN) wafer uses NGK's original crystal growth method covering the entire wafer. With the Minamata Convention on Mercury going into effect in August 2017, there is expected to be high demand for high-output, high-efficiency semiconductor lasers using GaN wafers as a substitute for ultra-high-pressure mercury lamps. They are expected to see use in light sources for projectors, stadium lighting, car headlamps, and other products.

We see applications for the gallium nitride (GaN) wafer in high-frequency devices for next-generation 5G wireless base stations, and power devices key to realizing a low-carbon society such as inverters for electric vehicles and power conversion equipment for photovoltaic power.



Micro-Lenses for Ultraviolet LEDs

Micro-lenses for UV LEDs are transparent quartz glass lenses developed by NGK that are used in UV LEDs in place of mercury lamps. Mercury lamps are currently used in light sources used in applications such as the sterilization of water and air. However, factors such as the Minamata Convention going into effect are increasing the likelihood that mercury lamps will be banned and sparking interest in UV LEDs that do not use mercury. NGK's micro-lenses for UV LEDs are characterized by a cavity that holds a UV LED chip, a feature that improves UV LED efficiency and lowers costs.



Environmental Labeling and Declarations

Because the majority of products handled by the NGK Group are B2B products, environmental labeling is not applicable; however, we work to accommodate customer preferences with regard to this on a product-by-product basis.

Environmental Education and Communication

Participating in Local Environmental Education

In accordance with the Guidelines for Environmental Action under NGK's Core Policy on the Environment, we conduct ongoing environmental education and awareness activities aimed at increasing employee environmental awareness. Our aim is to deepen the understanding of environmental problems among each employee to inculcate an awareness of environmental conservation activities.

We also conduct environmental events and provide information to a wide range of stakeholders, including on-site classes at elementary schools, to increase environmental awareness.

Offering Guest Lectures at Elementary Schools and Children's Centers

NGK sends instructors to participate in lectures and workshops for young people that are hosted each year by EPOC (Environmental Partnership Organizing Club)*. Our instructors offer classes on water resources and usage in which children can experience how soil can purify water.

So far, a cumulative total of 2,300 people have participated in environmental education programs with which NGK is affiliated.

* EPOC (Environmental Partnership Organizing Club): A voluntary organization consisting mainly of companies in the Chubu region of Japan, which was established in 2000. Its purpose is to spread information regarding the environment with the aim of building a recycling-oriented sustainable society. NGK has been involved in the planning and management of this organization since its establishment. EPOC currently has approximately 260 members.



Sharing Information with Other Companies

The EPOC subcommittee led by NGK organizes seminars and field trips several times a year under the theme of corporate environmental management (low carbon, resource recycling, biodiversity, water resources, environment-related laws, etc.) and sends out information to members. In fiscal 2020, this was handled via online distribution.



Support for the Kagayake☆ Aichi Sustainability Research Institute

NGK took part in the "Kagayake☆ Aichi Sustainability Research Institute" project launched by Aichi Prefecture and aimed at university students, who represent the future of Aichi. This project is being directed by Aichi Governor Hideaki Omura and is focused on achieving sustainable eco-action by globally minded university students on environmental challenges put forward by companies.

In fiscal 2020, 10 companies in Aichi Prefecture took part in this project. The challenge we put forward was to work with NGK in developing an educational program that gets children thinking about a sustainable future. The four-member team of university students who took part in this challenge was proactive about engaging in discussion and collaboration with NGK employees, even in the face of severe restrictions on face-to-face meetings, plant tours, and other interactions due to the COVID-19 pandemic.

The end result was a proposal whose theme was: "Partnering up for happiness! How can we make a happier future together?" Team NGK created a classroom program that resonates with NGK's mission and philosophy of "Enriching Human Life by Adding New Value to Society" and creates opportunities for elementary school students to think freely and positively about environmental challenges and how they can be addressed in order to actively change the future for the better. The program content was presented at a meeting for final results reports where it was quite well received, earning top prize. NGK is now making plans for school visits in order to actually put this program into action.



Employee Environmental Training and Skills Development

Environmental Education inside the Company

We conduct position-based training related to environmental management systems to familiarize employees with the aims and content of NGK's environmental policies. We also provide specialized environmental training courses for personnel who will be directly involved in environmental management, as well as special environmental training for the entire workforce.

Fiscal 2020 Specialized Environmental Training

This fiscal year, in order to foster more robust compliance, training sessions were increased from one to two times per year. These sessions were carried out online in order to prevent the spread of COVID-19.

(1) Managing machinery that uses CFCs

Held in October, 346 participants.

(2) Environmental law and NGK

Held in March, 270 participants.

Promoting the Acquisition of Qualifications

To continue conducting environmental conservation activities in compliance with laws and regulations, we make an effort to develop and increase the skills of legally qualified personnel. We provide support in each department for the acquisition of environment-related legal qualifications targeting managers engaged in pollution prevention required for the management of each site.

We systematically educate Qualified Energy Managers in the Engineering Department, and Special Controlled Industrial Waste Managers and others involved in waste-related activities in the Environmental Management Department and other business divisions.

Qualifications Acquired as of March 31, 2021 (NGK) (Persons)

Pollution Control Managers			Qualified Energy Managers	Special Controlled Industrial Waste Managers	Waste Disposal Facility Technical Managers
Air	Water	Noise/Vibration			
72	58	14	12	18	9

Support for Acquisition of Eco Test Certification

With the aim of ensuring that each employee acquires a strong environmental awareness and a wide range of knowledge with respect to the environment, NGK encourages employees sitting the Eco Test* by lending them reference materials and subsidizing test-related expenses.

To date, a total of 782 people—approx. 20% of all NGK employees—have passed the test.

Eco Test Certification

Fiscal year	2016	2017	2018	2019	2020
Number of successful examinees	120	125	90	37	73

* The Eco Test is an environmental and social certification test administered by the Tokyo Chamber of Commerce and Industry focused on a wide-range of environmental issues.

Fiscal 2020 Specialized Environmental Training

Around 700 people took part in a Web-based seminar entitled, "Moving Towards a Decarbonized Society and a New Corporate Paradigm" conducted by outside experts invited by NGK.

NGK Eco Point System

NGK promotes its Eco Point System in an effort to contribute to regional environmental improvement. Employees earn points for environmental behavior conducted at work and in the home, a portion of which is converted into cash and donated to local government-managed funds (environmental funds).

In addition to the company's three sites in Nagoya, Komaki and Chita and the Ishikawa Plant, the system was newly introduced to the Tokyo Main Office and Osaka Branch and sales offices in fiscal 2016.

Donation of NGK Eco Points

The NGK Eco Points earned by individual employees through their engagement in environmental activities are aggregated on an annual basis for each site (Nagoya, Chita, Komaki, Ishikawa), and top scorers are commended every year. For earned points, employees select from two options: exchange for eco goods or donate to local funds. The number of employees choosing donation is growing every year, indicating increasing environmental awareness.



From left: Kazuhiro Hasegawa, environmental manager at NCDK Ishikawa Plant; Mayumi Seto, leading Eco Point earner for NCDK Ishikawa Plant; Mayor Ide of Nomi City, Ishikawa Prefecture; Yukari Yamaguchi, last year's top Eco Point earner for NGK; Takahisa Kaneko, environmental manager at NGK Ishikawa Plant

Social

Communication with Stakeholders	49
Human Rights	51
Quality Activity	56
Employees	62
Human Resource Development	71
Securing and Retaining Human Resources	75
Occupational Safety and Health	76
Health Management	80
Work-Life Balance	83
Social Contribution Activity	87

Communication with Stakeholders

In addition to promoting understanding regarding the NGK Group among customers, suppliers, shareholders, investors, regional communities, governments, international organizations, universities, research institutes, and employees, we are continuously improving our activities and initiatives through dialogue with all of our stakeholders.



Basic Approach

In the NGK Group Code of Conduct revised in January 2019, our commitment to “Disclosure of Company Information and Accountability” as a part of stakeholder communication is expressed through the following.

Disclosure of Company Information and Accountability



- **We will increase healthy and transparent management by active disclosure of information and discussion with stakeholders.**

- We will accurately and promptly disclose information required by society.
- We will take seriously the voices of our stakeholders and fulfill our obligation of accountability.

Reference
URL

NGK Group Code of Conduct

<https://www.ngk-insulators.com/en/sustainability/guideline/>

Stakeholder Engagement

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.	Enhance customer services Quality improvement	Official website Contact desk Participation in exhibitions Open innovation
Procurement Partners	With a basic policy centered on the three principles of openness and fairness, partnership, and relationship with society, the NGK Group is engaged in fair, free, and transparent business transactions with the procurement partners 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.	Realize fair, free, and transparent transactions Exchange information with suppliers Establish better supply chain	Financial results presentations Supplier helpline Individual visits to suppliers in Japan and overseas
Shareholders and Investors	The NGK Group aims to meet expectations for enhanced corporate value through dialogues and efforts to disclose information pertaining to management, finance, products, and services in a timely and appropriate manner.	Enhance corporate value	General Meeting of Shareholders Information sessions Individual visits and interviews Participation in IR events Responding to ESG investment Official website
Employees	The NGK Group strives to create a safe and comfortable workplace environment with respect for employee humanity. We also support the growth of human resources and fair treatment enabling each employee to maximize their skills.	Respect the human rights of employees Develop safe and comfortable workplace environments Conduct surveys on workplace environment and employee satisfaction Inculcate corporate philosophy and policies	Company newsletter <i>Global MIZUHO</i> English-version company newsletter In-house video newsletter Intranet Labor-Management Advisory Board meetings, regular Labor-Management Council meetings Survey on workplace vitality CRS (Corporate Risk Survey) Helpline Hotline
Regional 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.	Contribute to regional communities as a trusted corporate citizen	Collaborative activities with NPOs, etc. Volunteer activities by employees Social contribution activities in cooperation with labor unions Invitation to plant tours and events
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.	Promote initiatives to solve social issues	Participation in international initiatives
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 solving social issues.	Develop scientific technologies Develop technologies that will contribute to solving social issues	Joint research

Human Rights

Basic Approach

Within the NGK Group, our relationship with employees is governed by the NGK Group Code of Conduct revised in January 2019 and is based on “Respect for Human Rights” and “Provide a Safe and Enjoyable Work Environment” in accordance with the following. In addition, we have created the CSR Procurement Guidelines for use with suppliers.

Respect for Human Rights



- **We will strictly comply with international standards of human rights and respect the diversity of all people.**

- We will respect human rights and undertake business activities without the use of forced labor or child labor.
- We will respect the individuality and independence of each employee and not engage in discrimination on the basis of race, citizenship, gender, age, religion, belief, existence of handicaps, sexual diversity or any other aspect.
- We will prevent the occurrence of harassment in the workplace and take prompt and appropriate action in the case where it occurs.

Provide a Safe and Enjoyable Work Environment



- **We will provide a safe and enjoyable work environment that is comfortable for everyone to work in for all.**

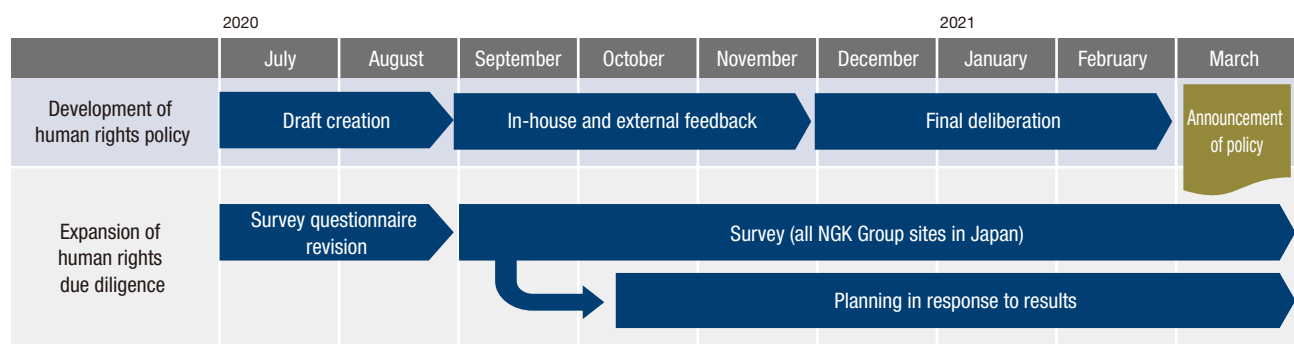
- We will strictly comply with laws and regulations of each country and region relating to labor, safety and sanitation.
- We will aim to harmonize work and life, and support a variety of working styles.
- We will build up a relationship of trust through sincere debate and discussion with employees.
- We will give educational opportunities to employees and provide opportunities to stretch their motivation and abilities.

Protecting Human Rights and Establishing an HR Committee

The NGK Group complies with international human rights standards and respects all aspects of employee diversity, including racial, nationality, and gender diversity. Our basic hiring policy is to recruit diverse personnel and to provide them with stable employment and equal opportunities. In April 2020, we established the HR Committee as a cross-sectoral, deliberative body 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.

In fiscal 2020, we focused on the following human rights initiatives.

1. Development and announcement of human rights policy
2. Expansion of human rights due diligence across all NGK Group sites in Japan



NGK Group Human Rights Policy

The NGK Group hereby establishes this “NGK Group Human Rights Policy” based on the “United Nations Guiding Principles on Business and Human Rights” and will promote initiatives to respect human rights to prevent violation or abuse of human rights of anyone impacted by the NGK Group’s business operations.

1. Basic Approach to Human Rights

The NGK Group conforms with the international norms set forth in the UN International Bill of Human Rights (Universal Declaration of Human Rights and International Covenants on Human Rights), the ILO Declaration on Fundamental Principles and Rights at Work, the OECD Guidelines for Multinational Enterprises, and elsewhere.

In addition, NGK Insulators, Ltd. (“NGK”), as a signatory to the United Nations Global Compact, ensures that all members of the NGK Group conform with the ten principles of the UN Global Compact.

2. Applicable Laws

The NGK Group conforms with all laws and regulations of the countries and territories in which it conducts business. When a law or regulation conflicts with internationally accepted principles of human rights, every effort is made to conform with the latter.

3. Scope of Application

This policy applies to all executives and employees in the NGK Group. It is also expected that suppliers for the NGK Group will also adhere to this policy.

4. Education and Training

The NGK Group provides all executives and employees with sufficient education and training to effectively implement this policy in the course of carrying out Group business activities.

5. Key Priorities in Ensuring Respect for Human Rights

In the NGK Group,

- We will strictly comply with international standards of human rights and respect the diversity of all people.
- We will respect human rights and undertake business activities without the use of forced labor or child labor.
- We will respect the individuality and independence of each employee and not engage in discrimination on the basis of race, citizenship, gender, age, religion, belief, existence of handicaps, sexual diversity or any other aspect.
- We will prevent the occurrence of harassment in the workplace and take prompt and appropriate action in the case where it occurs.

In the NGK Group,

- We will provide a safe and enjoyable work environment that is comfortable for everyone to work in for all.
- We will strictly comply with laws and regulations of each country and region relating to labor, safety and sanitation.
- We will respect the right to freedom of association and collective bargaining for employees as provided under the laws of each country or territory.
- We will aim to harmonize work and life, and support a variety of working styles.
- We will build up a relationship of trust through sincere debate and discussion with employees.
- We will give educational opportunities to employees and provide opportunities to stretch their motivation and abilities.
- We will emphasize free and open discussion and cultivate a healthy culture of communication.

6. Human Rights Due Diligence

The NGK Group will put in place human rights due diligence mechanisms to be used for identifying any negative impacts on human rights which stem from NGK Group business activities and then for facilitating efforts to prevent or mitigate these impacts.

7. Remedy

In the event that human rights are negatively impacted, or are suspected of being negatively impacted, by the business activities of the NGK Group or a supplier working on behalf of the Group, we will pursue sincere dialog with the parties concerned in order to find an appropriate and effective remedy.

8. Dialog and Discussion

In carrying out this policy, the NGK Group will use expertise on human rights obtained from independent external sources to help facilitate sincere dialog and discussion with stakeholders.

9. Information Disclosure

NGK will publicly disclose online, in integrated reports and elsewhere the status and results of policy implementation.

10. Administrative Authority

The director in charge of human resources at NGK will be responsible for the implementation of this policy. The Board of Directors will also monitor the status of policy implementation via regular reports provided by the director in charge.

This policy is approved by the NGK Board of Directors and signed off on by President of NGK.

President

Shigeru Kobayashi

Due Diligence Processes and Assessment

The NGK Group shall make a variety of efforts to identify, prevent and mitigate practices within the NGK's business operations that negatively impact human rights.

We carry out a Corporate Risk Survey (CRS) once every two years in order to help ascertain any latent risks to employees' human rights.

In addition, a total of 17 Group companies in Japan, including NGK, conduct a 54 question self-assessment survey which is based on the RBA* Code of Conduct and which looks at the three categories of labor, safety and health, and ethics.

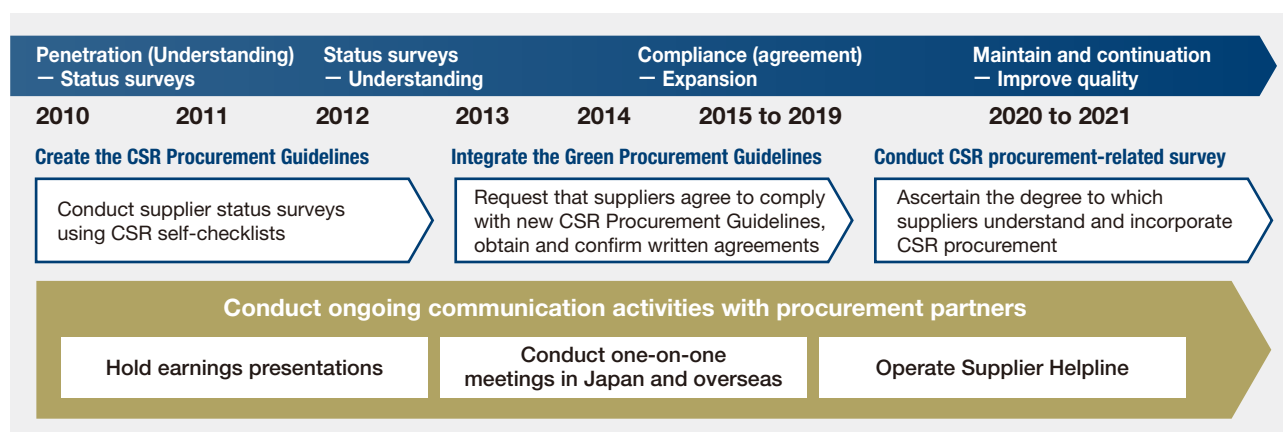
We are working to facilitate and confirm improvement in the areas identified from the survey results, and we are also working to expand the scope of this self-assessment survey to a number of NGK Group companies outside of Japan.

We also request our suppliers, particularly new suppliers, to sign an agreement to comply with the CSR Procurement Guidelines every year. In conjunction with this, we survey suppliers in order to ascertain the degree to which they understand and incorporate CSR procurement, and we then work to support CSR procurement-related improvement across all suppliers.

* 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.

► P131 CSR Procurement Guidelines

Ongoing Promotion of CSR Procurement

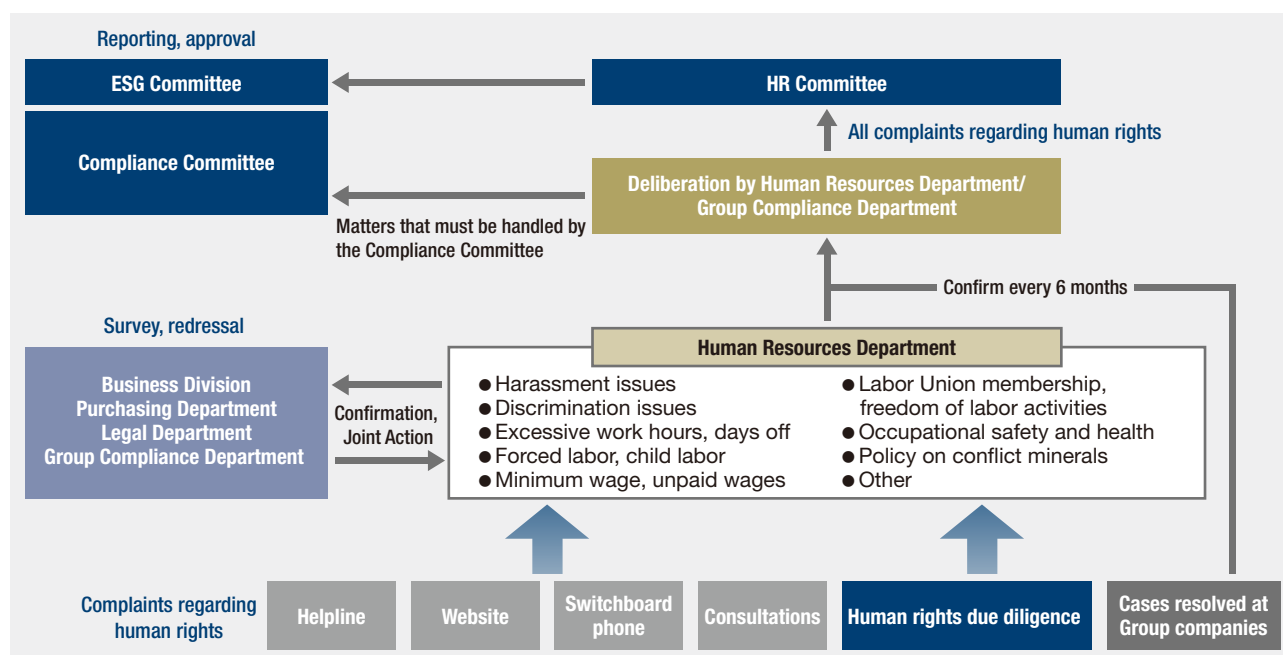


Information Disclosure

In addition to releasing the “NGK Group Human Rights Policy”, the NGK Group also conducts assessments of human rights-related risks. We also utilize an ESG Committee and Compliance Committee to address human rights-related complaints. Furthermore, we develop our relationship with our suppliers by staying in constant communication with them via visits to individual suppliers, conducting safety support activities and performing CSR procurement-related surveys.

Also, even though the results of the self-assessment carried out by NGK Group companies in Japan revealed no legally problematic issues or situations, there were some issues identified which do not align with the RBA Code of Conduct. The minor, easily fixed matters are addressed by the individual companies, while those not amenable to a quick, structural fix, but instead require medium-to-long-term study and discussion are addressed by the NGK Group using an integrated, standardized approach.

Complaints Response System



Quality Activity

Basic Approach

Guided by the Corporate Philosophy, which puts customers first, the NGK Group considers the provision of products and services that contribute to a better social environment to be one of its most important missions in an effort to create quality from the customer's perspective.

The NGK Group engages in the creation of quality from the customer's perspective by defining Quality Objectives each year in accordance with the Quality Policy based on the NGK Group Code of Conduct.

Quality Policy

NGK is dedicated to quality and committed to providing valuable products and services that are trusted by our customers and respected by society

Quality Objectives 2021

A focus on organizational self discipline is required to improve our quality of operation

Results of Initiatives in Fiscal 2020

We have been implementing quality of operation^{*1} improvement initiatives since fiscal 2018. In fiscal 2020, we undertook activities that promoted problem identification and reporting as an important element of reforming and improving organizational culture. Specifically, we expanded the scope of training aimed at boosting managers' awareness to also include section managers and supervisors, as well as encouraged each division to report their concerns. These efforts have contributed to a more widespread compliance-focused mindset and to improved quality of operation.

^{*1} Quality of operation: Level of operational systems that are in place to ensure that promises made to customers are fulfilled.

Initiatives Planned for Fiscal 2021

In fiscal 2021, we will work to put in place a system that facilitates autonomous implementation of customer-focused quality compliance activities by employees. At the same time, we will continue the efforts begun last fiscal year to facilitate autonomous QRE-P^{*2} operations at the division level.

For fiscal 2021, our goal is to cultivate a corporate culture where every employee feels a sense of personal responsibility and involvement in ongoing quality of operation improvement and refinement.

^{*2} QRE-P (Quality Risk Elimination Process): An operational protocol intended to more effectively eliminate quality-related risks at every stage when bringing products to market, from product planning to mass production.

Quality Activity System

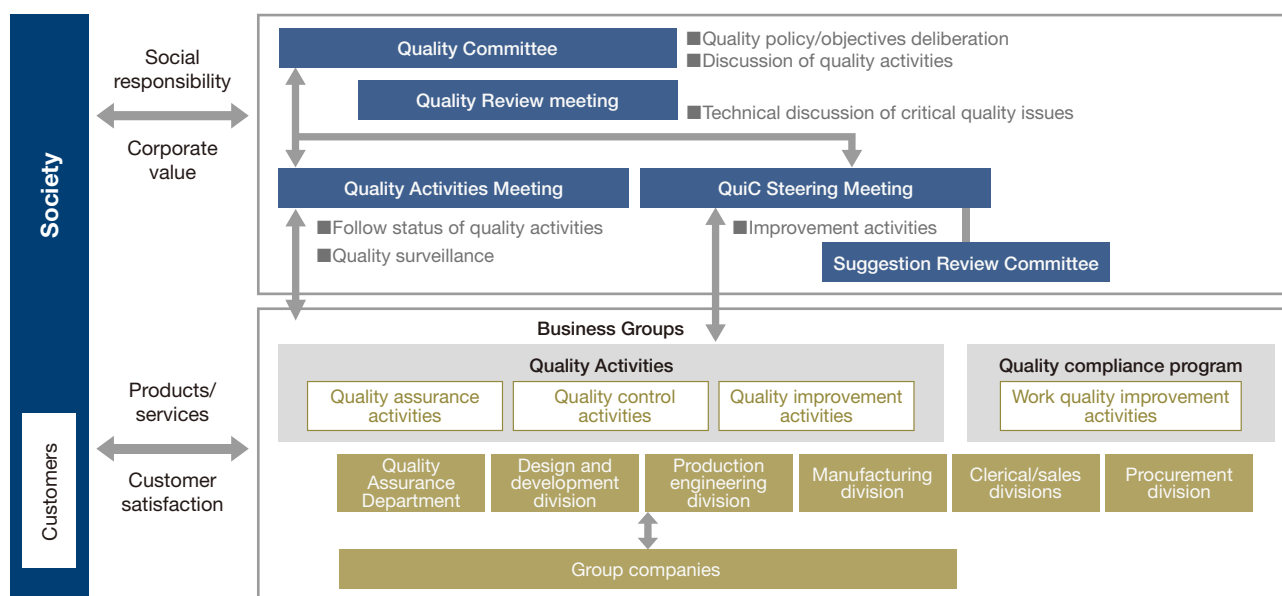
The NGK quality activity system consists of a company-wide system, led by the Quality Committee Chair, and business division internal activity systems, led by the heads of each business division. In terms of company-wide activities, the Quality Committee was established to function as a deliberative body assisting the Quality Committee Chair, while business division internal activity systems were put in place for each business line, creating appropriate quality systems for each. Quality assurance, quality control, quality improvements, and quality education activities are promoted by the acquisition of ISO 9001 or IATF 16949 certification.

Starting in fiscal 2018, we have sought to address non-conformity issues in the delivery tests by codifying standardized rules that will further strengthen our quality compliance. In addition we have expanded quality-focused activities for “quality of operation” as well as “product quality”.

In fiscal 2020, we made improvements to the business division internal activity systems, including those of Group companies, and clarified the positioning of quality assurance departments for Group companies.

Moving forward, we will undertake business division internal rule improvements and pursue systematic activities that include Group companies.

Quality Activity System



► P137 Acquisition of ISO 9001 or IATF 16949 Certification

Quality Risk Management

Four Rules for Quality Activities

The NGK Group promotes restructuring of its quality activities to respond more precisely to increasing and diversifying quality demands from customers in different target markets. In particular, quality activity rules have been formulated to enhance the elimination of quality risks in the market; we are promoting the establishment and improved effectiveness of the rules.

Quality confirmation rule

Establish milestones, from development to start of production, and confirm conformance with six quality levels when production processes change.

Quality monitoring rule

Monitor and share information company-wide with respect to quality status changes or problems concerning products or markets. Manufacturing defects and customer complaints are shared company-wide every month through reports to the Quality Management Department, and the appropriateness of countermeasures is discussed.

DR* function strengthening rule

Register DR plans with quality risks of medium or high level as important DR subjects with participation of company-wide DR reviewers. The Quality Management Department head holds company-wide DRs for cases with particularly high risk level.

*Design review

Rule for handling major customer complaints

In the event of a serious customer complaint, including a potential complaint, the situation is promptly reported to the Quality Committee Chair to formulate company-wide countermeasures.

Seeking Greater Effectiveness from Quality Activities and Innovation in Operational Procedures

We have been promoting Quality Risk Elimination Process (QRE-P) activities throughout the NGK Group. Through these activities, we can identify procedural innovations in product realization in order to eliminate risk while improving quality. Since the start of QRE-P activities in fiscal 2017, we have worked to have the QRE-P concept incorporated into divisions' rules, and also have provided practical training so that the person in charge can put QRE-P in practice, using development projects as examples.

In fiscal 2020, in addition to continuing practical training, we started the autonomous operation of QRE-P with the aim of instilling the concept of QRE-P not only in the person in charge but also in the whole division. First, we singled out focused divisions for this activity, worked together with the quality assurance departments in those divisions to come up with the best plan for the operation, and then began activities tailored to each division and product.

In order to bolster quality risk elimination and product value enhancement, we will continue encouraging autonomous operation of QRE-P at the division level for our core products, as well as support expanded implementation of QRE-P activities to Group companies within Japan and overseas.

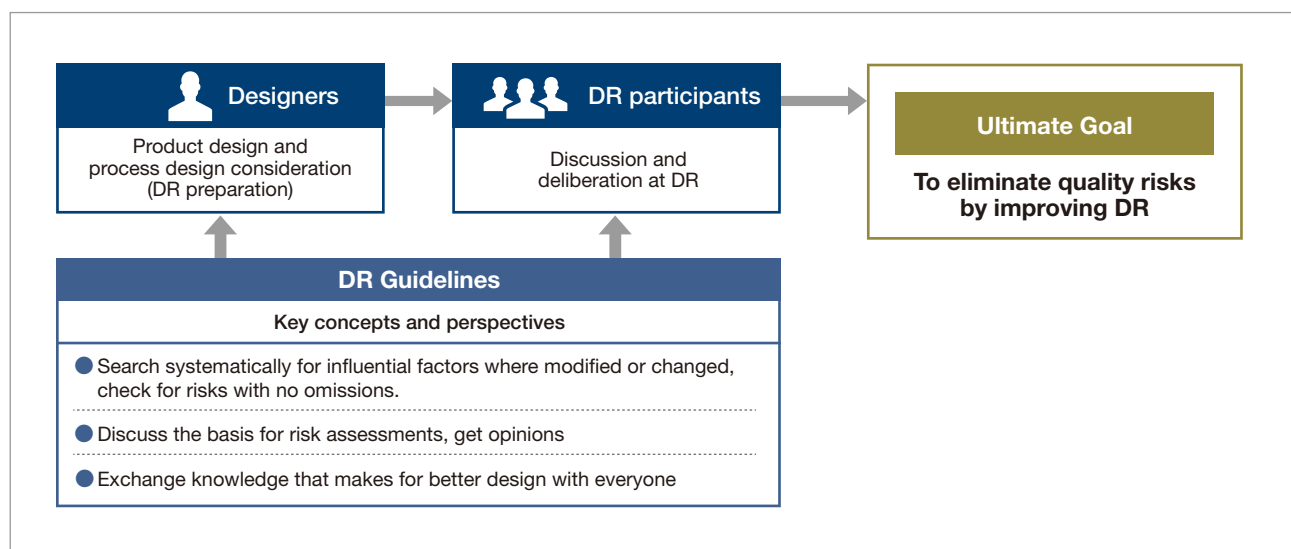
Activities to Strengthen DR Functions

The increasing and diversifying quality demands from customers call for the integration of knowledge among various members, not only from the design division but also from the manufacturing and production engineering divisions, throughout the development process. For this reason, the NGK Group considers the Design Review (DR) to be the most critical activity. DRs are conducted when development milestones are reached or when production processes change. Critical DRs are conducted by reviewers from throughout the company to support the elimination of quality risks.

The DR Guidelines were created to promote DR discussions and to thoroughly eliminate quality risks. We are constantly enhancing the effectiveness of DRs through efforts to spread these guidelines company-wide, including awareness and review of each DR.

Furthermore, NGK organizes a company-wide DR (quality review meeting) for quality issues that are difficult to solve by one division. At this meeting, relevant engineers and experts from across the company discuss broad aspects of issues related to the reliability and safety of products.

We are also deploying the above-mentioned QRE-P approach to facilitate improvement of design level at the pre-DR period as well as to ensure the more effective utilization of organizational knowledge and experience from DRs.



Quality Activities at Production Bases outside Japan

From their inception, production bases outside Japan have created quality systems appropriate to their situations and acquired ISO 9001 or IATF 16949 certification.

Monthly reports from each base regarding customer complaints and the status of manufacturing quality are discussed at quality activity meetings, enabling the entire NGK Group to evaluate the quality status in a timely manner. Moreover, quality activity rules and annual quality objectives are distributed in an attempt to develop and enhance quality activities.

► P137 Acquisition of ISO 9001 or IATF 16949 Certification

QuiC Activities to Improve Quality with Full Employee Participation

Since 2003, the NGK Group has held QuiC (Quality up innovation Challenge) quality improvement activities in which all employees participate. These activities consist of quality improvement activities by small groups or individuals and suggestions that strive to enhance the quality of production; best practices are then shared by the entire NGK Group. Every July, NGK holds a company-wide contest at its headquarters to highlight examples of outstanding improvement activities with the intent of horizontal expansion throughout the company.

In fiscal 2020, we trialed “NGK-BOX/Surprising Challenges!” as a new, online format for presentation of best practices. During this inaugural NGK-BOX event, various innovations and best practices being implemented within the NGK Group were shared with the aim of promoting Group-wide adoption. By showcasing the best practices of each division and engaging in opinion exchange with the presenters, we seek to cultivate a mind to challenge change.

A total of 11 groups, including two groups representing Group companies in Japan, presented the results of various activities aimed at improving operational efficiency, pursuing essential value, fostering a shared philosophy, reforming organizational culture, and much more. A total of around 500 employees, executives, and others watched the event online.

For fiscal 2021, two events will be held; one is a company-wide contest focused on sharing manufacturing division best practices in August, and another is an NGK-BOX event to share innovations and best practices implemented within the NGK Group in November.

Suggestion Activity Participation Rate

	FY2018	FY2019	FY2020
Manufacturing divisions	100%	98%	93%
Non-manufacturing divisions	92%	85%	83%
Clerical divisions	—	60%	50%
Number of suggestions	Approx. 28,000	Approx. 29,000	Approx. 19,000



Best practices presentation held online
NGK-BOX/Surprising Challenges!

Sending Award Recipients and Outstanding Proposal Commendation Recipients to Training in and outside Japan

Training at a Group Company outside Japan

Normally, Outstanding Proposal Commendation recipients and Grand Prize recipients visit Group companies outside Japan at the end of October through early November. However, in fiscal 2020, this overseas visit was canceled due to the COVID-19 pandemic.

We intend to resume these best practice overseas promotion activities once the COVID-19 pandemic has been contained.

Training in Japan

Every year, in late December, the Outstanding Proposal Commendation recipients and QuiC Excellence Award and Special Award recipients visited Okinawa to attend a nationwide QC Circle Conference and participate in discussion sessions about various topics, such as differences between NGK and other companies: However, in fiscal 2020 it was canceled due to the COVID-19 pandemic.

We intend to resume these best practice promotion activities in Japan once the COVID-19 pandemic has been contained.

Strengthening Quality-Related Education

The NGK Group aims to provide customers with product quality that exceeds expectations. Hence, we are continually working to improve the quality-related education that is given to all employees in order to ensure they are equipped with quality-related skills and greater quality-related awareness.

We place the greatest emphasis on practical training tied directly to each employee's job duties and Quality Management System (QMS) training aimed at promoting systemic improvement in operations. And, although some training in fiscal 2020 was delayed until fiscal 2021 due to the COVID-19 pandemic, the following training was able to be provided via online delivery and video streaming, COVID-safe classroom instruction, or some combination thereof.

Quality-Related Education in FY2020

Program name	Number of days and participants	Objectives and key characteristics of the fiscal year
QC I (NGK J technical staff)	E-learning (1 month): 120 participants Practical theme training (2 months)	<ul style="list-style-type: none"> Understand the basics of problem solving E-learning for face-to-face sessions Online consultation and 1-day report sessions for practical theme training
Study of Failure and Methodology of Creation (entire NGK Group)	Study of Failure lecture: 0.5 days; 25 participants Study of Failure seminar: 1 day each; 22 participants Study of Failure seminar/Sharing session: 1 day; 234 participants/148 participants Methodology of Creation lecture: 0.5 days; 149 participants	<ul style="list-style-type: none"> Facilitate acquisition of analytical and developmental skills needed to learn from failure through lectures, seminars, discussions, etc. Share examples of failure analysis in the company among participants and instructors and hold a new case study sharing session where participants share similar case experiences
QMS Training (entire NGK Group)	ISO/IATF standards interpretation: 1 day × 5 sessions; 503 participants	<ul style="list-style-type: none"> Understand the intent and requirements of standards; session demand accommodated via face-to-face + online (simultaneous streaming) sessions
	ISO/IATF Internal Quality Auditor training: 2 days × 5 sessions; 94 participants	<ul style="list-style-type: none"> Internal quality auditor training and accreditation Accreditation training held with acrylic screens, face guards and other measures used to control infectious spread
	Auditing Skills Development: 1 day; 16 participants	<ul style="list-style-type: none"> Learn relationship between process auditing-based QMS effectiveness enhancement and quality compliance; practical training exercises performed within a seminar setting
	VDA 6.3 Process Auditing Seminar: 1 day; 27 participants	<ul style="list-style-type: none"> Understand process auditing requirements for VDA standards Conducted with limits placed on participant numbers and with infection control measures implemented

115 Employees Pass Self-Maintenance Expert Test (Grade 1: 37 Employees, Grade 2: 78 Employees)

With the aim of achieving a higher standard for maintenance activities and of improving productivity, a number of NGK Group employees in fiscal 2020 took on the challenge of the Self-Maintenance Expert Test (Japan Institute of Plant Maintenance). This qualification is given to those who possess a broad range of knowledge and skills necessary concerning quality management, safety, and machinery maintenance, and are certified to have the ability of planning and implementing voluntary maintenance activities and giving instruction.

The NGK Group will continue encouraging employees to take the Self-Maintenance Expert Test as well as cultivate voluntary maintenance activities and stimulate greater employee motivation.

No. of Employees Who Passed

	Grade 1	Grade 2
NGK	32 (pass rate of 52%)	55 (pass rate of 79%)
NGK Ceramic Device	3 (pass rate of 50%)	23 (pass rate of 92%)
NGK Electronics Devices	2 (pass rate of 50%)	—

Employees

Basic Approach

The NGK Group implements a human resource system which enables every employee to perform at their full potential under fair treatment.

In the NGK Group Code of Conduct, our relationship with employees is based on the idea of “Respect for Human Rights” and “Provide a Safe and Enjoyable Work Environment” and defined as follows.

Respect for Human Rights



- **We will strictly comply with international standards of human rights and respect the diversity of all people.**

- We will respect human rights and undertake business activities without the use of forced labor or child labor.
- We will respect the individuality and independence of each employee and not engage in discrimination on the basis of race, citizenship, gender, age, religion, belief, existence of handicaps, sexual diversity or any other aspect.
- We will prevent the occurrence of harassment in the workplace and take prompt and appropriate action in the case where it occurs.

Provide a Safe and Enjoyable Work Environment



- **We will provide a safe and enjoyable work environment that is comfortable for everyone to work in for all.**

- We will strictly comply with laws and regulations of each country and region relating to labor, safety and sanitation.
- We will aim to harmonize work and life, and support a variety of working styles.
- We will build up a relationship of trust through sincere debate and discussion with employees.
- We will give educational opportunities to employees and provide opportunities to stretch their motivation and abilities.

Human Resource System for Group S/M/J Employees

In April 2017, NGK revised its human resource system for Group S/M/J employees to enable all employees, from the young to the experienced, to work with enjoyment and fulfillment. As NGK develops its businesses globally and promotes the creation of new products and businesses, it is essential to motivate young and middle-level employees who will take on future key roles and encourage them to demonstrate their full potential. The revised system aims to build the environment that makes these possible.

Key Points of the Revised System

Qualifications

- Developing a mechanism whereby all employees can challenge to qualify for a higher job grade.
- Clarifying the definition of each qualification.

Evaluation

- Shifting from age-based evaluation to effort- and result-based evaluation.

Retirement at age 65

- Maintaining the same level of salary after age 60.

Qualification Definitions

In order to ensure that educational background and age are not limiting factors for employees' careers, NGK maintains a merit-based system for job promotion and grade transfer.

Also, because qualification-specific role differences are made clear, employees are aware of what is required for higher level qualifications and can more readily attempt higher level job duties. The aim of this system is to reward the efforts of those with the will and ambition to move to a higher grade, as well as to facilitate each employee's journey along his or her career path.

NGK Definition of Employees

Key personnel: Employees in managerial positions

Group S: Key personnel candidates and advanced specialists

Group M: Operational and on-site leaders

Group J: Personnel who seek to actualize, and be utilized to, their full potential

Employee Basic Data

Scope of Application

For reporting in the Social section of this Data Book, scope of application differs on a case-by-case basis and is therefore specified for each article and data report.

However, basic data for employees is shown below.

Number of Employees

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of employees*1	NGK		3,937	4,142	4,119	4,224	4,316
	NGK Group		17,517	18,783	20,115	20,000	19,695
Number of employees by gender	NGK*2	Total	3,939	4,136	4,355	4,529	4,650
		Male	3,440	3,621	3,807	3,951	4,046
		Female	499	515	548	578	604
		Ratio of female (%)	12.7	12.5	12.6	12.8	13.0
	NGK Group	Total	17,824	19,406	20,578	20,409	20,195
		Male	13,620	15,013	16,167	16,010	15,920
		Female	4,204	4,393	4,411	4,399	4,275
		Ratio of female (%)	23.6	22.6	21.4	21.6	21.2
	NGK	Full-time employee	3,939	4,136	4,355	4,529	4,650
		Contract employee	131	398	507	464	287
		Temporary employee	322	392	389	395	302

*1: Includes employees from outside companies who have been temporarily assigned to the NGK Group, but excludes employees from the NGK Group who have been temporarily assigned to outside companies.

*2: Excludes employees from NGK Group companies or outside companies who have been temporarily assigned to NGK, but includes employees from NGK who have been temporarily assigned to NGK Group companies or outside companies.

Employee Composition by Region

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Employee composition by region (%)	NGK Group	Japan	39	38	37	39	37
		Asia	29	27	25	23	22
		Europe	15	18	21	21	25
		North and Central America	17	16	16	15	15
		Other	1	1	1	1	1

Retention Rate of New Hires after 3 Years

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Retention rate of new hires after 3 years (%)	NGK	Total	94.3	94.6	92.6	93.5	92.8
		Male	89.2	94.8	97.6	95.2	92.7
		Female	100.0	80.0	83.9	85.1	93.3

Employee Status

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Average age (year)	NGK	Total	39.0	38.7	38.7	38.8	39.2
		Male	39.1	38.7	38.7	38.9	39.3
		Female	38.9	38.6	38.4	38.6	38.6
Average length of service (year)	NGK	Total	14.6	13.7	13.5	13.7	14.3
		Male	14.6	13.6	13.4	13.7	14.3
		Female	14.8	14.6	14.1	14.1	14.1
Average salary (yen)	NGK		7,861,726	7,852,010	7,888,094	7,770,318	7,635,830

Diversity

It is NGK Group's basic policy to recruit human resources and offer stable employment and equal opportunities regardless of race, nationality, gender, age, religion, belief, disability, or gender identity/sexual orientation. Also, NGK undertakes a variety of initiatives aimed at employing people with disabilities, such as accepting students from special-needs schools as trainees and attending employment seminars for people with disabilities. In fiscal 2020, we hired two new employees with a disability. Among our special subsidiaries, the number of new hires was eight. These hiring activities helped us achieve a statutory hiring rate of 2.3%.

We will continue to proactively seek diversity in our workforce, and our goal for the end of fiscal 2021 is to achieve a 2.42% hiring rate for persons with disabilities.

New Graduate Hires

Note: Excluding new graduates planned to transfer from temporary to regular positions.

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of new graduate hires	NGK	Total	154	111	155	143	105
		Male	127	96	122	115	89
		Female	27	15	33	28	16

Ratio of Female among New Graduate Hires

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Ratio of female (%)	NGK	Total*	23	31	28	23	12
		Administrative-related; target 30%	27	42	44	52	33
		Engineering-related; target 20%	20	22	24	27	14

* Covers regular-position employees

Mid-Career Hires

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of mid-career hires	NGK	Total	158	135	115	105	38
		Male	139	121	101	87	33
		Female	19	14	14	18	5

Ratio of Female Employees

Item	Scope	FY2016	FY2017	FY2018	FY2019	FY2020
Ratio of female employees* (%)	NGK	12.7	12.5	12.6	12.8	13.0

* Ratio among all employees

Key Personnel (Managers)

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of key personnel (employees in managerial positions)	NGK	Total	824	865	890	900	969
		Male	808	848	870	874	940
		Female	16	17	20	26	29
		Dept. managers or higher	3	4	4	5	5
		Ratio of female (%)	1.9	2.0	2.2	2.9	3.0
	Group companies outside Japan	Ratio of female (%)	15.3	21.0	16.0	20.2	23.1

Female Directors

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of female directors	NGK	Total	—	12	12	13	9
		Female	—	1	1	1	1
		Ratio (%)	—	8.3	8.3	7.7	11.1

Number and Percentage of Employees with Disabilities

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of employees with disabilities	NGK NGK YU-Service NGK Ceramic Device	Number of people	55	57	62	135	145
		Employment rate (%)	2.03	1.90	1.92	2.20	2.35

Promoting Women's Active Participation through the Revised Human Resource System

NGK revised its human resource system in April 2017 with the aim of enabling employees in general employment positions who were engaged in routine tasks to take on a broader range and a higher level of work. The new human resource system helps career advancement by allowing individual employees to take on the challenge of moving up to a higher job grade.

In addition, for those in general employment positions in charge of doing clerical and routine work, we are striving to create an environment where both employees and their supervisors can achieve high performance by improving and consolidating their duties.

Establishment of a Career Consultation Helpdesk

In 2016, we established a career consultation helpdesk for female employees to discuss career-related concerns. At the helpdesk, certified career consultants provide support and consultation services to employees, while strictly observing confidentiality. Since 2017, we have expanded the service to make it available not only to women but to all employees.

Introduction of System to Support Early Return from Parental Leave

We have introduced a system to encourage and support employees so that they can return from maternity and childcare leave and resume their careers at an early stage.

► **P80 Work-Life Balance: Systems to Support Early Return from Parental Leave****Training for Employees Returning from Childcare Leave**

Training was provided for female employees returning after the end of their designated childcare leave period, as well as for their supervisors. During this training, participants were offered advice on how to orient their focus and coordinate their schedule in balancing work and family responsibilities, as well as how to go about developing a medium-to-long-term career plan. Despite being from different departments, all of the participants were alike in that they faced the challenges of balancing childrearing with work, and through their interactions with one another, they were able to share their stories, their struggles, and their advice.

Group J Clerical Staff Career Design Workshop

Group J clerical staff were provided with a career design workshop intended to serve as an opportunity for them to think about their future career path and work style. During this training, participants learned about their role expectations as staff members and were offered some perspective from which to think independently about their career. They met with veteran staff members (role models) who provided them with insights for their future career path and helped to dispel general anxieties that participants might have about balancing work and life. Participants not only utilized information provided by their instructors but also exchanged information with veteran staff members as well as engaged in group work to facilitate a deeper level of self-awareness and discovery.

Women's Active Participation Promotion Project: "Surprising Women"

In fiscal 2018, NGK launched its new Women's Active Participation Promotion Project. Taking women's empowerment efforts beyond just expanding support systems and providing training to supervisors, the project, called "Surprising Women," includes members from the Human Resources Department and other company departments in order to achieve a broader, company-wide perspective.

In fiscal 2020, we summarized the results of three years' worth of activities into a handbook aimed at all employees. In addition to describing the prior years' activity content and the current state of female participation in society, the handbook features interviews with successful, current employees. By making this handbook available to all employees, even those who are not currently dealing with issues related to female participation in the workplace, it is hoped that it can serve as a reference resource when the need arises to help with career development, communication between supervisors and subordinates, and other matters relating to employees' personal and professional growth.

Group J Technical Staff Career Planning Symposium

Each year the employee focus of the career planning symposium changes, and in fiscal 2020 it focused on Group J technical staff. Veteran staff members drew on their own experiences to answer participants' questions about the grade transfer test, about work-life balance time management, and about job duty-related tips and strategies. The feedback from participants was positive, with many expressing how good it was to be able to ask questions that they cannot normally get answers to because there are few women in their workplaces.

Hamada Seminar

NGK Outside Director Emiko Hamada led a seminar for executives and all key personnel called the "Hamada Seminar." With the aim of inspiring participants to think about and act upon what is needed to make NGK even better, in light of the current status of and challenges for women's workplace participation in NGK, Mr. Hamada spoke about the perspectives and experiences of female employees and offered a variety of advice on how to be mindful, as leaders of an organization, for example telling participants to "stay out of employees' family matters when at work, regardless of whether they are male or female" and that "increasingly diverse lifestyles and a rising retirement age have, for many, reshaped the career ladder into a career jungle gym." On the day of the seminar it was simultaneously live-streamed online, and afterwards it was made available to all employees via on-demand streaming.

► [P68 Hamada Seminar](#)

E-Learning for All Employees

Women's active participation e-learning was carried out with the aim of promoting proper understanding and cooperation among all employees and not just a targeted segment of participants. Easy-to-understand videos were streamed, which featured messages aimed at female employees, supervisors, and colleagues and which sought to raise awareness about unconscious bias and other topics.

Submitting Our Action Plan for Promoting Women's Active Workplace Participation to MHLW

In January 2019, in accordance with the Act on Promotion of Women's Participation and Advancement in the Workplace, NGK submitted a general employer action plan to the Aichi Labor Bureau, which is overseen by the Ministry of Health, Labor and Welfare (MHLW).

In this plan, NGK sets the goal of hiring more female employees. Accordingly, the proportion of women among new hires increased from 16% in fiscal 2012 to 34% in fiscal 2020.

We will keep working on the initiatives according to the action plan to accomplish our goals.

Action Plan

Issues

- Although there is no gender gap in terms of criteria for promotion and service years, the number of women in management positions is small.

Goals

- Foster a corporate culture that promotes women's active participation.
- Increase the number of candidates for managers by 1.5 times.

Initiative 1 Create an environment that makes it easier for women to achieve a work-life balance.

Initiative 2 Increase the ratio of women among new graduate hires and diversify career opportunities.

Female Managers in the NGK Group As of March 2021

Target category		Male	Female	Total	Ratio of female employees
NGK	Number of employees	4,046	604	4,650	13%
	Number of managers	940	29	969	
	Ratio of female managers			3.0%	
Manufacturing Group companies in Japan	Number of employees	2,449	502	2,951	17%
	Number of managers	303	1	304	
	Ratio of female managers			0.3%	
Manufacturing Group companies outside Japan	Number of employees	9,438	3,175	12,613	25%
	Number of managers	528	167	695	
	Ratio of female managers			23.1%	
Entire NGK Group	Number of employees	15,933	4,281	20,214	21%
	Number of managers	1,771	197	1,968	
	Ratio of female managers			10.0%	

LGBTQ Initiatives

In order to promote understanding of LGBTQ issues for the sake of fostering greater diversity in workplace participation, special feature articles on the topic were included in the in-house newsletter and e-learning aimed at all employees was implemented.

Helping Male Employees Have Greater Involvement in Childcare

Starting in fiscal 2021, NGK is making a concerted effort to help male employees have greater involvement in childcare. Given the heavy burden of housework and childcare responsibilities which women bear while raising children, this initiative aims to get men more involved in childcare and, thereby, reduce the size of the burden for women, foster a change in thinking for management, promote greater work efficiency and improve motivation for work which is drawn from the support of the family. A symposium is held to give participants the opportunity to speak candidly with male employees who balance child-rearing and work responsibilities and male employees who have taken childcare leave; a portion of the training for employees returning from childcare leave is opened up to spouses who are also NGK employees; and various other opportunities are utilized to foster a sense of personal responsibility and involvement among male employees as well.

Third-Party Certifications

Certified as an “L-Boshi” Company for Excellence in Promoting Women’s Active Participation

In March 2017, NGK was certified as an “L-Boshi” company by the Minister of Health, Labor and Welfare (MHLW). This certification is granted to companies that have done excellent jobs in accordance with the Act on Promotion of Women’s Participation and Advancement in the Workplace. Each applicant for the certification is evaluated on five criteria: recruitment, employment continuity, working hours, percentage of female managers, and diverse career paths. In September 2019, NGK satisfied all five criteria and received certification for level three, the highest certification level.



Ministry of Health, Labor and Welfare
Next-generation support certification logo
“Kurumin” (2012)



Ministry of Health, Labor and Welfare
“L-boshi” certification of corporate excellence in the promotion of women’s active participation
Certification level 3 (2019)

Certified as a Company Promoting Women’s Active Participation by Nagoya City*

In recognition of our efforts to create a workplace environment that encourages women’s active participation such as revising our system for transferring to career-track positions, we were certified as a Company Promoting Women’s Active Participation by Nagoya City in January 2012 and recertified in January 2018.

* A system for certifying companies that conduct outstanding initiatives in the areas of (1) awareness improvement, (2) work-life balance, and (3) promotion of women’s active participation.



Nagoya City
Certification of corporate promotion of women’s active participation
(2011)



Aichi Prefecture
Certification of Aichi
“Shining Women” Companies
(2016)

System to Promote Diversity

At NGK, the Human Resources Department plays a central role in promoting diversity, including through nursing care support, promotion of women’s active participation, and LGBTQ-related issues. Regarding human rights issues, NGK strives to educate employees by distributing booklets on human rights on occasions such as training for the recently promoted employees. A helpline is also available for consultation on these issues.

Hamada Seminar

The Hamada Seminar, which aims to foster “good work and the creation of a satisfying company,” has been held three times and is aimed at female key personnel and Group S members. This year’s seminar was the first to include executives and all key personnel, and its goal was to inspire participants to think about and act upon what is needed to make NGK even better, in light of the current status of and challenges for, women’s workplace participation in NGK. On the day of the seminar, instead of limiting attendance to just the number of participants allowed in the hall according to COVID restrictions, live-streaming and various other workarounds were also used to broadcast the seminar to a wider audience.

President Taku Oshima (currently Chairman) delivered the opening remarks, expressing his desire that female employees their full potential. Outside Director Hamada then spoke about the perspectives and experiences of female employees and offered a variety of advice on how to be mindful, as leaders of an organization, for example telling participants to “stay out of employees’ family matters” and that “increasingly diverse lifestyles and a rising retirement age have reshaped the traditional career path for many.”



NGK Outside Director Emiko Hamada

Human Resource Utilization Systems Aligned with Employee Individuality and Skills

To open the way for employees to take full advantage of their individuality and skills, NGK adopts an internal job application system, in which open positions are announced internally and eligible applicants are appointed. There is also an FA (free agent) system that allows employees to register their personal aspirations and preference of jobs to appeal themselves within the company.

Internal Job Application System

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Job application system	NGK	Number of applications	17	32	28	28	9
		Number of recruits	28	50	40	37	13
		Number of applicants	11	15	7	18	15
		Number of successful applications	4	5	2	7	6

Promoting the Regular Employment of Fixed-Term Manufacturing Contract Employees

NGK established a system for appointing fixed-term manufacturing contract employees to become regular employees, and 15 employees were appointed in fiscal 2020. Excellent employees are identified through biannual personnel assessments and recommended by division heads to sit for the regular employee promotion exam. Those who pass the exam become regular employees.

Transfers from Fixed-Term Contract Manufacturing Worker to Regular Employee

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of contract-to-regular employees	NGK	Number of people	15	20	37	41	15

Follow-up System to Fit Young Employees in the Workplace

At NGK, we follow up on younger employees in different ways after they have been placed. For example, with career-track employees, we conduct surveys and interviews about their jobs and work environment in their second year; and for manufacturing technology staff, we do this in their second or third year of employment. If they desire, feedback is provided to their superiors, leading to younger employees' job stability.

Come-Back System

Since fiscal 2016, NGK has had its Come-Back System to rehire people who had left our company for various reasons (e.g., job change, studying abroad, job transfer of a spouse, etc.) as mid-career employees. For fiscal 2021, as May 31, there have been two employees rehired through the Come-Back System.

Reference URL **Come-Back System (Japanese)**
<https://www.ngk.co.jp/recruit/comeback/>

Equal Compensation

The following are the average salaries for the NGK Group.

Employee level	Average salary for men	Average salary for women	Ratio (=Average salary for women / Average salary for men)
Manager level (basic salary only)	7,070,000 yen	6,630,000 yen	94%
Manager level (basic salary + other financial incentives)	11,420,000 yen	10,420,000 yen	91%
Non-manager level	3,590,000 yen	3,450,000 yen	96%

Labor-Management Initiatives

Freedom of Association

NGK respects workers' rights, including the right to collective bargaining, and strives to build healthy labor-management relations. As of March 31, 2021, 3,879 employees belonged to the Labor Union.

Labor Union Membership Rate

(%)

March 31, 2017	March 31, 2018	March 31, 2019	March 31, 2020	March 31, 2021
89	94	96	97	98

Note: Number of union employees / Number of NGK employees (excluding managers)
(Both figures include contract manufacturing employees)

Protecting the Right to Collective Bargaining

NGK and the Labor Union have signed a labor agreement as equal partners. The agreement specifies that both parties shall respect each other's rights and take responsibility for the exercising of their own rights.

The two sides regularly hold Labor-Management Advisory Board meetings to exchange information and promote mutual understanding. They also maintain healthy labor-management relations by exchanging opinions on issues such as management policies, financial conditions, and activities of the Labor Union.

Collective bargaining sessions are held in an orderly manner, with both parties striving in good faith to resolve issues peacefully and promptly.

Labor-Management Consultations in FY2020

Regular Labor-Management Council meeting: held twice

Labor-Management Advisory Board meeting: held twice

Other bargaining and consultations

- Consultation on overtime work and work on days off
- Consultations on changes to the agreement based on Article 36 of the Labor Standards Act (so called "36 Agreement")

Guaranteeing the Minimum Wage

NGK and the Labor Union have signed an agreement that sets out original in-house minimum wages, which are fixed at a rate above the minimum wages by region and industry stipulated by the Minimum Wage Act. Through this agreement, we strive to improve employees' working conditions and avoid violation of relevant laws.

Communication between Labor and Management

NGK makes an effort to build labor-management relations founded on mutual trust through communication with various consultative bodies, such as the Labor-Management Advisory Board, the Worksite Advisory Board, and the Regular Labor-Management Council.

NGK and the Labor Union hold Labor-Management Advisory Board meetings to talk about business conditions and performance, and Worksite Advisory Board meetings to share issues pertaining to manufacturing, work systems, and workplace environments from each worksite. In addition, at Regular Labor-Management Council meetings, labor and management also proactively exchange opinions.

Human Resource Development

Skills Development for Employees

The NGK Group puts its Group Philosophy into action by ensuring that Quality of People remain our top priority as we pursue the mission of “Enriching Human Life by Adding New Value to Society.” We do this not only through the educational programs that we offer but also by cultivating work environments and supportive supervisors capable of ensuring that each employee is able to contribute and independently grow through the work that they undertake within the environment in which they are placed.



NGK undertakes systematic human resource development, including Group companies in Japan, which encompasses every job category from employment to every promotion milestone in their career.

The education and training that we provide employees across the NGK Group, in conjunction with their departments and with the aim of putting the Group Philosophy into practice, is divided into three areas: “Human Skills” needed to tenaciously pursue results through teamwork, “Professional Competence” needed to cultivate a distinctive skill set and a proactive approach to problems, and “Compliance Requirements in Job Performance” needed to recognize and act upon responsibilities as a member of society.

Note: In fiscal 2020, training programs were temporarily scaled down in order to reduce the risk of spreading COVID-19.

Training Participant Summary (total participants)

	FY2016	FY2017	FY2018	FY2019	FY2020
Total participants	4,002	3,889	4,661	4,685	2,527
Key personnel	933	1,132	991	813	480
General employees	3,069	2,757	3,670	3,873	2,047

Average Annual Hours Spent for Training per Full-Time Employee (hours)

	FY2016	FY2017	FY2018	FY2019	FY2020
Average hours	24.8	21.7	21.3	21.4	6.0
Key personnel	13.1	15.6	12.8	12.3	4.2
General employees	28.8	23.3	25.0	23.7	6.4

Average Annual Cost of Training per Full-Time Employee (¥10 thousand)

	FY2016	FY2017	FY2018	FY2019	FY2020
Average expenses	7.0	6.6	6.3	5.3	2.2

Fiscal 2021 Company-Wide Education Scheme

[illegible]

Key Personnel Competencies

In order to improve the managerial skills of key personnel and, thereby, contribute to greater organizational vitality, we have defined the “key personnel competencies (behavioral traits)” that are expected of key personnel in NGK.

As the diversity of our human resources continues to increase, we want to put in place a structure that promotes a shared awareness across our company to enable key personnel to effectively contribute to business performance.

We have established key personnel competencies for the sake of achieving the following aims.

- Ensure key personnel have a correct understanding of their expected roles so that their performance meets the expected contributions of those roles to company development.
- Ensure key personnel candidates have a clear vision for themselves, and promote their growth towards recruitment as key personnel.

Training programs by objective

Values

NGK training and education seeks to foster an understanding of the NGK Group Philosophy and Code of Conduct such that employees will not simply work for the sake of meeting their individual job targets, but rather will think about the significance of the work they perform and the basis for their decision-making, leading to a sense of pride and shared identity as an NGK employee. It is not enough for employees to know what the NGK Group Philosophy and Code of Conduct are; we want employees to incorporate them into their behavior.

This approach is particularly evident in the corporate history training program that was launched full-scale in 2017 for every level of employee, from new hires to those promoted to managers. It is also incorporated into the educational programs of Group companies outside Japan in order to reach a variety of personnel. We will continue to develop and expand such programs.

Business Skills

We carry out training designed to equip employees with the mindset, knowledge, and skills they need to carry out their jobs. To ensure that the skills employees acquire are applicable and directly contribute to the work that they perform—i.e., practical skills instead of just knowledge—we provide coaching in cooperation with the participants’ supervisors and training programs for handling challenges directly relevant to their own departments.

Career Support

In order to ensure that as many personnel as possible are able to actively participate in and contribute to the functioning of NGK, we provide employees with career development support in the form of a variety of effective HR initiatives, such as promoting the active participation of women and extending the mandatory retirement age. This support is focused on cultivating personnel capable of thinking outside the limits of predetermined career models to chart their own career path.

Career design training programs for women, employees in their 50s, and others serve as opportunities for employees to think about who they want to be and how they can challenge themselves in their work to grow to become that person.

To this end, we are continuing to focus on ensuring that every employee is able to work to their full potential within the context of the many and varied environments that comprise the NGK Group.

Compliance Requirements in Job Performance

We provide employees with training that communicates to them the responsibilities, which NGK bears as a corporate citizen, as well as what this requires of them as employees of NGK. This training seeks to instill a strong sense of ethics and a commitment to doing what is right.

The fundamentals of NGK business—safety, quality, environment, and CSR—are inculcated from the time an employee joins the company to every time they receive a promotion so that knowledge ends up being reliably translated into action.

Manufacturing Training

We pursue training aimed at conveying the central importance of safety, the environment, quality, timely delivery, and cost in manufacturing while passing on the traditions and spirit of NGK manufacturing. This training also aims to grow employees into individuals who can support the creation of new value.

Towards this end, we provide training in specific technologies that will deepen employees' understanding of NGK products and technologies, as well as provide training in administrative and improvement techniques that will equip employees with the mindset and means to improve their workplaces.

Manufacturing basic training is centered on practical training tied to the actual manufacturing process. It involves teaching participants about ceramic technologies and manufacturing in general at NGK so that they will have a broad perspective, which they can apply in their work.

Worksite capability enhancement training cultivates human resources capable of making managerial contributions as manufacturing worksite leaders who independently pursue worksite capability improvements together with others both in and outside of their plant's organizational framework.



Innovation Training

The aim of innovation training is the cultivation of leaders suited to an era of transformation and speed. This is achieved by fostering outside-the-box thinking coupled with an ability to think and act to bring an idea to fruition.

In the program for young employees with leadership potential, participants learn about the essential innovation processes involved in generating new business. The program is held jointly with other companies. This allows interaction with employees from other companies who have different experiences and values, thus helping NGK employees develop a more multifaceted perspective.

Corporate History Training

This training program looks at the history of NGK in order to reexamine the origins of our corporate activities, to reinforce our shared values, and then to prompt participants to think about how this impacts the way they go about their jobs. The program for newly appointed managerial personnel incorporates corporate history materials related to topics, such as globalization and diversity, which are assigned to each participant group, along with a worksheet, that they discuss in depth in relation to the distinctive character of NGK.

Education programs for other job grades are being steadily introduced, as well as programs geared towards Group companies outside Japan.

English Language Training for New Employees

Since fiscal 2011, we have been providing English language courses for all new staff members with the goal of rapidly cultivating globally capable human resources.

The one-year course is divided into classes based on student level. Besides studying the classroom materials, participants also take the initiative in their learning through activities such as creating their own class slogans.

Time spent learning English per new career-track hire
(fiscal 2020 results)

40 hours per year

Practical Overseas Training

NGK conducts practical training over a period of six months at Group companies outside Japan with the aim of developing globally minded human resources. The training focuses on developing practical business and communication skills in a cross-cultural environment targeting young employees who are future candidates for overseas postings.

Securing and Retaining Human Resources

Work Performance Evaluation

The NGK Group makes use of the following work performance evaluation when determining individual compensation.

Work performance evaluation	Ratio for target employee
Systematic use of measurable objectives (objective-oriented management) agreed upon in advance between the supervisor and subordinate	100%
Implementation of a 360° survey aimed at all key personnel (multidimensional evaluation)	21%
Grade and qualification-specific comparison and ranking of employees according to a formal process	100%

Employee Turnover Ratio

Turnover Ratio

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Turnover ratio (%) (Only full-time employees, excludes mandatory retirees)	NGK	Total	1.1	0.8	1.4	1.5	1.3
		Men	0.9	0.7	1.2	1.3	1.2
		Women	2.0	1.9	2.9	2.8	1.7

Voluntary Turnover Ratio

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Voluntary turnover ratio (%) (Only full-time employees, excludes mandatory retirees)	NGK	Total	0.8	0.8	1.2	1.5	1.2
		Men	0.7	0.6	1.0	1.3	1.1
		Women	1.7	1.7	2.5	2.6	1.6

* Voluntary turnover ratio is calculated by dividing the annual number of employees retiring of their own will by the total number of annual retirees.

Employee Engagement

Once every two years NGK carries out a survey in order to visualize workplace vitality.

For the survey carried out in fiscal 2020, a total of 4,788 people took part (men: 4,207; women: 581). When compared against the average for other companies, the responses from NGK employees regarding job satisfaction and sense of relative importance tended to be higher. Also, job satisfaction scores were higher than those from the previous survey conducted in fiscal 2018.

These survey results will be utilized as basic data for use in developing human resource measures focused on creating an organization that is more work-friendly and offers employees a sense of challenge. The workplace-specific results will also be provided as feedback to supervisors and used for workshops intended to enhance division vitality, thereby contributing to improvement in the daily workplace environment.

In the future, divisions needing to improve their scores will be visited individually and provided with organizational development support.

Results of the Survey on Workplace Vitality (%)

	FY2018		FY2020	
	Satisfaction	Employee coverage	Satisfaction	Employee coverage
Total	66	89	68	94
Men	—	—	68	95
Women	—	—	69	89

Note: Separate figures for women and men were not compiled in fiscal 2018.

Occupational Safety and Health

Basic Approach

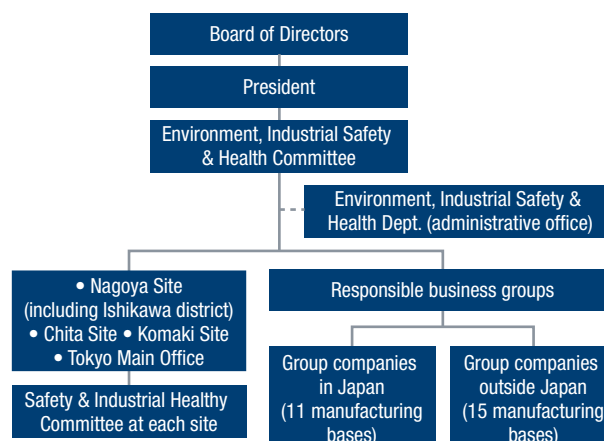
The NGK Group operates an Occupational Safety and Health Management System (OSHMS) in line with its Safety and Health Policy. The OSHMS serves as a mechanism for the ongoing, systematic achievement of employee safety and health initiatives. By strictly implementing this system and conducting risk assessment-based safety measures, we strive to raise the level of occupational safety and health throughout the entire Group.

Safety and Health Policy

Maintaining the safety and health of each employee constitutes the basis for a company's operation and existence

1. Comply with occupational safety and health laws and company regulations.
2. Engage in activities in line with the OSHMS to continuously raise the safety and health standards.
3. Promote safety and health activities under enough education and training and good communication with employees.
4. Reduce the risks of hazards and toxicity and prevent accidents to provide a comfortable work environment.
5. Prevent employees' health hazards and enhance health promoting activities.

Structure to Promote Safety and Health Management



Enhancing Safety and Health Activities

NGK views the enhancement of safety and health activities as one of its top priorities. As such, we developed a three-year action plan in fiscal 2016 built around the key themes of compliance, risk reduction, and enhanced governance and have undertaken activities based upon it. These activities have resulted in us achieving overall targets for compliance and enhanced governance. However, for risk reduction, we found that for the Group as a whole risk assessment for jobs other than routine work was insufficient. In particular, we determined it necessary to step up risk response to prevent electrocution, explosions, and employees getting caught in rotating machinery—the cause of critical disasters and major accidents.

In fiscal 2019, towards preventing critical disasters and major accidents or minimizing their damage, we formulated the second three-year action plan prioritizing the strengthening of risk management and governance systems.

In addition, we have promoted the acquisition of international occupational safety and health management system certification by all NGK sites, factories, and manufacturing-related Group companies in and outside Japan.

These safety and health efforts have earned NGK certification from the Japan Industrial Safety and Health Association (JISHA) for ISO 45001 and for JIS Q 45100, a first for Japan,. This was one of the reasons NGK received the Chairperson Prize in JISHA's 2019 Occupational Health and Safety Activity Awards.

Results of Fiscal 2020 Initiatives

Medium-Term Action Plan	Fiscal Year Implementation Items	Key Initiatives
Strengthen Risk Management	Reduce risk of workplace hazard and occupational accident that result in serious injury	We completed a reexamination of equipment/operations that present workers with potential workplace hazard and occupational accident leading to serious injury, such as being caught in rotating machinery, electrocution or explosions, and we put in place operational safeguards (e.g., organizational or administrative measures) at all production sites to control these risks. We are also largely finished with the implementation of engineering or technical measures (e.g., equipment update or remodeling), except at some overseas sites.
Strengthen Group Governance	Entrench Group Company Governance Mechanisms	In addition to safety and health-related auditing of Group companies by Safety & Health Department at the Head Office, Group company governance was strengthened in other ways, such as through internal auditing of Group companies by Business Group specialized teams responsible for overseeing them.
	Acquire Safety and Health Management System International Certification (ISO45001)	As of June 2021, safety and health management system international certification has been obtained for all production sites of Group companies in Japan and overseas.

Work-Related Fatalities

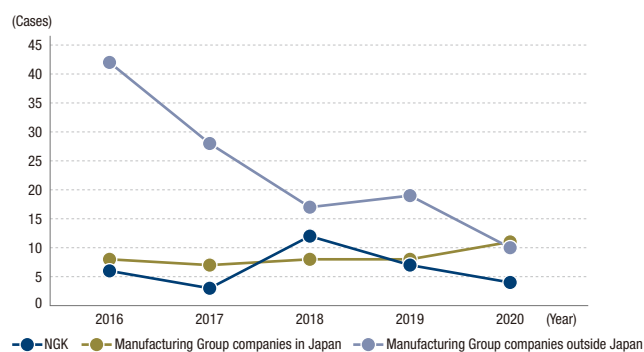
Item	Scope	2016	2017	2018	2019	2020
Number of work-related fatalities (persons)	NGK	0	0	1*	0	0
	Manufacturing Group companies in Japan	0	0	0	0	0
	Manufacturing Group companies outside Japan	0	0	0	0	0

* In 2018 there was one work-related fatality. This fatality was the result of a traffic accident involving the truck of another company, which struck an NGK employee at a pedestrian crossing on a public road.

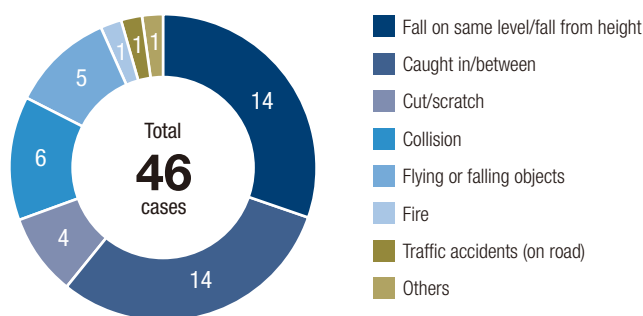
Work-Related Accidents

Item	Scope	Category	2016	2017	2018	2019	2020
Number of work-related accidents	NGK	Lost worktime accidents	3	1	4	0	1
		Non-lost worktime accidents	3	2	8	7	3
		Total	6	3	12	7	4
	Manufacturing Group companies in Japan	Lost worktime accidents	3	0	1	1	3
		Non-lost worktime accidents	5	7	7	7	8
		Total	8	7	8	8	11
	Manufacturing Group companies outside Japan	Lost worktime accidents	30	20	8	13	8
		Non-lost worktime accidents	12	8	9	6	2
		Total	42	28	17	19	10

Work-Related Accidents



Lost Worktime Accidents and Non-Lost Worktime Accidents by Type (past 7 years; NGK)



Severity Rate (Number of Lost Workdays per 1,000 Hours Worked)

Item	Scope	2016	2017	2018	2019	2020
Severity rate (Number of lost workdays per 1,000 hours worked)	Entire NGK Group	0.026	0.013	0.193	0.012	0.006
	NGK	0.004	0.000	0.743	0.000	0.002
	Manufacturing Group companies in Japan	0.009	0.000	0.000	0.005	0.003
	Manufacturing Group companies outside Japan	0.040	0.022	0.015	0.020	0.009
	All industries (Japan, sites with 1,000 or more employees)*	0.03	0.03	0.03	0.03	0.03
	Manufacturing industry (Japan, sites with 1,000 or more employees)*	0.03	0.01	0.03	0.04	0.03

* Statistics on work-related accidents from Japan's Ministry of Health, Labor, and Welfare.

Lost Time Injury Frequency (Employees)

Item	Scope	2016	2017	2018	2019	2020
Rate of lost time injury frequency (Number of lost-worktime accidents per a million hours worked)	Entire NGK Group	1.00	0.55	0.32	0.34	0.31
	NGK	0.34	0.11	0.40	0.00	0.10
	Manufacturing Group companies in Japan	0.50	0.00	0.14	0.13	0.46
	Manufacturing Group companies outside Japan	1.42	0.91	0.34	0.56	0.36
	All industries (Japan, sites with 1,000 or more employees)*	0.46	0.56	0.52	0.47	0.69
	Manufacturing industry (Japan, sites with 1,000 or more employees)*	0.24	0.25	0.29	0.26	0.28

* Statistics on work-related accidents from Japan's Ministry of Health, Labor, and Welfare.

Lost Time Injury Frequency (Contractors)

NGK Group business activities do not utilize any contractors at the manufacturing site and only a few clerical staff. Given the low risk of accidents or other mishaps, occupational injuries for contractors are also managed together with those for NGK Group employees.

Occupational Illness Frequency

Item	Scope	FY2016	FY2017	FY2018	FY2019	FY2020
Rate of occupational illness frequency (%)	NGK	0.11	0.11	0.10	0.00	0.00

External Certification on Occupational Safety and Health Management System

To continuously raise the level of occupational safety and health in workplaces, we encourage companies in the NGK Group to acquire certification for international occupational safety and health management systems.

In 2017, our Nagoya Site received the first ISO 45001 private certification in Japan. In 2018, all other NGK sites and factories in Japan received ISO 45001 certification and JIS Q 45100 certification.

In addition, as of June 2021, all 26 manufacturing related Group companies in Japan and overseas have completed the acquisition of ISO 45001.

Acquisition of Management System Certification

Item	Scope	Category	FY2018	FY2019	FY2020	June 2021
Acquisition of occupational safety and health management system certification	NGK*	ISO 45001 and JIS Q 45100	100%	100%	100%	100%
	Manufacturing Group companies in Japan (11)	ISO 45001 and JIS Q 45100	58%	100%	100%	100%
	Manufacturing Group companies outside Japan (15)	ISO 45001	40%	73%	93%	100%

Note: NGK/Nagoya Site, Chita Site, Komaki Site, Ishikawa Plant, Mitake Plant

Danger-Prediction Training Center Established

In order to reduce occupational accidents primarily caused by young workers or inexperienced workers, in 2018 we opened a 450 m² Danger-Prediction Training Center at the Chita site, where we provide safety education led by employees who have accumulated experience outside the company.

The training center is equipped with cranes, equipment simulating occupational accidents that have occurred in the company, such as being caught in rotating machinery, and machinery simulating electrocution, explosion and other occupational hazards causing serious bodily injury. In addition to training regarding general hazards, the program is designed to enhance sensitivity to danger through practical simulated situations.

Additionally, in 2020, we introduced hazard simulation VR (virtual reality) equipment, which is combined with existing hazard simulation equipment and lectures to create a new training program to further enhance workers' sensitivity to danger.



High-Visibility Vests

Although the Danger-Prediction Training Center was established to provide training that lowers the incidence of work-related accidents caused by younger or less experienced employees, this group still accounts for 40% of all accidents at NGK. In response, we made it mandatory starting in 2020 for these less experienced employees to wear high-visibility vests. This helps create a work environment conducive to accident prevention in two ways: by making the vest wearers conscious of their own inexperience, and by making it easy for other workers to see exactly who the inexperienced workers are.



Safety Process Expert Meeting (PEM)

NGK's Ceramic Products Business Group brings together overseas production site safety and health managers to its yearly Safety Process Expert Meeting (PEM) with the aim of improving safety levels across the NGK Group. In fiscal 2019, a total of over 30 employees from HONEYCERAM® production bases in and outside Japan gathered at the NGK Nagoya Site to share Group-wide activity policies and plans related to safety and health, and to exchange information about their respective companies. And with the aim of boosting risk assessment skills, all participants toured the plant to observe work processes and discuss things like potential sources of danger, successful measures, and possible improvements to be made. (Canceled in fiscal 2020 in response to the COVID-19 pandemic)

Health Management

Approach to Health Management

The NGK Group strives to promote employees' health through the NGK Group Health Declaration: "Developing dynamic, people-friendly work environments and a health-conscious corporate culture."

Health Declaration of the NGK Group

At NGK, we consider employee health and safety to be of fundamental importance to the company's operation and are, therefore, proactive about developing dynamic, people-friendly work environments and a health-conscious corporate culture, which contribute to better health for each and every employee.

- Provide a workspace that is both people-friendly and work-friendly
- Cultivate a health-conscious corporate culture for executives, employees, and their families
- Promote early detection and early intervention for health concerns
- Offer support for mental health and wellbeing

President *Shigeru Kobayashi*

Reducing Long Work Hours

In July 2016, we lowered the maximum amount of overtime work to 70 hours per month (with an upper limit of 300 hours per half-year). To this end, employees are, as a rule, not allowed to work for more than seven days straight and are not allowed to do overtime on their twice-a-week refresh days. If either of these are necessary, they must get permission from their bosses beforehand. To prevent employees from working excessively long hours, there must be an interval period of at least 10 hours between shifts of late night work.

Overtime Work Hour Trends

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Hours worked/ overtime work (Annual fixed working hours: 1,919 hours)	NGK general employees	Annual actual working hours	2,069	2,072	2,081	2,059	2,044
		Average overtime work per month	23.7	24.3	25.2	23.7	21.6
	NGK including key personnel (managers)	Annual actual working hours	2,067	2,089	2,087	2,056	2,057
		Average overtime work per month	22.9	23.4	25.2	23.6	22.0
	NGK production divisions	Annual actual working hours	2,102	2,129	2,129	2,067	2,061
		Average overtime work per month	24.7	25.7	27.3	24.4	22.8
	NGK non-production divisions	Annual actual working hours	2,051	2,077	2,050	2,052	2,037
		Average overtime work per month	22.3	22.4	24.0	23.2	21.1

Following Up on Employees Working Long Hours

NGK provides employees working long hours, including non-regular and part-time employees, with ongoing opportunities to meet with industrial physicians for health consultations and exams. The results are reported at monthly Safety and Health Committee meetings at each worksite to thoroughly promote the reduction of overtime work.

In fiscal 2019, because certain managers were often putting in long hours, Business Groups ordered this to be reduced.

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of employees having consultations	NGK	All	108	85	243	78	41

Note: Numbers of people shown are cumulative totals.

Promotion of Activities Supporting Mental and Physical Health

Four Types of Care for Mental Health

We facilitate the widespread implementation of ongoing mental and physical health promotion activities, centering on the four types of care for mental health promoted by the Ministry of Health, Labor, and Welfare (MHLW).

In fiscal 2020, we carried out stress checks for all employees and had test results analyzed by group. Based on the results of this analysis, we have a six-month program that involves training the managers of workplaces with comparatively high stress levels in improving interpersonal relations within the workplace and improving the work environment.

Four Types of Care



Percentage of Employees Taking Stress Checks

Unit: %

Item	Scope	FY2016	FY2017	FY2018	FY2019	FY2020	Target
Percentage of employees taking stress checks	NGK	91.4	93.4	94.9	95.9	94.1	100
Percentage with high stress levels		9.0	9.7	11.7	10.7	9.9	

Position-Based Mental Care Education

With an emphasis on self-care for new employees and young employees, we strive to deepen understanding of mental health by combining self-care and line care for new supervisors and managers.

We provide training for managers in areas with high occurrences of employee mental health problems with the goal of detecting and treating problems early on and putting these employees on the road to early recovery.

Position-Based Mental Care Education

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of employees taking position-based mental care education	NGK	All	1,009	402	567	614	585
		New hires	234	158	192	143	140
		General employees	325	181	306	339	362
		Managers	450	63	69	132	83

Anti-Harassment Training

Item	FY2016	FY2017	FY2018	FY2019	FY2020
Sessions held	6	5	5	5	4
Number of participants	326	350	464	419	417

Promoting Better Health and Wellbeing among Employees

In addition to annual health exams, NGK holds collaborative health promotion activities* with the health insurance association in efforts to promote better health and physical strength among employees. These activities include health lectures, health declaration challenges, the use of health apps for smartphones, physical strength measuring events, walking-age assessment events and related lectures, and recreational walks.

* An initiative in which health insurance associations work closely with companies and use their respective strengths to create a positive work environment by efficiently and effectively promoting the health and wellbeing of employees and their families.

Percentage of Employees Taking Health Exams

Item	Scope	Category	FY2016	FY2017	FY2018	FY2019	FY2020	Target
Periodic health exam	NGK	Total employees	4,035	4,266	4,683	4,936	4,967	
		Number taking health exam	3,946	4,230	4,601	4,855	4,894	
		Number of exceptions*	89	36	82	81	73	
		Health exam ratio (%)	100	100	100	100	100	

* Employees on maternity leave, temporary retirement, etc.

Percentage of Smokers

Item	Scope	FY2017	FY2018	FY2019	FY2020
Smoking ratio (%)	NGK	24.6	25.0	26.0	23.5

Percentage of Employees Taking Metabolic Syndrome Checkup

Unit: %

Item	Scope	FY2016	FY2017	FY2018	FY2019	FY2020
Percentage of employees taking metabolic syndrome checkups	NGK	84.8	86.3	86.3	87.5	Compilation results in about November 2021
Percentage with metabolic syndrome	NGK	13.2	13.1	14.3	13.2	
Percentage under medical guidance	NGK	59.1	58.6	56.7	64.6	

Number of Participants in Health Promotion Initiatives

Unit: Persons

Item	Participants	FY2017	FY2018	FY2019	FY2020
Health lectures	NGK managers	200	270	300	—
Health declaration challenges	NGK employees	1,306	1,590	1,199	1,560
Smartphone health apps	NGK employees and families	522	742	1,127	1,134
Physical dynamism checkups	NGK employees	192	191	—	—
Walking-age assessments and lectures	NGK employees	—	—	64	—
Recreational walks	NGK employees and families	223	163	223	—

Note: Items marked with a “—” were not carried out in the year in question.

Response to Infectious Diseases and Other Global Health Problems

There are approximately 450 NGK employees and family members posted overseas, and our employees in Japan take more than 3,000 overseas business trips a year, thus creating substantial risk of contracting infectious diseases. To reduce this risk, those posted overseas and taking business trips, as well as their families, are provided with health management training by industrial physicians.

Participants learn the fundamentals of infectious diseases, are advised to take immunization shots, and are taught ways to avoid contracting things like HIV and malaria.

During the influenza season from autumn to winter, employees going on overseas business trips can get influenza shots at the in-company clinic.

Outstanding Health and Productivity Management Company

Since 2019, we have been included in the “White 500” list under the Health and Productivity Management Organization Recognition Program, run by the Ministry of Economy, Trade and Industry and Nippon Kenko Kaigi.



Aichi Prefecture Advanced Health Management Company

NGK and the NGK Health Insurance Association have earned a designation as an Advanced Health Management Company by the Aichi prefectural government. The aim of this program is to recognize companies and organizations that aggressively pursue health management, in the process increasing the number of companies taking action towards a healthy workforce and increasing the healthy life expectancy of the prefecture's citizens.



Work-Life Balance

Basic Approach

NGK strives to promote a work-life balance and reduce long working hours.

We keep track of social changes, such as changing attitudes toward work as well as legislative amendments, and strive to respond to these changes flexibly and properly by improving systems and revising operations.

10 rules for promoting a work-life balance

- No more than 70 hours of overtime work per month
- Overtime work exceeding 45 hours per month limited to six months each year
- The target for annual paid leave is 10 days, and employees are obligated to take at least six days a year
- No more than 300 hours of overtime work per six months
- In principle, there will be no overtime work on refresh days (Wednesdays and Fridays)
- If overtime is necessary, a prior permit application must be submitted
- In principle, work must not be performed for more than seven days straight
- If work in excess of seven days straight is necessary, a prior permit application must be submitted
- Written applications must be submitted when requesting employees to work on holidays or late at night
- There must be an interval period of at least 10 hours between shifts of late night work

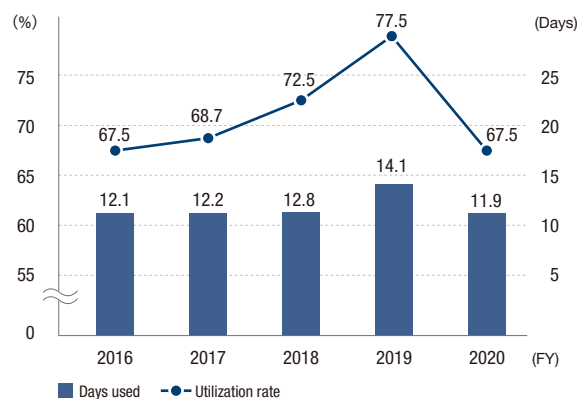
Initiatives to Limit Overtime Work

If, for any reason, overtime work in excess of 45 hours per month appears likely, the reason for the increase in overtime work must be confirmed through prior labor-management consultations to level out the time periods and workloads or increase the number of employees.

Countermeasures for Mitigating Increased Overtime Working Hours

Each year, NGK discloses statistics on hours worked and paid leave utilization to its Labor Union for discussion and countermeasure deliberation purposes. When cases of long working hours are found, Labor Union meets with each workplace to devise countermeasures. When long working hours are found for employees who have been temporarily assigned overseas, they must submit in writing the reason for the long working hours and undergo a health check. These measures are taken to maintain their health, and the written report is used to identify the reasons for long working hours and to develop countermeasures.

Paid Leave: Number of Days Used, Utilization Rate
(NGK Union Members; Excluding Outside Employees Temporarily Assigned to NGK)



Enhancing Systems for Supporting Work-Life Balance

NGK offers flexible systems to help employees maintain a balance between work and family life. To support childcare and nursing care, we are enhancing financial support by providing a babysitter expense subsidy system, and a lump-sum payment system for nursing care support. And in consideration of the working environment, we offer support via a shortened working hour system.

Further, we continue to enhance the soft infrastructure NGK has in place to support these employees. For employees seeking to balance their career with childcare, we offer pre-maternity leave interviews, pre-reinstatement interviews during the childcare leave period, career consultations, and other consultation resources. For employees undertaking nursing care, we offer nursing care-related information sessions and distribute nursing care handbooks, as well as facilitate consultation services which make use of outside resources.

Enhancement of Work-Life Balance Systems

In 2010, NGK made a major revision to its human resource system, and we have since been continuously enhancing our support measures by identifying employees' needs.

In fiscal 2017, we established an early reinstatement lump-sum system for employees who return to work early from their childcare leave (within 11 months of the start of their childcare leave). We also established a non-registered daycare subsidy system to help subsidize employees who put their children in non-registered daycares. These systems are part of the initiatives we undertake to support employees' careers after they have returned to work. Also, in addition to childcare and nursing care, we launched a system for flexible work arrangements to help employees who need to attend to a health condition of their own that requires repeated and ongoing treatment, thereby finding a balance between work and medical care.

In fiscal 2018, we investigated how to improve the efficiency and productivity of workplaces by offering employees greater flexibility in terms of work style and environment, so that they can work to their potential while maintaining a healthy work-life balance, regardless of when or where they work. It was in this context that we introduced a telecommuting system intended to help address the needs of employees with children or family members who require care, or who have a serious illness themselves.

In fiscal 2019, we made it possible for male employees to accumulate more vacation days to be used for post-maternity support. They can also take childcare leave for shorter periods. This has resulted in a more-than-60% increase in male employees taking childcare leave.

System to Support Employees to Balance Work and Childcare at Each Stage

		Interview (employee, supervisor, and HR)		Interview (employee, supervisor, and HR)	
		During pregnancy	Before/after birth	During childcare leave	Balancing work and care
Work systems		Measures on health management Overtime work exemption Late-night working hours exemption Flex time system	Time off before/after birth Special paid leave when a spouse gives birth Childcare leave (using accumulated vacation days)	Childcare leave Continuing the childcare leave Post-maternity support leave (for male employees)	Shortened working hours Flex time system Unscheduled work exemption Limitation on overtime work Late-night working hours exemption Half-day paid leave Caring for a family member (using accumulated vacation days) Caring for a child Lump-sum payment for early return
				Childcare Concierge (for those living in the Tokyo metropolitan area)	Priority use of a commuter parking lot (in Nagoya) Non-registered daycare expense subsidy
Financial support systems	Family Fund		Maternity gift		Babysitter expense subsidy Elementary school enrollment gift
	Insurance benefits		Lump-sum birth allowance		
	Employment insurance			Childcare leave benefits	
Salary			During the time off before/after birth, pay 2/3 of the standard daily wage	Unpaid	Lump-sum payment made six months after returning to work (330,000 yen)
Bonus			During the time off before/after birth, pay a bonus calculated with a 2/3 attendance rate	Unpaid	

Systems to Support Early Return from Parental Leave

NGK has systems to encourage and support employees who have taken maternity and childcare leave so that they can return to their careers at an early stage.

These systems are aimed at developing workplaces that support female employees in particular, with the expectation of promoting their active participation.

Systems to Support Early Return from Parental Leave

- A lump-sum payment for early return
- Unlicensed daycare center expense subsidy
- Childcare Concierge

Overview of Childrearing Support Measures and Users

Systems That Exceed Legal Requirements

Item	Details	Category	FY2016	FY2017	FY2018	FY2019	FY2020
Number of childcare leave takers	Until the last day of the month when the child turns 1 year old. When there are certain circumstances, such as not being able to find a daycare center, leave is available until the last day of the month in which the child turns 18 months old or the end of March after the child turns one, whichever is longer. (Legal requirement: until the child turns 18 months old)	Total	51	53	54	94	133
		Men	7	17	27	37	67
		Women	44	36	27	57	66
Shortened working hours during childrearing	6 or 7 hours per day for employees until the fiscal year when their children start 4th grade in elementary school (Legal requirement: For children under the age of 3)	Number of leave takers	57	51	63	64	62

Systems Operated Independently by NGK

Unit: Persons

System name	Details	FY2016	FY2017	FY2018	FY2019	FY2020
Lump-sum payment made 6 months after returning to work	Lump-sum payment is paid 6 months after returning to work	26	19	31	25	26
System for taking annual paid leave in hourly increments for employees working shortened hours	Paid leave (day's worth) can be taken in hourly increments by employees working shortened hours	36	36	59	62	58
Childcare leave for fathers using accumulated vacation days	Unused annual paid holidays can be used for childcare leave	7	17	19	31	54
Pre-maternity leave interview	Interview is attended by employee, HR, and supervisor to provide the employee with peace of mind while on maternity leave and ensures both sides have proper understanding of procedures related to systems supporting childcare and work	20	27	30	26	21
Interview before returning to work	Supports smooth transition back to work through consultation on work details and work style	18	30	29	27	27
System for accompanying a spouse's overseas assignment	Enables employees to take a leave of up to 2 years and 6 months while accompanying a spouse (including a non-NGK employee) posted overseas for work, and allows employees to continue their career path, which was difficult to do prior to the establishment of this system	6	9	10	9	8
Maternity gift	¥50,000 gift when a child is born	208	225	241	218	260
Babysitter expense subsidy	Provides up to ¥100,000 per year for employees who must pay for a babysitter or daycare due to working hours	19	9	8	11	31
Childcare Concierge	Support to facilitate the process of putting a child in daycare and returning to work	2	1	1	1	0
Priority parking spaces to support childcare	Priority parking spaces available at a commuter parking lot	19	29	32	40	40
Non-registered daycare subsidy system		Unintroduced	1	0	0	0
Lump-sum payment for early return		Unintroduced	3	7	5	3

Systems to Support Nursing Care

Working hours	Time off	Financial support
<ul style="list-style-type: none"> ① Shortened working hours ② Working 3 days a week ③ Flex time system (for employees at departments to which the regular flex time system does not apply) ④ Limitation on overtime work ⑤ Unscheduled work exemption ⑥ Late-night working hours exemption 	<ul style="list-style-type: none"> ⑦ Caring for a family member using accumulated vacation days ⑧ Unpaid days off to provide care <div> <div>Leave of absence</div> <ul style="list-style-type: none"> ⑨ Care leave </div>	<ul style="list-style-type: none"> ⑩ Care leave benefits ⑪ Care leave support fund ⑫ Lump-sum care allowance

Nursing Care Leave Usage (NGK)

Category	FY2016	FY2017	FY2018	FY2019	FY2020
Total	0	1	1	1	1
Men	0	1	0	1	0
Women	0	0	1	0	1

Note: Includes contract employees.

Revision of the Care Leave System

In line with revisions made in January 2017 to the Child Care and Family Care Leave Act, we made revisions to our own system, such as enabling employees to divide their one-year nursing care leave into three blocks.

Moreover, we have signed a corporate contract with SeaCare, an NPO that supports care-giving, to further enhance services helpful to caregivers. This service makes care-giving consultations available free of charge, regardless of whether Certification of Needed Long-Term Care has been obtained, and enables employees to receive support in care-giving when they are unable to do so.

Company Intranet

We have a site on diverse work styles on the company intranet to widely announce our measures to support a work-life balance. This site's user-friendly features include, for example, an online handbook on childcare and nursing care.



Social Contribution Activities

The NGK Group is concerned about social issues in all nations and regions. We engage in social contribution activities in response to needs in each region in an aim to become a corporate citizen trusted by local communities.

Basic Approach

The NGK Group promotes social contribution activities based on the following concepts.

Focus of Activities

Centered on people and education, the environment, and community involvement.

Company Activities and Employee Involvement

- NGK provides employees with opportunities to experience activities.
- NGK proactively encourages individual activities to engender employee satisfaction and a sense of confidence in the company.

Information Disclosure

NGK promotes an understanding of activities and provides activity information to inculcate a social contribution mindset among employees.

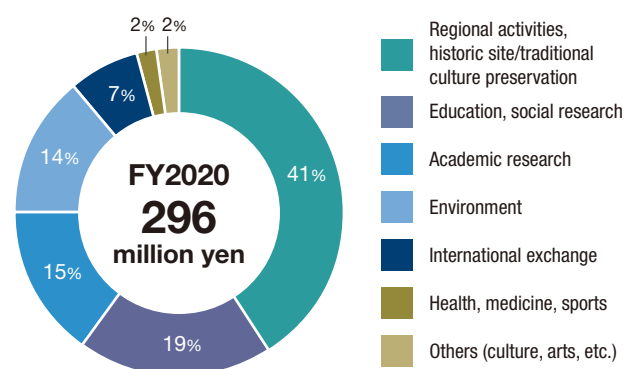
The NGK Group's social contribution activities are promoted by the General Affairs Department under the leadership of the ESG Committee.

NGK collects reports from Group companies in and outside Japan on their activities. In fiscal 2020, a total of 50 reports were received.

Social Contribution Activity Promotion Status

	FY2016	FY2017	FY2018	FY2019	FY2020
Social contribution expenditures	315 million yen	300 million yen	302 million yen	237 million yen	296 million yen
Number of social contribution programs	10	10	10	13	10
Number of collaborations with NPOs/NGOs	4	4	4	4	4

Breakdown of Activities



Social Contribution Activities by NGK

Providing Scholarships and Assistance to International Students

NGK established the NGK Foundation for International Students in order to facilitate the cultivation of individuals who will contribute to the development of the international community. It is through the Foundation that NGK is helping to provide housing and scholarships to overseas students visiting Japan.

The impetus for the Foundation's establishment stems from gratitude for the warm community support and hospitality shown to NGK's first employees and families posted overseas at the time of its initial overseas expansion back in the 1930s. Our activities are conducted in the hope that the students will feel glad that they came to Japan and develop a fondness for the country.

In fiscal 2020, we provided housing to 39 students from five countries, and scholarships (non-repayable) to 20 students from 10 countries.



Reference
URL

The NGK Foundation for International Students

<https://www.ngk-insulators.com/en/sustainability/philanthropy/>

Exchange between Supported Students, Communities, and Employees

NGK organizes a variety of events and programs to provide opportunities for grassroots international relations between supported students, regional communities, and employees. Language classes taught by international students have been held annually since 2000, and cross-cultural exchange meetings where international students introduce their native countries have been held annually since 2006. As of fiscal 2019, around 1,000 people have participated and, although these events were canceled in fiscal 2020 in response to the COVID-19 pandemic, we are discussing restarting them in the future based on the pandemic situation.

Communication after Support Ends

To maintain relationships with international students after support ends, each year, we send out a New Year's greeting card that includes a company status report to former and current students.

We also distribute NGK International Friendship Club Members Cards that include our contact information to international students after support ends.

In fiscal 2020, we sent New Year's cards with updates on the Foundation and NGK to around 300 students who have received support in the past.

Support for Wheelchair Tennis

Since 2020, as part of our support for persons with disabilities and local sports, NGK has been an active supporter of wheelchair tennis.

We assist talented wheelchair tennis athletes based in Aichi Prefecture in various ways, such as helping to fund their travel inside Japan and overseas. We have also established a new hard court as well as barrier-free outdoor restrooms at the NGK Group company-operated Moronoki Tennis Club (located in Midori-ku in Nagoya City), which is open to wheelchair tennis athletes and aficionados alike.

NGK has also signed an official partnership agreement with the Japan Wheelchair Tennis Association (JWTA), with whom we work to sponsor annual events, competitions, and other opportunities for expanding and developing the sport of wheelchair tennis.



NGK Science Site Offers Special Content for Kids to Try at Home

The “NGK Science Site: Experiments at Home Series” featured on the NGK website piques children’s interest in science by presenting them with simple experiments, which they can perform using everyday items. This approach has attracted many to the site since its launch in 1997.

In 2020, a special page was added to the NGK Science Site, which features simple experiments and craft projects that children can create using items from around their house. While at home during efforts to stop the spread of COVID-19, these experiments and crafts help children to enjoyably pass the time, as there is no need to go shopping for any of these projects.

Using experiments from the NGK Science Site, a series of videos titled “120 Seconds of Science” was created. This video series won two awards: an award of excellence in the education category of the 62nd Science and Technology Film/Video Festival; and the Director’s Award from the Tsukuba Expo ‘85 Memorial Foundation.



Reference URL NGK Science Site
<https://site.ngk.co.jp/>

Using the Employee Cafeteria for the Table for Two Program

NGK has participated in the Table for Two program since September 2010, using it as a casual, daily volunteer activity, which employees can easily be a part of. Under this program, whenever an employee eats something off of the cafeteria’s healthy menu, an amount equivalent to one school lunch (20 yen) goes to children in Africa. All employee cafeterias at our Nagoya, Chita, and Komaki sites, as well as at our Ishikawa Plant, participate.

In fiscal 2020, we provided 51,000 school lunches (1.02 million yen from employee lunches and matching funds from NGK) and received the Platinum Supporter Award from the Table for Two organizers. Our total contributions up to this point are 440,000 school lunches (approximately 8.8 million yen), which is roughly equivalent to one year’s worth of school lunches for around 2,200 African children.



Volunteer Group Participation in the “Marathon Festival Nagoya, Aichi 2021”

A group of volunteers from the NGK Group took part in the “Marathon Festival Nagoya, Aichi 2021”. This is an ongoing volunteer activity of the NGK Group, and fiscal 2020 marked the sixth time that we have participated.

Similar to fiscal 2019, because of the COVID-19 pandemic, the scale of the event in fiscal 2020 was reduced, limiting the number of volunteers who could take part. A total of 25 employees from Nagoya, the Chita and Komaki Sites, the Ishikawa Plant, as well as NGK Ceramic Device, NGK Yu-Service, and other Group companies, took part handing out water to runners and helping with event operations.



Participation in Coastal Forest Restoration Project

NGK employees took part in OISCA International’s 10-year Coastal Forest Restoration Project being carried out along the coast of Natori in Miyagi Prefecture as part of the rebuilding efforts following the 2011 Great East Japan Earthquake.

A combined total of 50 volunteers performed weeding, which will protect the growth of the coastal Japanese black pines. They spent four hours pruning away wild soybean vines from around roughly 1,500 black pines, as well as checking on the condition of around 35,000 black pines in total.



Social Contribution Activities by Group Companies

NGK Electronics Devices Holds Blood Drive

NGK Electronics Devices held a blood drive at its head office in Mine City, Yamaguchi Prefecture.

Ten employees participated in this blood drive, which is held annually in response to, and in conjunction with, the Japanese Red Cross Society and the Mine City Government. Because of the growing COVID-19 pandemic, additional hygienic control measures were carefully implemented, including checking people's temperature at the entrance, requiring hand disinfection and mask-wearing, and constant air ventilation inside the mobile blood bank van.



NGK Electronics Devices Promotes Traffic Safety

In advance of the Yamaguchi Traffic Safety Association's summer traffic safety campaign run between July 11 and 21, NGK Electronics Devices conducted its own safety awareness promotion at its head office.

Ten members of the Traffic Safety Committee stood outside during normal morning commuting hours and handed out traffic accident prevention fliers and called on employees to be mindful of traffic safety.



NGK Electronics Devices Promotes Communication Accessibility

Members of the NGK Electronics Devices (NGKED) Qup (Quality-up) Steering Committee stood out front at the company's head office and Amagasaki Site to greet and talk with employees. This is a regular activity carried out by NGKED, which uses active engagement in order to facilitate better communication among employees.

As part of this activity, nine Qup Steering Committee members stood in front of the head office, while three stood in front of the Amagasaki Site, during normal morning commuting hours to personally greet and talk with employees.



NGK Electronics Devices Helps with Mine Lantern Night Week

Employees from NGK Electronics Devices (NGKED) participated as volunteers in "Mine Lantern Night Week" put on in the city of Mine.

For three years running, NGKED employees have participated as volunteers in the festival's lantern display event held throughout the city, which showcases more than 1,000 lanterns from the city of Taipei in Taiwan, with which Mine City has an exchange relationship. Due to the COVID-19 pandemic, the festival stalls and events were canceled in fiscal 2020, but the lantern display was held as usual. For one month before the festival, NGKED employees worked after hours, on weekends, and during their other free time to create lanterns, such as an "amabie" lantern constructed by city employees and volunteers as a prayer for an end to the pandemic, which they displayed in front of city hall and inside Mine Station.



NGK Ceramic Device Holds Blood Drive

NGK Ceramic Device held a blood drive at its Tsuru Plant.

When contacted by the Yamanashi Prefecture Red Cross Blood Center about donating blood to help alleviate shortages due to the impact of the COVID-19 pandemic, 31 employees responded, which was the largest number in the past 10 years. In order to avoid any of the '3 Cs (closed spaces, crowded places, and close-contact settings),' the blood drive was extended for roughly an hour longer than usual.



NGK Ceramic Device Receives Letter of Appreciation from Tajimi City

The NGK Ceramic Device (NCDK) Tajimi Plant was recognized by Tajimi City for its contributions to civic vitality. The NCDK Tajimi Plant donated 1 million yen to Tajimi City as part of the plant's operations launch ceremony in 2019. In recognition of its contribution, the city presented the plant with its commendation.

The NCDK Tajimi Plant manager attended a ceremony held in the city to celebrate the 80th anniversary of Tajimi City's establishment. A commendation ceremony was held as part of this, during which Tajimi Mayor Masanori Furukawa presented letters of appreciation to those being recognized for distinguished service.



NGK and the NGK Ceramic Device Ishikawa Plant Hold a Blood Drive

NGK and the NGK Ceramic Device (NCDK) Ishikawa Plant held a blood drive.

This blood drive is held annually at the request of the Ishikawa Prefecture Red Cross Blood Center. A combined total of around 50 employees from both plants stepped up to donate blood in response to a shortage at the Blood Center as a result of the impact of the COVID-19 pandemic.



NGK Ceramics Europe Receives Letter of Appreciation from Local Medical Institutions

NGK Ceramics Europe (ACE) received a letter of appreciation from local medical institutions in response to its donation of 8,000 masks.

During the spread of the COVID-19 pandemic in Belgium, ACE received a request for help from the local government of Baudour, to which it responded in March by donating a supply of 8,000 masks. This donation, which came at a time when the city's mask supply was virtually empty, helped to prevent a collapse in primary health care, and was honored by the city with a letter of appreciation.



NGK Metals Employees Donate Food

Food donations were offered by 32 employees from NGK Metals in order to help those struggling due to the economic slump caused by the COVID-19 pandemic. The donated food items were delivered to local aid groups and facilities via a food bank in Sweetwater, Tennessee, where NGK Metals is located.



NGK Electronics Devices Malaysia Implements EHS Activity Month

NGK Electronics Devices Malaysia (NGKMY; located in Penang) implemented "EHS Activity Month" all throughout September.

EHS activities are regular awareness-raising activities designed to increase environmental, health, and safety awareness amongst employees.

The activities commenced on September 3 with all employees being provided with a spoon and fork set, bread for breakfast, and other items intended to help combat COVID-19 pandemic. During the activity period, free eyesight tests, cervix cancer screenings, filariasis blood tests, and other medical examinations were offered to employees in order to encourage them to take more of an interest in their health. Other activities held during the month included awareness-raising posters set up in special areas, an EHS activity logo contest, and an environment, health, and safety-themed treasure hunt. Collectively, these activities served as a fun and effective means of raising awareness among all employees about the importance of EHS.

NGKMY has regularly held blood drives, clean-up events, tree plantings, and other activities, as well as hosted health seminars.



Governance

Corporate Governance	94
Communication with Shareholders	109
Materiality	112
Risk Management	113
Business Code of Conduct	119
Customer Relationship Management	128
Impact on Policy	129
Supply Chain Management	130
Information Security	134
Innovation Management	136
Emerging Markets Strategy	137

Corporate Governance

Basic Policies

To ensure appropriate operations and transparent management, the NGK has set its sights on establishing and maintaining an organization capable of swiftly responding to changes in the business environment, and a fair and open management system emphasizing the interests of shareholders. These components make up NGK's basic approach to corporate governance.

To put this approach into practice, NGK has chosen a corporate governance system anchored by an Audit & Supervisory Board. In addition to the General Meeting of Shareholders, the Board of Directors, and the Audit & Supervisory Board, NGK corporate governance includes the Executive Committee and several other committees established to assist the president in management decision-making. These bodies help to enhance governance efficacy by deliberating and reviewing important matters.

In recognition of needs to execute swift and optimal decision-making and respond promptly to changes in the operating environment, NGK introduced an executive officer system, thus separating the management decision-making and supervision functions from business execution functions, and clearly defining the responsibilities of both.

Furthermore, to strengthen the supervision and monitoring functions of the Board of Directors, major committees among those tasked with mitigating the various risks surrounding NGK are obligated to report to the Board of Directors. NGK has also established a committee scheme, including a Nomination and Compensation Advisory Committee, a Corporate Council, a Conference of Outside Directors and Outside Audit & Supervisory Board Members, and a Business Ethics Committee to ensure the effectiveness of the Corporate Governance Code.

In addition, we have formulated the 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 the company'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. To reflect changes in society since the previous revision, in January 2019 the NGK Group Code of Conduct was revised with an emphasis on respect for human rights, thorough compliance, and the realization of a sustainable society through business activities.

Reference
URL

Corporate Governance Report

https://www.ngk-insulators.com/en/resource/pdf/sustainability/governance_en.pdf

Corporate Governance Enhancement

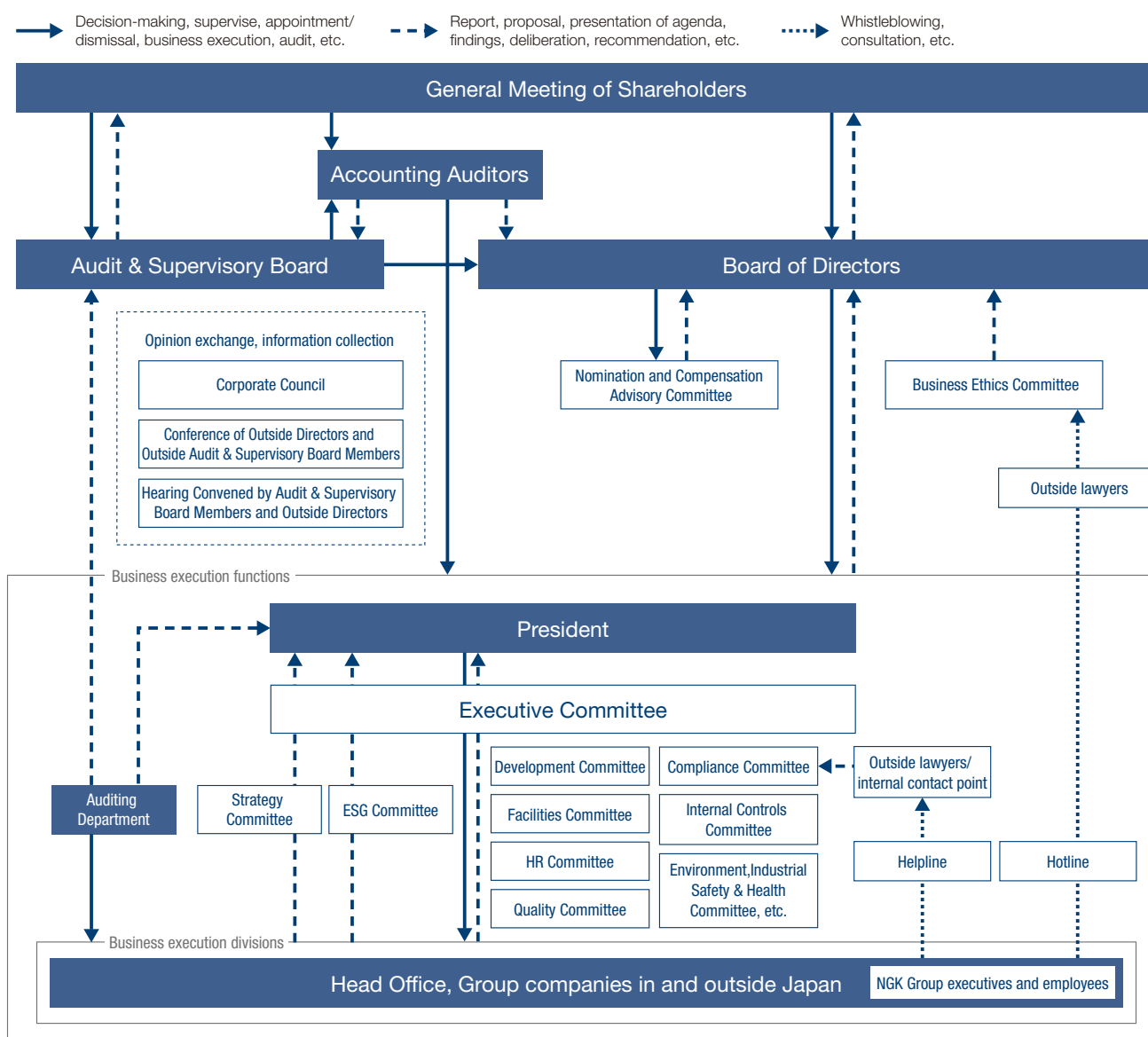
Ongoing structural enhancements aimed at strengthening corporate governance include the introduction of an executive officer system and an outside director system to improve the management supervision and monitoring functions and facilitate recommendations with respect to overall management.

April 1999	Established the NGK Code of Conduct
April 2003	Revised guidelines into the NGK Group Code of Conduct
June 2005	Introduced an executive officer system
	Introduced a stock option
	Introduced an outside director system
July 2005	Established the CSR Committee
April 2007	Established the CSR Office
June 2010	Appointed independent directors
July 2011	Revised the NGK Group Code of Conduct
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 Code of Conduct
April 2019	Established the ESG Committee
February 2020	Endorsement of recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)
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
	Established the ESG Management Department
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

Corporate Governance System

To ensure lawful business activities and management transparency, respond quickly to changes in the management environment, and create and maintain a fair management system from the shareholder's perspective, NGK has created the following systems. In April 2019, we established the ESG Committee, chaired by the president, to promote comprehensive discussion on key issues, strategies, and action plans related to the environment, society, and governance. In fiscal 2020, the ESG Committee met seven times during which it examined a variety of important matters, including long-term environmental response-related planning; the state of environmental, quality, safety and health-related committee activity; ascertainment of serious risks and handling of disclosure; and the status of social contribution activities.



Committees on Corporate Governance

NGK has further strengthened and enhanced its corporate governance system by establishing committees to bolster the supervision and monitoring functions of the Board of Directors.

Board of Directors

The Board of Directors is composed of nine directors (eight male, one female; one third of directors are outside directors). It discusses matters designated under the Companies Act, NGK's Articles of Incorporation and Board of Directors' Regulations. (These matters include company-wide unified budgeting, strategic planning such as dissolution, mergers, and alliances of the company, appointing and removing representative directors, business reports, approval of financial statements etc., the disposal and acceptance of transfer of important assets, the appointment and dismissal of important employees, etc.) 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 input and opinions when necessary.

Times held: 14

Audit & Supervisory Board

The Audit & Supervisory Board is composed of four Audit & Supervisory Board Members (all male). Audit & Supervisory Board Members audit directors' decision-making process and execution of duties, 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 confirm the status and operation of so-called internal control systems, and confirm the appropriateness of accounting auditors' auditing methods and results.

Times held: 14

Executive Committee

The Executive Committee is a body that deliberates necessary matters to assist the President in decision making, and consists of the President, Executive Vice Presidents, Group Executives of each Business Group, Group Executive of Corporate R&D, Group Executive of Corporate Manufacturing Engineering, corporate officers in charge of each division, senior fellows, Standing Audit & Supervisory Board Members, as well as corporate officers, chairpersons, general managers and division heads designated by the President, of which 16 are male and one is female.

Times held: 19

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 remuneration, and other matters. The Nomination and Compensation Advisory Committee deliberates on personnel matters for directors and the Audit & Supervisory Board Members, matters relating to remuneration for directors and corporate officers, total remuneration amount proposal for the Audit & Supervisory Board Members, and a succession plan for the chief executive, and reports its results to the Board of Directors. The majority of the Nomination and Compensation Advisory Committee was previously composed of outside directors and Outside Audit & Supervisory Board Members and chaired by a representative director. However, its composition was revised at the meeting of the Board of Directors held on June 28, 2021 so that its majority is composed of independent outside directors, and an independent outside director was elected as Chairperson. The Nomination and Compensation Advisory Committee is composed of four male members and one female member.

Times held: 4

Business Ethics Committee

The Committee, comprised of outside directors/audit & supervisory board members and one inside director in charge of compliance, conducts investigations as necessary into fraudulent acts or violations of laws and regulations in which the officers and others of NGK were involved and makes recommendations on measures to prevent reoccurrence, etc. to the Board of Directors, in addition to considering the creation of compliance systems and compliance activities aimed at compliance with competition laws and the Foreign Corrupt Practices Act, and reporting the results thereof to the Board of Directors. The Committee strives to strengthen the compliance system by establishing, in addition to the current Helpline System, a whistle-blowing system (hotline), which is directly linked to the Business Ethics Committee, as a mechanism to prevent any such fraudulent act or violation of laws and regulations. The Business Ethics Committee is composed of five male members and one female member.

Times held: 6

► P122 Whistleblowing System (Hotline)

Corporate Council

The Corporate Council is a council where outside directors/Audit & Supervisory Board Members, representative directors, and other participants exchange opinions, and an opportunity where management seeks for advice from the outside directors/Audit & Supervisory Board Members concerning various issues on management. The Corporate Council is composed of nine male members and one female member.

Times held: 1

Conference of Outside Directors and Outside Audit & Supervisory Board Members

The Conference of Outside Directors and Outside Audit & Supervisory Board Members consists solely of outside directors/Audit & Supervisory Board Members, and exchanges opinions concerning managerial issues and other matters aiming to actively contribute to discussions at the Board of Directors' meetings. The Conference of Outside Directors and Outside Audit & Supervisory Board Members is composed of four male members and one female member.

Times held: 1

Hearing Convened by Audit & Supervisory Board Members and Outside Directors

Comprised of Audit & Supervisory Board members and outside directors, information is collected from internal persons regarding the business environment and issues of NGK. It is composed of six male members and one female member.

Times held: 12

Note: Times held is the number of meetings between April 2020 and March 31, 2021.

Other Bodies

Quality Committee Times held: 5	<p>Aiming to increase customer satisfaction and trust by realizing even higher-quality products and services, this body deliberates the matters necessary to help the president and the Quality Committee chair with decision-making regarding the following items.</p> <ol style="list-style-type: none"> 1. Determination, revision, or abolition of Quality Policy and Objectives 2. Items pertaining to the prevention of serious quality defects in the market and technological responses after occurrence 3. Other quality-related matters determined to be important
Environmental Protection Committee Times held: 3	<p>This body formulates and deliberates the planning of matters necessary to help the president and the Environmental Protection Committee chair with decision-making regarding the realization of our Core Policy on the Environment to promote business activities in harmony with the environment.</p>
Safety and Health Committee Times held: 2	<p>This body deliberates important issues on safety and health to assist the decision-making of the president and Safety and Health Committee chair regarding the establishment of basic policies and priority targets pertaining to safety and health and the confirmation of labor accidents and priority activities.</p>
Compliance Committee Times held: 3	<p>This body assists the president and Compliance Committee chair with decision-making by deliberating essential matters pertaining to the following.</p> <ol style="list-style-type: none"> (1) Observance of laws, regulations, and corporate ethics <ol style="list-style-type: none"> 1. Determination, revision, or abolition of basic policies related to the observance of laws, regulations, and corporate ethics, including the Code of Conduct Note: Deliberation items for Board of Directors meetings 2. Determination of systems, structures, and strict observance of important activities pertaining to laws, regulations, and corporate ethics company-wide 3. Handling of Helpline matters 4. Determination, revision, or abolition of risk management structures pertaining to laws, regulations, and corporate ethics (2) Response to the matters, incidents, or accidents related to laws, regulations, and corporate ethics that are special crisis management matters (3) Other compliance-related issues deemed important by the committee chair
Internal Controls Committee Times held: 3	<p>This body deliberates matters necessary to help the president and Internal Controls Committee chair with decision-making regarding internal controls system assessment and reporting related to financial reporting based on the Financial Instruments and Exchange Act.</p> <ol style="list-style-type: none"> 1. Determines the scope of reporting for each fiscal year, assessment and reporting schedules, standards to assess internal controls, and other basic matters 2. Summarizes internal controls assessment and drafts internal controls report
Development Committee Times held: 3	<p>This body deliberates items necessary to assist the decision-making of the president and Development Committee chair regarding policies, evaluations, budgets, major individual planning, and commercialization projects related to development.</p>

Facilities Committee Times held: 8	This body deliberates items necessary to assist the decision-making of the president and Facilities Committee chair regarding the examination and evaluation of policies, budgets, performance, and major individual planning related to capital expenditure and information systems.
HR Committee (established in April 2020) Times held: 4	<p>This body assists the president with decision-making by examining issue presentation, research reporting, solution development, and other essential matters related to corporate obligations in respecting human rights (issue handling) and the important personnel policies within the NGK Group.</p> <ol style="list-style-type: none"> 1. Matters related to the determination, revision, or abolition of basic human rights policies 2. Matters related to raising human rights awareness among all Group companies and implementing human rights due diligence 3. Matters related to important personnel policies whose impact may potentially extend to Group companies 4. Other human rights and personnel policy-related matters deemed serious by the committee chair
ESG Committee Times held: 7	This body facilitates information sharing, opinion exchange, and policy deliberation between the president and other relevant directors and personnel about important environmental, social, and governance-related issues.
BCP Countermeasures Headquarters Times held: 1	Aimed at ensuring business continuity in times of emergency, this body executes the operation and maintenance of business continuity plans (BCP) in normal times as well as gives instructions on and support to restoration systems, and prioritizes restoration orders when BCP is in effect.
Central Disaster Prevention and Control Headquarters Times held: 1	This body executes requisite duties under commands from the Head and deliberates items necessary to assist the decision-making of the president and Head of this body regarding items related to earthquakes, storm and flood damage, fires, and explosions that threaten or significantly impact the company.
Security Export Control/ Specified Export and Customs Clearance Control Committee Times held: 1	This body deliberates and determines items necessary for guidance for subsidiaries and affiliates, legal compliance and the improvement of other internal systems with respect to security export controls, specified export declaration systems, and the management of customs clearance operations.

Auditing Status

Audit & Supervisory Board Auditing Status

Each Audit & Supervisory Board member is responsible for providing an independent perspective on the job performance of directors and accounting auditors, as well as for sharing information with the other Audit & Supervisory Board members in order to help ensure auditing is both efficient and highly effective. In addition to meeting before and after the Board of Directors meeting each month, the Audit & Supervisory Board convenes meetings on an as-needed basis. In fiscal 2020, the Audit & Supervisory Board met 14 times for an average of 1.5 hours each time.

The following four items were addressed as auditing priorities in fiscal 2020.

- (1) The status of the risk management response system and preparedness for future change
- (2) The status of ESG-related initiative adoption
- (3) The launch/progress status of new business, business restructuring, etc.
- (4) Business-specific risk awareness and reasonableness of the management decision-making process

Audit & Supervisory Board members attend Board of Director meetings where they observe meeting management, resolution content, and other aspects, and provide opinions and input as necessary. In addition, hearings convened by Audit & Supervisory Board members and outside directors are held with each general manager and Head Office division director to learn and exchange opinions about various matters, including budgetary content, the status of business, the status of risk management, and legal and regulatory compliance systems. Also, on-site auditing visits and other methods are used when necessary to hold hearings with directors and other managers, as well as directors and personnel at subsidiaries, to learn and exchange opinions about such matters as the status of business, risk management, and legal and regulatory compliance systems.

In addition to the above, full-time Audit & Supervisory Board members also attend meetings of the Executive Committee, Compliance Committee, Internal Controls Committee, and other important meetings and committees within NGK in order to assess the business execution decision-making process, the management situation, and other matters. They also meet every half-term with the representative directors to share the results of their audits and to exchange opinions. For the corporate group audit, overseas subsidiaries selected based on importance and risk approach considerations underwent audits conducted remotely using a Web-conferencing system; in addition to biannual online meetings with auditors at major NGK Group subsidiaries in Japan, two online audit report meetings were held with auditors, inspectors, and other auditing-related personnel from NGK Group subsidiaries in Japan, China, and South Korea.

Other activities undertaken by the board members included reviewing important approval documents and the results of internal reviews conducted by the Auditing Department; soliciting comments and critiques about financial report-related internal reporting audits conducted by accounting auditors; and reviewing the Group's asset status by accompanying accounting auditors on in-person, physical inventory inspections of inventory assets. The details of the auditing activities undertaken by the full-time Audit & Supervisory Board members are shared in a timely manner with the board's outside members via board meetings and other means.

Internal Audits

As an internal audit division, NGK has established the Auditing Department (15 members) which conducts audits of the status of business execution at each operating division and provides representative directors with information that contributes to corporate decision-making. The general manager of the Auditing Department is a member of the Internal Controls Committee. Internal audits are conducted independently of audits by Audit & Supervisory Board Members and the accounting auditors, but the Auditing Department regularly exchanges information with the Audit & Supervisory Board (Members) and the accounting auditors regarding audit policy, plans, results, etc., in order to increase the effectiveness and efficiency of audits. In addition, because specialized knowledge is required for audits in areas including quality, environment, safety and health, the dedicated secretariats of the committees responsible for each area engage in internal Group audits where necessary. The results of these audits are reported by each committee, and a summary reported to the Board of Directors.

Accounting Audit Status

Accounting audits are performed by an auditing firm and includes financial statement and internal control auditing carried out in line with the Financial Instruments and Exchange Act and auditing carried out in line with the Companies Act.

Selection of the auditing firm to perform accounting audits was carried out by the Audit & Supervisory Board according to a variety of criteria. Among the key criteria were whether the firm maintained systems and structures in line with the Regulation on Corporate Accounting ("Matters Related to the Performance of Duties of Financial Auditor(s)"); whether it possessed professional expertise and could carry out appropriate auditing while maintaining a position of independence; and whether there was any grounds for dismissal of financial auditors, as per the Companies Act. Based on a determination of suitability made in light of these criteria, Deloitte Touche Tohmatsu LLC ("Deloitte") has been selected as the accounting auditor for NGK.

The decision of the Audit & Supervisory Board and its members to utilize Deloitte as the accounting auditor for NGK was made based not only on the company's suitability in terms of the mentioned selection criteria but also in light of such criteria as its communication with management, Audit & Supervisory Board members, finance and accounting divisions, internal auditing divisions, and others during the course of daily auditing and other activities, and its suitability for handling Group-wide auditing and improper and illegal risks.

Board of Directors, Audit & Supervisory Board, Executive Officers

Board of Directors (as of June 30, 2021)



Taku Oshima
Chairman

Number of shares of the Company held
10,000

Attendance at Board of Directors meetings
100% (14/14)

Years in office: 7

March 1980 Joins NGK
June 2007 Appointed as vice president
June 2011 Appointed as senior vice president
June 2014 Appointed as representative director and president
April 2021 Appointed as representative director and chairman (incumbent)

Reasons for Appointment

Mr. Taku Oshima belonged to Manufacturing Engineering Division, and experienced the start-up of manufacturing lines at overseas subsidiaries. In addition, he engaged in the development and mass-production of NAS batteries from the beginning, working on design, manufacturing, and marketing as Head of the NAS battery business, the world's first large-scale energy storage system. He served as Representative Director and President from 2014, and has been serving as Representative Director and Chairman since April 2021 and has abundant experience at the Company and insights into business operations. It is on this basis that he has been appointed.



Shigeru Kobayashi
President

Number of shares of the Company held
10,126

Attendance at Board of Directors meetings
100% (11/11)
Note: Attendance relates to the Board of Directors meetings held since he assumed the position of Director on June 29, 2020.

Years in office: 1

March 1983 Joins NGK
June 2016 Appointed as vice president
June 2018 Appointed as senior vice president
June 2020 Appointed as director and senior vice president
April 2021 Appointed as representative director and president (incumbent)

Reasons for Appointment

Mr. Shigeru Kobayashi engaged in overseas sales and marketing at Energy Infrastructure Business Division and assumed positions in various departments including the manager of sales and marketing department of the NAS battery business, president of an overseas subsidiary, manager of the overseas sales and marketing department at Ceramic Products Business Group, and Group Executive of Energy Infrastructure Business Group. He has been serving as Representative Director and President since April 2021. He has an ample experience at the Company, as well as a wealth of knowledge and personal contacts for business operations. It is on this basis that he has been appointed.



Hiroshi Kanie
Executive Vice President

Number of shares of the Company held
10,000

Attendance at Board of Directors meetings
100% (14/14)

Years in office: 7

March 1981 Joins NGK
June 2010 Appointed as vice president
June 2012 Appointed as senior vice president
June 2014 Appointed as director and senior vice president
June 2018 Appointed as representative director and executive vice president (incumbent)

Responsible for Auditing Dept., Corporate Planning Office, New Business Planning Dept., Human Resources Management Dept., Group Compliance Dept., Legal Dept., Intellectual Property Dept., and General Affairs Dept.; Senior Officer in charge of Group Companies; Chief Compliance Officer; Chair of Compliance Committee and Internal Controls Committee

Reasons for Appointment

Mr. Hiroshi Kanie has gained a variety of practical experience in business operations and department management, by working in Industrial Process Division and serving as General Manager of Secretarial Office, Head Office, and Group Executive of Ceramic Products Business Group. He has been serving as Representative Director and Executive Vice President since 2018, and currently is responsible for Human Resources Management Department, Corporate Planning Office, Legal Department, and Auditing Department in Head Office. He has an ample experience at the Company and knowledge in business operations, therefore, and it is on this basis that he has been appointed.



Chiaki Niwa
Executive Vice President

Number of shares of the Company held
10,000

Attendance at Board of Directors meetings
100% (14/14)

Years in office: 6

March 1984 Joins NGK
June 2013 Appointed as vice president
June 2015 Appointed as director and vice president
June 2016 Appointed as director and senior vice president
June 2020 Appointed as representative director and executive vice president (incumbent)

Responsible for Corporate R&D, Corporate Manufacturing Engineering, Quality Management Dept., Environment, Industrial Safety & Health Dept., and Digital Transformation and Innovation Dept.; Chair of Quality Committee, Environment, Safety and Industrial Health Committee

Reasons for Appointment

After his long engagement in engineering business division (currently, an independent company) and plant technology division in Industrial Process Division, Mr. Chiaki Niwa has been serving as representative director and executive vice president since 2020. He currently controls quality management, environmental management, safety and health management, and DX Promotion departments in Head Office, takes responsibility for Corporate Manufacturing Engineering Group, and plays a role of promoting new/reformed manufacturing structures as a whole. He has an ample experience at the Company, as well as deep knowledge in project management and manufacturing technology, therefore, and it is on this basis that he has been appointed.

Note: Number of shares of the Company held is current as of June 30, 2021.



Ryohei Iwasaki

Director and Senior Vice President

Number of shares of the Company held
10,000

Attendance at Board of Directors meetings
100% (14/14)

Years in office: 12

March 1982 Joins NGK
June 2008 Appointed as vice president
June 2009 Appointed as director and vice president
June 2012 Appointed as director and senior vice president (incumbent)

Group Executive, Process Technology Business Group; in charge of management affairs

Reasons for Appointment

Mr. Ryohei Iwasaki has accumulated a variety of practical experience in business operations including engagement in sales and marketing in Ceramic Products Business Group followed by overseas subsidiaries' president, as well as such positions as General Manager of Corporate Planning Office and Group Executive of Electronics Business Group and in management of Head Office. He currently serves as Director and Senior Vice President, and Group Executive of Process Technology Business Group, leading the operation thereof. He has an ample experience at the Company and knowledge in business operations, and it is on this basis that he has been appointed.



Hideaki Shindo

Director and Senior Vice President

Number of shares of the Company held
5,000

Attendance at Board of Directors meetings
Newly appointed

Years in office: Newly appointed

April 1988 Joins NGK
June 2018 Appointed as vice president
June 2021 Appointed as director and senior vice president (incumbent)

Responsible for ESG Management Dept., Secretarial Office, Finance Dept. and Purchasing Dept.

Reasons for Appointment

Mr. Hideaki Shindo has gained experience in business operations including finance and accounting as well as in management of subsidiaries in North America and Mexico. He held positions such as General Manager of Corporate Planning Office and General Manager of Finance & Accounting Department. He is currently responsible for ESG Promotion Department, Secretarial Office, Finance & Accounting Department, and Purchasing Department in Head Office. He has an ample experience and knowledge at the Company. It is on this basis that he has been appointed.



Independent Director

Hiroyuki Kamano

Outside Director

Number of shares of the Company held
1,000

Attendance at Board of Directors meetings
100% (14/14)

Years in office: 10

April 1971 Joins Ministry of Foreign Affairs
April 1979 Trains at Legal Training and Research Institute, Supreme Court of Japan
April 1981 Becomes registered attorney
October 1988 Becomes managing partner, Kamano Sogo Law Offices (incumbent)
June 2007 Appointed as outside audit & supervisory board member, Komatsu Ltd.
July 2007 Appointed as outside director, Sumitomo Life Insurance Company
April 2009 Appointed as vice president, Tokyo Bar Association
June 2011 Appointed as director, NGK (incumbent)
June 2015 Appointed as outside audit & supervisory board member, House Foods Group Inc.
June 2020 Appointed as outside director, Spancrete Corporation (incumbent)
June 2021 Appointed as audit and supervisory committee member, House Foods Group Inc. (incumbent)

Reasons for Appointment

Having long engaged in legal practice as an attorney-at-law, Mr. Hiroyuki Kamano possesses a wealth of experience and achievements in the legal community, including his service as the vice president of Tokyo Bar Association. The Company expects him to oversee the management of the Company from an independent, objective standpoint based mainly on the perspective of compliance, by utilizing his expertise, ample experience, and broad insight. In addition, he has been appropriately fulfilling his duties as an Outside Director of the Company, by giving opinions on strengthening the compliance structure and establishing medium- to long-term business strategies, as well as offering suggestions to the Company's business operation and properly overseeing the management of the Company. It is on this basis that he has been appointed.



Independent Director

Emiko Hamada

Outside Director

Number of shares of the Company held
5,000

Attendance at Board of Directors meetings
100% (14/14)

Years in office: 4

April 1984 Joins Taiyo Yuden Co., Ltd.
December 2001 Appointed as general manager, Quality Assurance Control R Technology Div., Engineering Group, Taiyo Yuden
September 2003 Appointed as chief engineer, Basic Research Div., General Research Laboratory, Engineering Group, Taiyo Yuden
November 2008 Appointed as associate professor, Center for Social Contribution and Collaboration, Nagoya Institute of Technology (NITech)
April 2011 Appointed as professor, Center for Social Contribution and Collaboration, NITech, and professor for Master of Techno-Business Administration, NITech Graduate School
April 2012 Appointed as professor, Center for Research on Assistive Technology for Building a New Community, NITech
May 2015 Appointed as third-area program officer, A-STEP (Adaptable and Seamless Technology Transfer Program through Target-driven R&D), Japan Science and Technology Agency (incumbent)
July 2016 Appointed as part-time lecturer, NITech (incumbent)
August 2016 Appointed as visiting professor, Nagoya University (currently Nagoya University, Tokai National Higher Education and Research System)
June 2017 Appointed as director, NGK (incumbent)
June 2019 Appointed as outside director, Taiyo Yuden (incumbent)
March 2021 Appointed as member of Low-Carbon Society Strategy Promotion Committee, Center for Low Carbon Society Strategy, Japan Science and Technology Agency (incumbent)

Reasons for Appointment

Ms. Emiko Hamada has made remarkable achievements such as leading the invention and the world's first commercialization of the CD-R (recordable CD) while working for Taiyo Yuden Co., Ltd. Since then, she has been engaged in research activities mainly through industry-academia-government collaborations as Professor at Nagoya Institute of Technology and Visiting Professor at Nagoya University. The Company expects her to oversee the management of the Company from an independent, objective standpoint based mainly on the perspective of research, development, and product commercialization, by utilizing the insights she has developed through her career. In addition, she has been appropriately fulfilling her duties as an Outside Director of the Company by giving her opinion in terms of strengthening technical capability, future of new business, and quality control, as well as offering suggestions to the Company's business operation and overseeing the management of the Company. It is on this basis that he has been appointed.



Independent Director

Kazuo Furukawa

Outside Director

Number of shares of the Company held
5,000Attendance at Board of Directors meetings
100% (14/14)

Years in office: 2

April 1971 Joins Hitachi, Ltd.
 April 2005 Appointed as representative executive officer, executive vice president, and executive officer; general manager and CEO, Information & Telecommunications Group; general manager, Export Control Div.; Hitachi
 April 2006 Appointed as representative executive officer and president, Hitachi
 June 2006 Appointed as director, representative executive officer, and president, Hitachi
 May 2007 Appointed as vice chair, Keidanren (Japan Business Federation)
 April 2009 Appointed as director, representative executive officer, and vice chair, Hitachi
 June 2009 Appointed as special advisor, Hitachi
 June 2011 Appointed as president, Information Processing Society of Japan
 October 2011 Appointed as chair, New Energy and Industrial Technology Development Organization
 June 2019 Appointed as director, NGK (incumbent)
 August 2019 Appointed as outside director (audit and supervisory committee member), Pasona Group Inc. (incumbent)

Reasons for Appointment

Mr. Kazuo Furukawa has extensive knowledge of technical fields including information and telecommunications, as well as experience leading large organizations, through his work in important positions at Hitachi Ltd. such as President & Chief Executive Officer of Information & Telecommunication Systems Group and subsequently President, as well as Chairman of the New Energy and Industrial Technology Development Organization. As a specialist in running companies, Mr. Furukawa is expected to use this knowledge and experience to oversee the management of the Company from an independent, objective standpoint. In addition, he has been appropriately fulfilling his duties as an Outside Director of the Company, by giving his wide range of opinions on business strategies and business development from the perspective of investors, as well as offering suggestions to the Company's business operation and properly overseeing the management of the Company. It is on this basis that he has been appointed.

Committee Membership (As of June 30, 2021)

Name	Board of Directors	Executive Committee	Nomination and Compensation Advisory Committee	Corporate Council	Conference of Outside Directors and Outside Audit & Supervisory Board Members	Hearing Convened by Audit & Supervisory Board Members and Outside Directors	Business Ethics Committee
Taku Oshima	✓		✓	✓			
Shigeru Kobayashi	✓	✓	✓	✓			
Hiroshi Kanie	✓	✓		✓			✓
Chiaki Niwa	✓	✓		✓			
Ryohei Iwasaki	✓	✓					
Hideaki Shindo (assumed post in June 2021)	✓	✓		✓			
Hiroyuki Kamano	✓		✓	✓	✓	✓	✓
Emiko Hamada	✓		✓	✓	✓	✓	✓
Kazuo Furukawa	✓		✓	✓	✓	✓	✓

Expertise of Directors (As of June 30, 2021)

Name	Independent outside directors	Areas of experience				Specialized knowledge				
		Overall management	Overseas business and international experience	Corporate planning	Production technologies, R&D	Finance	Legal affairs and compliance	HR and labor	Information and communications	Environment and energy conservation
Taku Oshima		✓	✓		✓		✓	✓		✓
Shigeru Kobayashi		✓	✓	✓						✓
Hiroshi Kanie		✓	✓	✓			✓	✓		
Chiaki Niwa		✓			✓		✓		✓	✓
Ryohei Iwasaki		✓	✓	✓				✓		
Hideaki Shindo		✓	✓			✓		✓		
Hiroyuki Kamano	✓	✓	✓				✓			
Emiko Hamada	✓	✓	✓		✓				✓	✓
Kazuo Furukawa	✓	✓	✓		✓				✓	✓

Ratio of Independent Outside Directors

Target Ratio of Independent Outside Directors	Result	Name
One-third of the Board of Directors	1/3	Hiroyuki Kamano, Emiko Hamada, and Kazuo Furukawa

Audit & Supervisory Board (as of June 30, 2021)



Nobumitsu Saji

Audit & Supervisory Board Member

Number of shares of the Company held
5,000

Attendance at Board of Directors meetings
100% (14/14)

Attendance at Audit & Supervisory Board meetings
Newly appointed

Years in office: Newly appointed

March 1984 Joins NGK
June 2013 Appointed as vice president
June 2014 Appointed as director and vice president
June 2015 Appointed as director and senior vice president
June 2021 Appointed as Audit & Supervisory Board member (incumbent)

Reasons for Appointment

Following a variety of experience in such areas as sales and marketing in Energy Infrastructure Business Division, finance division, overseas subsidiaries, and secondment to external organizations, Mr. Nobumitsu Saji served as General Manager of Business Planning Department in multiple business groups and General Manager of Legal Department. After that, he has served as Director, responsible for legal affairs, internal audit, and compliance-related divisions, as well as leading the Company's legal compliance system as a whole. Therefore, he has ample experience at the Company and global insights in the legal and compliance fields. The Company has judged that he can contribute to improving corporate value by auditing the management of the Company as a whole through his experience and insights. It is on this basis that he has been appointed.



Takeshi Shimazaki

Audit & Supervisory Board Member

Number of shares of the Company held
817

Attendance at Board of Directors meetings
100% (14/14)

Attendance at Audit & Supervisory Board meetings
100% (14/14)

Years in office: 2

March 1982 Joins NGK
April 2010 Appointed as manager, Finance Dept.
June 2015 Appointed as general manager, Auditing Dept.
June 2019 Appointed as Audit & Supervisory Board member (incumbent)

Reasons for Appointment

After joining NGK, Mr. Takashi Shimazaki spent many years handling finance-related duties and was appointed manager of Finance & Accounting Department. He has also served as the general manager of Auditing Department and has a thorough, practical understanding of finance, accounting, and auditing within the NGK Group, both in Japan and overseas. Mr. Shimazaki is recognized for his ability to apply this experience towards the performance of management-related auditing that contributes to increased corporate value for NGK, and it is on this basis that he has been appointed.



Independent Auditor

Junichi Itoh

Audit & Supervisory Board Member,
Outside

Number of shares of the Company held
—

Attendance at Board of Directors meetings
100% (14/14)

Attendance at Audit & Supervisory Board meetings
100% (14/14)

Years in office: 3

April 1975 Joins The Mitsubishi Bank, Ltd. (now MUFG Bank, Ltd.)
June 2002 Appointed as executive officer, The Bank of Tokyo-Mitsubishi, Ltd. (now MUFG Bank)
May 2005 Appointed as managing executive officer, The Bank of Tokyo-Mitsubishi (now MUFG Bank)
June 2005 Appointed as managing director, The Bank of Tokyo-Mitsubishi (now MUFG Bank)
January 2006 Appointed as managing director, The Bank of Tokyo-Mitsubishi UFJ, Ltd. (now MUFG Bank)
May 2009 Appointed as senior managing executive officer, The Bank of Tokyo-Mitsubishi UFJ (now MUFG Bank)
June 2011 Appointed as senior executive vice president, CFO and representative director, Nikon Corporation
June 2016 Appointed as counselor, Nikon Corporation (incumbent)
Appointed as outside Audit & Supervisory Board member, The Hyakujushi Bank, Ltd.
June 2017 Appointed as outside director (Audit and Supervisory Committee member), The Hyakujushi Bank (incumbent)
June 2018 Appointed as Audit & Supervisory Board member, NGK (incumbent)

Reasons for Appointment

Mr. Junichi Itoh has many years of corporate management-related experience, including serving as a senior managing executive officer of the Bank of Tokyo-Mitsubishi UFJ (now MUFG Bank) and as a representative director, senior executive vice president, and CFO of Nikon Corporation. All of this has equipped him with a wealth of experience and expertise as a corporate management specialist, making him well-suited to a role in which he will contribute to stronger corporate governance at NGK. It is on this basis that he has been appointed.



Independent Auditor

Masayoshi Sakaguchi

Audit & Supervisory Board Member,
Outside

Number of shares of the Company held
—

Attendance at Board of Directors meetings
100% (14/14)

Attendance at Audit & Supervisory Board meetings
100% (14/14)

Years in office: 2

April 1980 Joins the National Police Agency
February 1999 Appointed as chief of First Area Headquarters, Metropolitan Police Department
September 2001 Appointed as chief of Akita Prefectural Police Headquarters
January 2003 Appointed as chief Criminal Investigations, Osaka Prefectural Police Headquarters
October 2011 Appointed as chief of Osaka Prefectural Police Headquarters
January 2013 Appointed as commissioner-general's secretariat, National Police Agency
January 2015 Appointed as deputy commissioner-general, National Police Agency
August 2016 Appointed as commissioner-general, National Police Agency
May 2018 Appointed as senior advisor, Nippon Life Insurance Company
June 2019 Appointed as Audit & Supervisory Board member, NGK (incumbent)
Appointed as vice president, Japan Automobile Federation (incumbent)

Reasons for Appointment

Prior to his appointment as Commissioner-General of the National Police Agency, Mr. Masayoshi Sakaguchi served in a variety of important positions including Chief of Osaka Prefectural Police Headquarters and as chief of the Commissioner-General's Secretariat in the National Police Agency. All of this has contributed to a wealth of experience in public administration and a solid track record of running large-scale organizations. Mr. Sakaguchi is recognized for his ability to apply this experience towards management-related auditing for NGK as a whole, providing a legal compliance and risk management-focused perspective that contributes to increased corporate value for NGK. It is on this basis that he has been appointed.

Note: Number of shares of the Company held is current as of June 30, 2021.

Executive Officers (as of June 30, 2021)

Shuhei Ishikawa Senior Vice President
Group Executive, Electronics Business Group

Jun Mori Senior Vice President
Group Executive, Ceramic Products Business Group,
General Manager, Nagoya Site

Tadaaki Yamada Senior Vice President
General Manager, Human Resources Dept., In Charge of General
Affairs Dept. HR Committee Chair, General Manager, Osaka Branch

Hiroharu Kato Vice President
General Manager, Business Strategy Dept. Global Sales &
Marketing Div., Ceramic Products Business Group

Iwao Ohwada Vice President
General Manager, Advanced Device Components Div.,
Electronics Business Group

Mayumi Inagaki Vice President
In Charge of Auditing Dept., Group Compliance Dept., Legal Dept.,
and Intellectual Property Dept.

Kazushi Tada Vice President
General Manager, Insulator Div., Energy Infrastructure Business Group

Takao Onishi Vice President
General Manager, Electronics Components Div., Electronics Business Group

Atsushi Matsuda Senior Vice President
Group Executive, Energy Infrastructure Business Group

Hiroshi Kurachi Senior Vice President
General Manager, Sensor Div.,
Ceramic Products Business Group

Akira Katoh Senior Vice President
Group Vice Executive, Electronics Business Group,
General Manager, New Metals Div., General Manager, Chita Site

Atsushi Miyajima Vice President
Group Executive, Corporate Manufacturing Engineering,
Facilities Committee Chair

Tatsumi Ichioka Vice President
General Manager, Energy Storage Div., Energy Infrastructure
Business Group, General Manager, Komaki Site

Hirofumi Sakamoto Vice President
General Manager, Engineering Div.,
Ceramic Products Business Group

Ryugo Takeda Vice President
President, NGK Europe GmbH

Tsutomu Nanataki Senior Vice President
Group Executive, Corporate R&D, Development Committee Chair

Hiroto Matsuda Senior Vice President
Group Vice Executive, Process Technology Business Group,
General Manager, High Performance Ceramics Div.

Masanobu Inoue Vice President
General Manager, Industrial Process Div.,
Process Technology Business Group

Hiroyuki Shinohara Vice President
General Manager, Corporate Planning Office,
In Charge of New Business Planning Dept.

Ryo Ishihara Vice President
General Manager, ESG Management Dept., In Charge of
Secretarial Office, General Manager, Tokyo Main Office

Hideki Shimizu Vice President
President, NGK Electronics Devices, Inc.

David Miller Vice President
President, FM Industries, Inc.

Standard and Policy for Independence of Outside Directors and Outside Audit & Supervisory Board Members

Outside Directors

In addition to the requirements for an outside director under the Companies Act and for an independent director specified by the Tokyo Stock Exchange, NGK may not designate a person who falls under any of the following items as an outside director with independence (hereinafter referred to as the "Independent Outside Director"); provided, however, that if NGK considers that such person, who falls under any of the items, is appropriate as the Independent Outside Director of NGK in light of such person's personality, insight, etc., NGK may designate said person as an Independent Outside Director on the condition that said person satisfies the requirements for an outside director under the Companies Act and for an independent director specified by the Tokyo Stock Exchange as well as on the condition that NGK externally explains the reason why such person is appropriate as the Independent Outside Director of NGK.

In these independence standards, a person who executes business refers to an executive director, executive officer, corporate officer, manager, or other employee, and NGK Group refers to NGK or NGK's subsidiaries or affiliated companies.

1. A major shareholder who holds 10% or more of the current voting rights of NGK. If such major shareholder is a corporation, a person who has executed the business of said corporation during the last three fiscal years including the most recent fiscal year.
2. A person who currently executes the business of a business partner where the amount of transactions between NGK Group in any of the last three fiscal years including the most recent fiscal year is 2% or more of the consolidated sales of either said business partner or NGK Group.
3. A person who has executed the business of a financial institution or other corporation that is a major creditor, which is indispensable for NGK Group's fundraising and on which NGK Group depends to the extent that it is irreplaceable, in the past three fiscal years including the most recent fiscal year.
4. An incumbent director or officer of an organization that receives a donation or grant from NGK Group in the amount exceeding ¥10 million per year or 30% of average annual total expenses of such organization, whichever the greater, in any of the last three fiscal years including the most recent fiscal year.
5. A certified public accountant, tax accountant or an incumbent employee of an auditing firm or tax accounting firm who served as an accounting auditor or accounting advisor of NGK Group in the past three fiscal years including the most recent fiscal year.
6. A person who is a lawyer, certified public accountant, tax accountant, or other consultant who does not correspond to any of the individuals mentioned in 5. above and who, in addition to his/her remuneration as an officer, has received cash and other property benefits of ¥10 million or more per year from the NGK Group in the past three fiscal years including the most recent fiscal year, or an incumbent employee, etc., of a law firm, auditing firm, tax accounting firm, consulting firm, or other advisory firm that does not correspond to any of the firms mentioned in 5. above, which received a payment of more than 2% of its annual consolidated gross sales from NGK Group in any of the last three fiscal years including the most recent fiscal year.
7. A person who has executed the business of a company, of which NGK is currently a major shareholder, in the last three fiscal years including the most recent fiscal year.
8. Relatives within the second degree of kinship to a person who falls under the items 1 to 7 above.

Outside Audit & Supervisory Board Members

In order to ensure that outside Audit & Supervisory Board Members are impartial and that there is no conflict of interest with shareholders, NGK makes comprehensive decisions based on the Securities Listing Regulations of the Tokyo Stock Exchange.

Reasons for Appointment of Outside Directors and Outside Audit & Supervisory Board Members

Outside Directors

Name	Reasons for appointment
Hiroyuki Kamano	<p>Having long engaged in legal practice as an attorney-at-law, Mr. Kamano possesses a wealth of experience and achievements in the legal community, including his service as Vice President of the Tokyo Bar Association. He has been utilizing his expertise, abundant experience, and wide range of insights and appropriately fulfilling his duties as an outside director of NGK, by giving his opinion mainly on the level of permeation of the NGK Group Philosophy, strengthening the compliance structure, and defining the grounds for business judgments, as well as offering suggestions to NGK's business operation and properly overseeing the management of NGK. Therefore, NGK appointed him as outside director.</p> <p>Mr. Kamano holds 1,000 shares of NGK stock. However, apart from this, he has no personal, financial, or important business relationship with, nor other vested interest in, NGK.</p> <p>Concurrent with his work with NGK, Mr. Kamano serves in a variety of roles, including as an outside auditor of House Foods Group Inc. and as an outside director of Spancrete Corporation. However, no personal, financial, or important business relationship, nor other vested interest, exists between NGK and the organizations with which Mr. Kamano currently works.</p>
Emiko Hamada	<p>Ms. Hamada has made remarkable achievements such as leading the invention and the world's first commercialization of the CD-R (recordable CD) while working for Taiyo Yuden Co., Ltd. Since then, she has been engaged in research activities mainly through industry-academia-government collaborations as Professor at Nagoya Institute of Technology and Visiting Professor at Nagoya University. By utilizing the insights she has developed through her career, she has been appropriately fulfilling her duties as an outside director of NGK by giving her opinion mainly on strengthening technical capabilities and the current state of quality management, as well as offering suggestions to NGK's business operation and overseeing the management of NGK. Therefore, NGK appointed her as outside director.</p> <p>Ms. Hamada holds 5,000 shares of NGK stock. However, apart from this, she has no personal, financial, or important business relationship with, nor other vested interest in, NGK.</p> <p>Concurrent with her work with NGK, Ms. Hamada serves in a variety of roles, including as a third-area program officer for the Japan Science and Technology Agency's A-STEP program, as a part-time lecturer at NiTech, and as an outside director for Taiyo Yuden. However, no personal, financial, or important business relationship, nor other vested interest, exists between NGK and the organizations with which Ms. Hamada currently works.</p>
Kazuo Furukawa	<p>Mr. Furukawa has extensive knowledge of technical fields including information and telecommunications, as well as experience leading large organizations, through his work in important positions at Hitachi Ltd. such as President & Chief Executive Officer of the Information & Telecommunication Systems Group and subsequently President, as well as Chairman of the New Energy and Industrial Technology Development Organization. He has been utilizing his knowledge and experience and appropriately fulfilling his duties as an outside director of NGK, by giving his opinion on a wide range of topics regarding all aspects of NGK's business activities, as well as offering suggestions to NGK's business operation and overseeing the management of NGK. Therefore, NGK appointed him as outside director.</p> <p>Mr. Furukawa holds 5,000 shares of NGK stock. However, apart from this, he has no personal, financial, or important business relationship with, nor other vested interest in, NGK.</p> <p>Concurrent with his work with NGK, Mr. Furukawa serves in a variety of roles, including as an outside director (Audit & Supervisory Committee member) for the Pasona Group Inc. However, no personal, financial, or important business relationship, nor other vested interest, exists between NGK and the organizations with which Mr. Furukawa currently works.</p>

Outside Audit & Supervisory Board Members

Name	Reasons for appointment
Junichi Itoh	<p>Mr. Itoh has been involved with corporate management for many years, including as Senior Management Executive Officer for the Bank of Tokyo-Mitsubishi UFJ, Ltd. (now MUFG Bank, Ltd.) and Representative Director, Senior Executive Vice President and CFO for Nikon Corporation. As an expert in corporate management, Mr. Itoh is able to leverage the wealth of experience and the insights he has cultivated over his long career to provide appropriate advice and oversight aimed at strengthening NGK's corporate governance. Based upon this demonstrated competency and capability, he has been selected as an outside audit & supervisory board member.</p> <p>Mr. Itoh has no personal, financial or important business relationship with, nor other vested interest in, NGK.</p> <p>Mr. Itoh comes from the Bank of Tokyo-Mitsubishi UFJ (now MUFG Bank), which is an NGK shareholder and with which NGK has financial transactions, including lending money to NGK at the end of the fiscal year under review. However, given such considerations as the significant amount of time that has passed since Mr. Itoh stepped down as senior managing executive officer of the Bank of Tokyo-Mitsubishi UFJ (now MUFG Bank), we do not believe his decisions are affected by the wishes of MUFG Bank in any way that would constitute a conflict of interest with our general shareholders.</p> <p>Mr. Itoh serves concurrently as an outside director (Audit & Supervisory Committee member) of Hyakujushi Bank, from which NGK receives financing; however, NGK has business transactions with numerous financial institutions, and the nature of the financing secured from Hyakujushi Bank is not such that NGK is in any way beholden to it. Therefore, we deem the financial borrowing relationship between NGK and Hyakujushi Bank to be one which would not impact NGK's management decision-making and, thus, does not create a conflict of interest with our general shareholders. Apart from this, no personal, financial, or important business relationship, nor other vested interest, exists between NGK and the organizations with which Mr. Itoh currently works.</p>
Masayoshi Sakaguchi	<p>Mr. Sakaguchi has a wealth of experience in the administrative sector and a proven track record in managing large organizations. He was commissioner of the Osaka Prefectural Police, chief of the Commissioner-General's Secretariat (National Police Agency), and commissioner-general of the National Police Agency. Making use of this experience, he audits NGK's overall management from the viewpoint of the legality of business and risk management, thus helping raise NGK's corporate value. We have therefore elected him to the position of outside audit & supervisory board members.</p> <p>Mr. Sakaguchi has no personal, financial, or important business relationship with, nor other vested interest in, NGK.</p> <p>Mr. Sakaguchi has served as special advisor to Nippon Life Insurance Company, which is both an NGK shareholder and a source of financing for NGK. However, as of the end of the fiscal year under review, Nippon Life Insurance Company's holdings did not exceed more than 1.36% of total NGK shares, and, with regard to the financing received, NGK has business transactions with numerous financial institutions, and the nature of the financing secured from Nippon Life Insurance Company is not such that NGK is in any way beholden to it. Therefore, we deem the shareholder and financial borrowing relationship between NGK and Nippon Life Insurance Company to be one which would not impact NGK's management decision-making and, thus, does not create a conflict of interest with our general shareholders.</p> <p>Concurrent with his work with NGK, Mr. Sakaguchi serves in a variety of roles, including as vice president of the Japan Automobile Federation. However, no personal, financial, or important business relationship, nor other vested interest, exists between NGK and the organizations with which Mr. Sakaguchi currently works.</p>

We have submitted written notification to the Tokyo Stock Exchange and Nagoya Stock Exchange of the appointment as independent directors of the above five individuals.

Board of Directors Diversity Policy

The NGK Group does not have a set policy on diversity which includes gender, race, ethnicity, nationality, country of origin or cultural background.

Effectiveness of the Board of Directors

Election of Board Members, Executive Officers, and Audit & Supervisory Board Members

With respect to the nomination of candidates for the Board of Directors and Audit & Supervisory Board, all representative directors discuss matters related to each candidate. The Nomination and Compensation Advisory Committee, of which external directors make up a majority, then deliberates matters related to each candidate, and reports the results to the Board of Directors. As for candidates for the Audit & Supervisory Board, approval is obtained from the Audit & Supervisory Board in order to secure the independence of Audit & Supervisory Board members. With consideration given to the report made by the Nomination and Compensation Advisory Committee, candidates for the Board of Directors and Audit & Supervisory Board are determined by resolution of the Board of Directors and their confirmation is set as an agenda item for the General Meeting of Shareholders. Members of the Board of Directors and Audit & Supervisory Board are then appointed by resolution of the General Meeting of Shareholders. Also, to further clarify the directors' mission and responsibilities, the term of office for directors is one year.

Training Policies for Executives

Taking into account that directors and Audit & Supervisory Board members assume the duty of care of a good manager as a fiduciary of NGK, NGK has established training policies to provide the following opportunities to improve their skills and knowledge so that they can adequately fulfill their respective responsibilities as experts in management or as supervisors of business execution.

1. Training for internal officers relating to the Companies Act, Financial Instruments and Exchange Act, competition laws, and corporate governance and compliance.
2. The provision of individual explanations from the relevant divisions to outside directors/Audit & Supervisory Board members, mainly relating to the items brought up at the Board of Directors' meetings as well as the periodic provision of information to, and opportunities to exchange opinions with, outside directors/Audit & Supervisory Board members on the business environment and other issues.

Evaluation on the Effectiveness of the Board of Directors

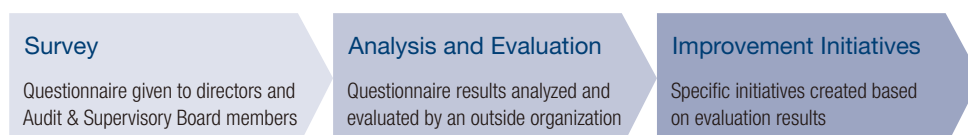
With regard to its effectiveness, the Board of Directors issues a survey at the end of every fiscal year to directors and Audit & Supervisory Board Members. The results are reported at the Board of Directors' meeting, after the analysis and evaluation by an external organization, and NGK implements specific initiatives to enhance the effectiveness of the Board of Directors based on issues identified in the results of this evaluation.

Regarding the evaluation of the Board of Directors conducted in fiscal 2020, a survey with a total of 50 questions and an open-ended section was conducted at the beginning of April 2021, and the results thereof were reported at a meeting of the Board of Directors held on June 10. Regarding the overall evaluation, we received the following comments from the external organization.

Based on the results of this evaluation, NGK will continue endeavoring to maintain and strengthen the effectiveness of the Board of Directors, including implementing specific measures suited to actual circumstances at the Company.

- The foundational elements required of the Board of Directors have been maintained, such as leadership, commitment, and its sound culture and operation. The Board of Directors also raised additional issues in order to make improvements.
- Owing to the above, the external organization considers that the Board of Directors possesses continuous effectiveness.
- In addition to continuing issues previously identified, including the understanding of risks for important, large-scale projects, and the analysis of past management decisions, etc., new issues were identified to further increase effectiveness, including medium- to long-term strategy, the optimal use of funds, and the enhancement of risk management, etc.
- In particular, there was an increasing awareness of issues within NGK related to the composition of the Board of Directors, as well as operational issues such as the establishment of proposals, etc. Therefore, continuing review of the ideal composition and functions of the Board of Directors and more focused discussions on medium- to long-term strategy and risk management are expected to contribute to further improvements in the effectiveness of the Board of Directors.

Measures to Boost Effectiveness



Management Succession Planning

In December 2018, the Board of Directors approved the NGK Group Chief Executive Officer Succession Plan, which establishes the required qualities, development policies, selection procedures, and other items for chief executive officer successors. Based on this, the President provides the Nomination and Compensation Advisory Committee with a planning progress report each year, and its appropriateness is reviewed.

Alignment of Corporate Officer Remuneration with Long-term Performance

Policies for Determining Remuneration of Directors

The remuneration system for directors (excluding outside directors) and corporate officers has been established for the purpose of contributing to the Group's sustainable growth and the enhancement of its medium-to-long-term corporate value by practicing the NGK Group Philosophy and realizing the NGK Group Vision. NGK reviews the level and composition, etc. of remuneration, etc. as necessary to determine whether they are appropriate in view of this purpose. NGK also endeavors to ensure the transparency and fairness of remuneration governance.

The remuneration of directors (excluding outside directors) and corporate officers consists of the following three components: basic remuneration, which is a fixed annual amount in accordance with their position; a performance-linked bonus that varies depending on business performance each fiscal year; and stock-related remuneration, which is designed to raise sensitivity toward the Company's stock price, share with shareholders not only the benefits of a rise in the stock price but also the risks associated with a fall in the stock price, and motivate directors and corporate officers to enhance corporate value over the medium-to-long-term through appropriate corporate management.

NGK does not pay any performance-linked bonus or stock compensation-type stock options to outside directors and Audit & Supervisory Board members and only pays fixed annual basic remuneration from a perspective that emphasizes independence because they assume roles in supervising and auditing management.

NGK emphasizes the stability and enhancement of medium-to-long-term business performance, and has designed the variable part of remuneration so that the sum of the performance-linked bonus amount and the conversion value of stock compensation-type stock options accounts for an appropriate proportion of the total amount of remuneration, etc. The total amount of remuneration, including basic remuneration, is based on data from a reliable external organization, and is set according to the position and rank of the recipient, while taking into consideration the level of remuneration according to the size of the company.

The Nomination and Compensation Advisory Committee is composed of a majority of independent outside directors. At the request of the Board of Directors, the committee deliberates on the policies and procedures for determining compensation; proposes the range of remuneration for all directors and Audit & Supervisory Board members; and proposes the amounts and details of individual remuneration for each director and corporate officer. The committee then reports its decisions on these matters to the Board of Directors.

Composition of remuneration

Basic remuneration Fixed annual remuneration corresponding to position	+	Performance-linked bonus Bonus corresponding to annual business performance	+	Stock compensation-type stock options Same benefits and risks as shareholders
Directors: Annual amount not exceeding 800 million yen			Directors: Annual amount not exceeding 200 million yen	
Audit & Supervisory Board members: Annual amount not exceeding 100 million yen				

Performance-linked bonus calculation method (Fiscal 2021)

The following indicators are used in calculating the performance-linked bonus.

Short-term perspective	<ul style="list-style-type: none"> Consolidated performance indicators for fiscal 2021: net sales, operating income, net income, and return on invested capital* Consolidated performance results for fiscal 2020: net sales, operating income, and net income
Medium-to-long-term perspective	<ul style="list-style-type: none"> Medium-to-long-term performance targets established under the NGK Group Vision: operating income Creation of new products and businesses – Keep Up 30 Initiatives to reduce CO₂ emissions

*NGK version ROIC calculated based on operating income and business assets (sales receivables, inventories, and fixed assets)

Basic bonus amount	Short-term perspective		Medium-to-long-term perspective		Individual evaluation (100%)
	Percentage returned on invested capital (100%)	Increase/decrease from previous fiscal year results (100%)	Percentage achieved of medium-to-long-term performance targets (100%)	Percentage achieved on important issues for the current fiscal year (100%)	
Amount paid	Achievement of return on invested capital ← -100 to +100% →	Change from the previous year's results ← -100 to +100% →	Achievement of medium-to-long-term performance targets ← -100 to +100% →	Achievement level of priority issues in the current fiscal year ← -100 to +100% →	Personal assessment ← -100 to +100% →

(Each allocated item varies between -100% and 100%, as a result, the actual amount of performance-linked bonuses paid fluctuates within a range of -100% to 100% of the basic bonus amount.)

Overview of stock options

- Exercise price: 1 yen/share
- Number of stock options granted according to position
- Condition for exercise of rights: Rights are vested for five years, in principle, beginning on the day when one year has elapsed after the recipient's retirement as an officer of NGK.

Amount of Remuneration for Directors and Audit & Supervisory Board Members

Remuneration of Directors and Audit & Supervisory Board Members

(Fiscal 2020)

Director category	Total remuneration (million yen)	Total remuneration by type (million yen)			Applicable directors (people)
		Fixed remuneration	Performance-linked remuneration	Stock options	
Directors (excluding Outside Directors)	591	425	123	42	11
Outside Directors	39	39	–	–	3
Audit & Supervisory Board Members (excluding Outside Audit & Supervisory Board Members)	59	59	–	–	2
Outside Audit & Supervisory Board Members	26	26	–	–	2

Directors Receiving Total Remuneration of ¥100 Million or More

(Fiscal 2020)

Name	Director category	Company category	Total remuneration by type (million yen)			Total remuneration (million yen)
			Fixed remuneration	Performance-linked remuneration	Stock options	
Taku Oshima	Director	Submitting companies	68	26	7	103

Internal Control Systems

The Board of Directors and the executive bodies overseen by the president are responsible for establishing and operating NGK's internal control system. The Auditing Department, a specialized internal audit body, is responsible for assessing the status of business execution at each operating division. Moreover, NGK has established the Internal Controls Committee to manage its reporting system for internal controls pursuant to Japan's Financial Instruments and Exchange Act.

The NGK Group Code of Conduct (revised in January 2019) was established as a policy embodying the Group's corporate philosophy. These guidelines specify the Group's fundamental stance with respect to business activities and corporate behavior to ensure it remains a company that is beneficial to society, even in the pursuit of its economic goals. The task of ensuring Group-wide compliance with the NGK Group Code of Conduct, along with laws, regulations and corporate ethics, is the responsibility of the Compliance Activity Promotion Subcommittee, which was established by the Compliance Committee and comprises managers from NGK divisions. The Business Ethics Committee handles matters of improper acts and legal violations involving NGK executives, and the ensuring of compliance with competition laws and overseas anti-corruption laws.

Please note that at a Board of Directors meeting in April 2021, members adopted an amendment to the "Resolution for the Development of Systems to Ensure the Appropriateness of Operations."

Average Employee Remuneration and President Remuneration

At NGK, the remuneration for the President was 13.5 times that of the average employee remuneration.

(Fiscal 2020)

President Remuneration	103,000,000 yen
Average Employee Remuneration	7,635,830 yen

Communication with Shareholders

Open General Meeting of Shareholders

NGK endeavors to hold open General Meeting of Shareholders that its shareholders feel welcome to attend. Every year, we introduce NGK corporate activities at the General Meeting of Shareholders with booths displaying product exhibits explained by NGK staff.

We also make efforts toward expanding General Meeting of Shareholders-related information, including the following:

(1) Mailing a convocation notice well in advance	Sent 22 days prior to the meeting date.
(2) Disclosing information on the website well in advance	Announced four days before convocation notices are sent out (since fiscal 2018).
(3) Taking part in the Tokyo Stock Exchange (TSE) Electronic Voting Platform*	Online voting system made available.
(4) Posting General Meeting of Shareholders documents on the website	Documents such as convocation notices, the results of vote execution, notices of resolution, and extraordinary reports. Notices for the General Meeting of Shareholders in English.

General Meeting of Shareholders-related information
<https://www.ngk-insulators.com/en/ir/meeting/>

* TSE Electronic Voting Platform: An electronic voting system operated by TSE. It allows people to vote not only through the conventional printed materials but also via the Internet, making the process more convenient for shareholders in Japan and overseas.

Two-Way Communication

In addition to regular presentations held in Japan and overseas, the NGK Group conducts one-on-one meetings and participates in interviews among other ongoing initiatives to expand dialogues with institutional investors. NGK senior management also visits and conducts one-on-one discussions with institutional investors in Japan and overseas.

Activities in Fiscal 2020

Activities	Details
Japan	Senior management conducted presentations for analysts and institutional investors twice this year. They also conducted one-on-one meetings and participated in interviews.
Overseas	Senior management conducted overseas IR meetings targeting analysts and institutional investors twice this year.
Online IR Library	Included financial reporting information, the timely disclosure of non-financial reporting information, securities reports, annual reports, General Meeting of Shareholder materials, and other information.

Reference
URL

Investor Relations

<https://www.ngk-insulators.com/en/ir/>

Participation in Nomura IR Asset Management Fair

To familiarize individual investors with the details of NGK business and performance, we took part in the Nomura IR Asset Management Fair 2021 (hosted by Nomura Investor Relations Co., Ltd. and cosponsored by Nomura Securities Co., Ltd.).

A total of 37 listed companies and investment firms participated in this year's event, which was held online in order to prevent the spread of COVID-19. At our booth we used corporate introduction videos, company guides, NGK reports, and other materials to provide visitors with a detailed overview of our company and financial data.



A company representative gives an easy-to-understand online introduction to NGK

Measures for Returning Profits to Shareholders

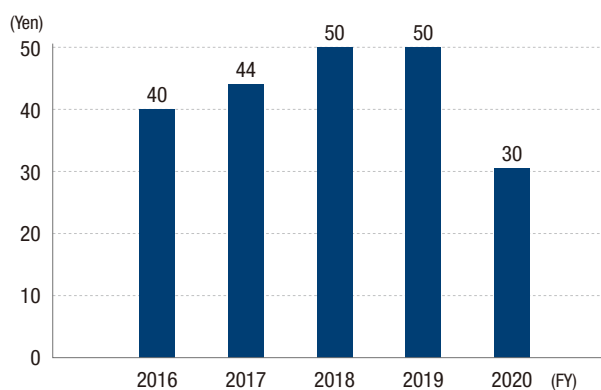
At NGK, returning profits to shareholders is considered one of the highest management priorities.

As a basic policy, we aim for management that focuses on shareholders and ROE. Based on this basic policy, we share profits while comprehensively taking account of our business performance, financial structure, and future business development. Our medium-term benchmark for the consolidated payout ratio is around 30%.

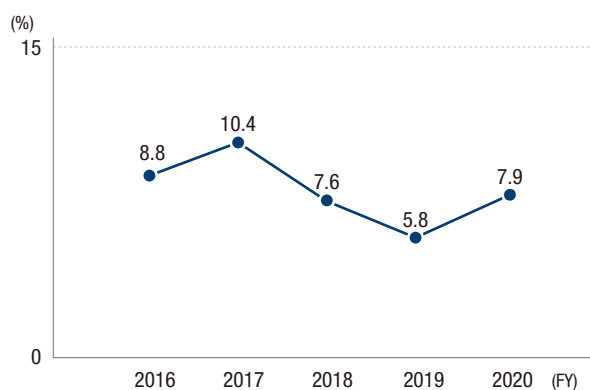
In fiscal 2020, we paid an annual dividend of 30 yen. The consolidated payout ratio stood at 24.7%.

We will keep striving to secure profitability above the capital cost and to maintain financial soundness. We opt to proactively return profits to our shareholders from the medium-to long-term perspective.

Dividends per Share



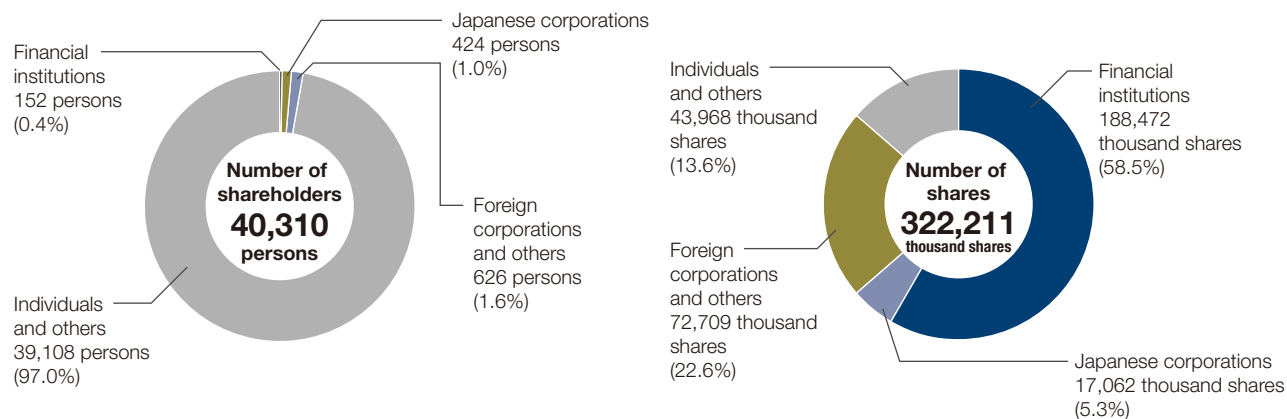
Return on Equity (ROE)



Shareholder Information

Stock Information (as of March 31, 2021)

Total number of shares authorized	735,030,000
Total number of shares issued	322,211,996 (including 5,639,001 treasury shares)
Number of shareholders	40,310



Major Shareholders (as of March 31, 2021)

Name of shareholder	Number of shares held (1,000 shares)	Shareholding ratio (%)
The Master Trust Bank of Japan, Ltd. (Trust Account)	43,739	13.81
Custody Bank of Japan, Ltd. (Trust Account)	31,026	9.80
Meiji Yasuda Life Insurance Company	21,695	6.85
The Dai-ichi Life Insurance Company, Limited	21,457	6.77
MUFG Bank, Ltd.	7,204	2.27
National Mutual Insurance Federation of Agricultural Cooperatives	7,029	2.22
Aioi Nissay Dowa Insurance Co., Ltd.	4,387	1.38
Nippon Life Insurance Company	4,313	1.36
Custody Bank of Japan, Ltd. (Trust Account 7)	4,146	1.30
State Street Bank West Client – Treaty 505234	3,791	1.19

Note: The above list of major shareholders does not include NGK, which holds a total of 5,639,001 treasury shares. Also, the shareholding ratios above are calculated based on the number of shares derived by deducting the number of treasury shares from the number of shares issued, and rounded down to two decimal places.

None of the shareholders who control 5% or more of the voting rights are members of the NGK founder's family.

Materiality

Priority Issues

The following are priority issues for the NGK Group.

① Promotion of ESG Management

ESG is central to the management of the NGK Group. We have 37 Group companies (including 18 manufacturing companies) across 19 countries, and, amidst ongoing overseas business expansion, we seek to ensure greater managerial transparency and autonomy within an environment that cultivates within every member of the NGK Group a sense of fairness accompanied by decision-making and action, which accords with international norms.

In April 2019, the ESG Committee was established as a body for information sharing, opinion exchange, and policy discussion among senior management, and this has now been followed by the establishment of the ESG Management Department in April 2021 in order to handle lateral implementation of ESG-related activities across the NGK Group and to strengthen information dissemination about the activities. In addition, we create various opportunities for dialog among all Group members about how to contribute to a more sustainable society, respect human rights, and ensure compliance, and we are working to familiarize all personnel with the NGK Group Code of Conduct.

② Strengthening Profitability of Existing Business and Creating New Products and Businesses

As part of our efforts to strengthen the profitability of existing business, we launched the Manufacturing ∞ (Chain) Innovation initiative in fiscal 2021 as a follow-up to the company-wide New/Reformed Manufacturing Structures initiative. This new initiative is focused on activities all across the process chain—from product development to manufacturing and sales—that contribute to increased competitiveness. The two central focuses of the initiative are production innovation activities which fill in the gap between the ideal and reality in the manufacturing chain and cost reduction activities, which improve manufacturing costs by reducing loss at production sites. The activities of this initiative will be driven by digital technology to achieve greater transparency and global integration in manufacturing, thereby leading to greater competitiveness.

Also, with the aim of fostering digital technology-driven improvement in business competitiveness, the Digital Transformation & Innovation Department was established in April 2021. Functions that have previously been distributed among different divisions have been consolidated into the Digital Transformation & Innovation Department, which will work on integrating digital and production technology to address company-wide, cross-cutting issues for the sake of accelerating operational reform. In terms of human resource development, job grade-specific training is being pursued, which will improve digital literacy across the company, as well as cultivate DX leaders who will promote problem solving from a digital standpoint. We are using initiatives such as these to foster a change in employee awareness and thinking and, thereby, our corporate culture.

The NGK Group seeks to combine the characteristics of various ceramics with its own unique technologies in order to provide society with new value. With regard to the creation of new products and businesses, we have established our “Keep Up 30” goal aimed at ensuring new products remain 30% or more of our sales, and, as part of this, we are working to bring to market our zinc rechargeable batteries, subnano-ceramic membranes, and other new products as soon as possible.

Further, under the NGK Group Vision: Road to 2050, which was developed based on anticipated changes in society by 2050, we are focusing heavily on carbon neutrality (CN)-related business, which will contribute to coexistence between humanity and nature, and digital society (DS)-related business, which will contribute to safer, more convenient, more comfortable, and healthier quality of life. Our goal is to secure a total of 300 billion yen in research and development over the next 10 years, with 80% of that being allocated to CN and DS-related fields. We have created the “New Value 1000” milestone target for ourselves to achieve 100 billion in sales from new products and new businesses by 2030. We will continue to pursue focused investment of business resources into promising development themes and to make use of our unique ceramic technologies to generate new products and new businesses.

Materiality Identification Process

We have not publicly disclosed our process for identifying materiality.

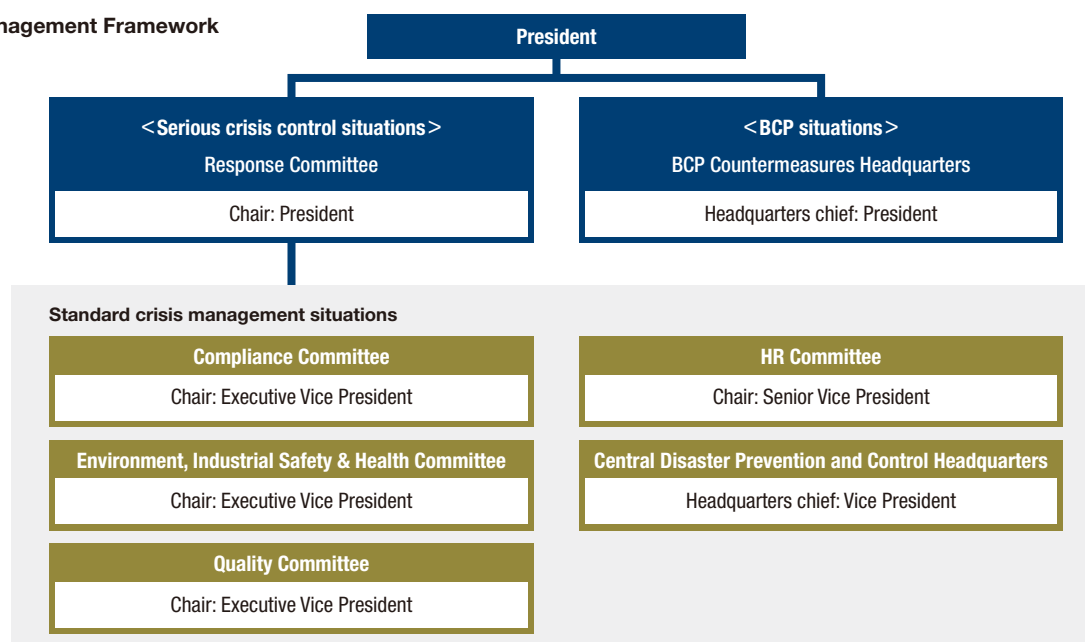
Risk Management

Approach to Risk Management

The NGK Group addresses the issue of serious risk by empowering the following committees to facilitate risk avoidance and prevention, in accordance with the Basic Rules of Crisis Management. Additionally, in the event of some particularly significant risk, the vice president in charge of the Corporate Planning Office can call a meeting, which would include the president, to develop countermeasures.

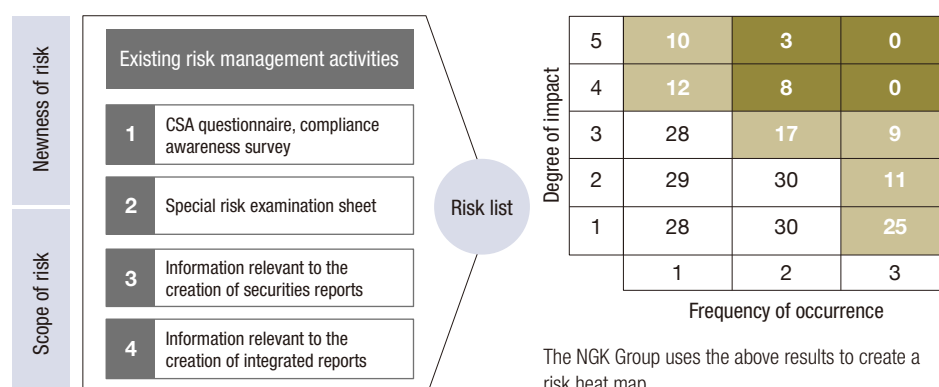
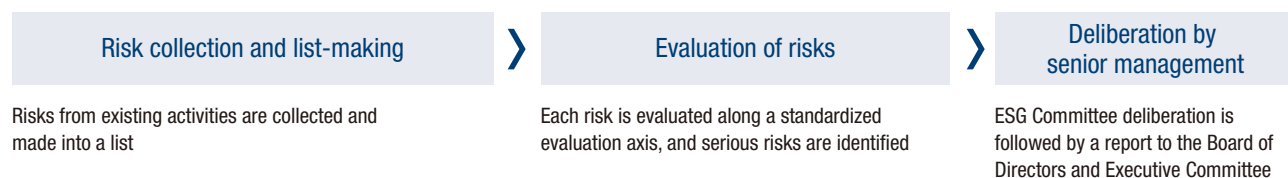
In times of increasing socio-economic uncertainty, it is important to have a heightened awareness of risk and to act before risks turn into crises. Therefore, in addition to the five committees, which we maintain in order to oversee matters of day-to-day risk, we also have in place a system by which top management can coordinate a rapid response to growing risks.

Risk Management Framework



Risk Identification Process

All risks discovered through the standard risk management process, which have the potential to affect the operational or financial situation of the Group are collected and reevaluated in order to identify any which may be serious risks. The ESG Committee will then deliberate and designate those risks that need to be managed by the Group as a whole.



Risks, Risk Summaries, Risk Responses

1 Business operation risks 2 R&D-related risks 3 Legal compliance, human rights and safety, and quality-related risks
4 Information systems-related risks 5 Currency exchange, capital, and procurement-related risks 6 Climate change and disaster-related risks

Risk	Summary	Response
1	All operations <ul style="list-style-type: none"> Demonstrations, terrorism, war, infectious or communicable disease, and other unforeseen matters 	<ul style="list-style-type: none"> Construct globally distributed, alternative systems
	1 Ceramic Products Business <ul style="list-style-type: none"> Drop in demand for NGK Group products due to decline in demand for internal combustion engine vehicles Drop in market share due to rising competition from Chinese market Inability to recover prior investment due to downturn in business, delayed timing of regulations, or other factors 	<ul style="list-style-type: none"> Compensate for drop in demand by increasing number of new and high-performance products in line with stronger exhaust regulations Strengthen competitiveness via technical responsiveness that anticipates environmental regulations, and via supply stability Respond appropriately to automaker planning and changing business conditions, and then make revisions to capital investment planning
	2 Process Technology Business <ul style="list-style-type: none"> Deterioration in performance and financial status due to declining demand for semiconductors Delayed responsiveness to customer needs Emergence of innovative semiconductor manufacturing process Drop in market share due to growth of competition in kilns for lithium-ion battery cathode materials and electronic components 	<ul style="list-style-type: none"> Work together with direct customers who manufacture semiconductor manufacturing equipment, and make revisions to equipment capacity and personnel and production systems, etc., where appropriate Carefully monitor semiconductor manufacturing process trends and revise production systems where appropriate to ensure quick response to changes in demand Carefully monitor customer trends and pursue production system innovation where appropriate to ensure quick response to changes in demand
	3 Electronics Business <ul style="list-style-type: none"> Sudden drop in base station and data server demand Inability to develop new technology or release products compatible with customer technology innovations 	<ul style="list-style-type: none"> Carefully monitor customer trends and pursue production system innovation where appropriate to ensure quick response to changes in demand Carefully monitor customer trends and pursue timely technological development
	4 Energy Infrastructure Business <ul style="list-style-type: none"> Change in energy policies overseas Capital investment cutbacks by power companies in Japan Trends among competitor companies and products Delay in timing of market expansion for large-capacity and long-life batteries Spread of competitors' products, such as lithium-ion batteries, that use innovative technologies 	<ul style="list-style-type: none"> Carefully monitor energy policy trends in each country and revise production systems where appropriate to ensure quick response to changes in demand Strengthen competitiveness via technical responsiveness and supply stability Carefully monitor customer trends and revise production systems where appropriate to ensure quick response to changes in demand Strengthen partnerships with leading overseas companies
2	<ul style="list-style-type: none"> Inability to achieve adequate results with the input received due to increasingly complicated technological competition 	<ul style="list-style-type: none"> A total of 300 billion yen will be set aside for research and development expenses over the next 10 years, 80% of which will be allotted to the carbon neutrality (CN) and digital society (DS) Set a target of 100 billion yen in sales from new products and new businesses by 2030
3	1 Legal compliance-related risks <ul style="list-style-type: none"> Decline in NGK Group's reputation due to actions in opposition to society's expectations with regard to legal and regulatory compliance, respect for human rights, contract compliance, etc. 	<ul style="list-style-type: none"> Utilize employee training and handbook distribution to ensure employees are familiar with relevant laws and regulations and have a more compliance-focused mindset The Business Ethics Committee, which comprises outside directors and compliance officers, investigates serious improprieties or legal/regulatory violations that could have a significant impact on management, and recommends preventive and corrective measures. Reducing the possibility of compliance violations through a whistleblowing system
	2 Human rights and safety-related risks <ul style="list-style-type: none"> Human rights violations in the Group's business activities Employee occupational hazards, illness, or physical and mental health problems 	<ul style="list-style-type: none"> Formulation of the NGK Group human rights policy Undertake human rights due diligence via HR Committee In accordance with NGK Safety and Health Policy, identify serious hazard risks and use risk assessment to facilitate strengthening of preventative measures Follow up on employees who work long hours, and conduct job grade-specific mental health education
	3 Quality-related risks <ul style="list-style-type: none"> Quality-related risks such as loss of trust or profits, or contraction in growth, due to serious market complaint, contractual violation, or other unsatisfactory operations 	<ul style="list-style-type: none"> Have Quality Management Department perform monitoring of each Business Group's quality activities, in line with NGK Quality Policy and under direct supervision of senior management Regarding serious issues, convene quality review meetings in order to find a solution quickly Company-wide deployment of quality risk elimination process activities
4	<ul style="list-style-type: none"> Negative impact on societal trust or business continuity due to shutdown of data processing, or to theft, destruction, manipulation, loss, etc., of data, following external cyber-attack or unauthorized system access, or after unexpected system failure or security issue 	<ul style="list-style-type: none"> Establishment of an IT security system based on the Basic NGK Group Information Security Policy Conduct information security training for employees
5	<ul style="list-style-type: none"> Decreased sales and profits and deterioration of business performance due to strong yen Risk of negative impact on business operations, performance, and financial situation of NGK Group as a result of financing difficulties stemming from serious regional financial crises and other factors Rising production costs due to rise in prices of certain materials and equipment 	<ul style="list-style-type: none"> Keep production close to local demand centers, perform financing in local currency, and optimize purchasing according to currency exchange situation Hedge risks with forward foreign exchange contracts and other financial instruments Reflect risk in sale price Reduce costs through competitive purchasing, increased productivity, and other means
6	<ul style="list-style-type: none"> Deterioration in business performance due to additional costs incurred by future international GHG regulations, environmental taxes, carbon taxes, etc. Operational decline due to global warming-caused sea level rise, increased size and magnitude of typhoons, increased frequency of local torrential rains, etc. Deterioration in business performance due to shutdown of production following major disaster, fire, or other serious incident or accident Serious damage to facilities at major production bases due to disasters, fires, or other serious incident or accident Decline in operations and negative impact on product manufacturing and sales due to emergence and spread of major infectious disease, such as influenza or COVID-19 pandemic 	<ul style="list-style-type: none"> Formulation of the NGK Group Environmental Vision Begin looking into disclosing information on risks and opportunities based on recommendations from the Task Force on Climate-related Financial Disclosures (TCFD) Development and introduction of products and services that contribute to the realization of a carbon-neutral society Establishment of a production system that enables alternative production Promote business continuity plan (BCP) for entire Group

Legal Risk Management at Group Companies Outside Japan

The NGK Group is engaged in strengthening its ascertainment of legal risk management status in overseas business to minimize the globalizing and diversifying risks associated with business expansion.

We ask all Group companies outside Japan to report information pertaining to the status of lawsuits, legal affairs and consultation with lawyers twice a year, and whistleblowing system usage, export controls and access to legal-related information once a year. Major issues found in such reports are reported to the Compliance Committee to share information. Consultations from bases outside Japan are handled by lawyers and legal departments to avoid risks.

Identifying and Preventing Risks Based on Questionnaire

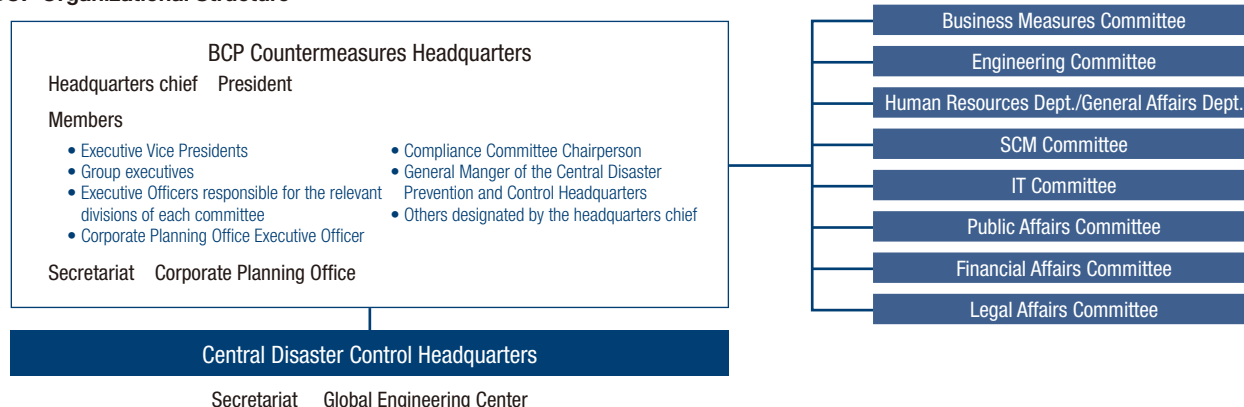
As part of efforts to enhance risk management practices, in fiscal 2019 NGK and its Group companies in Japan conducted the second CRS (Corporate Risk Survey). Combining the previously administered CSA (Control Self-Assessment) questionnaire and the compliance awareness survey, the CRS checks the understanding of respondents regarding the possibility of risk and its implications with the goal of grasping and preventing various potential risks arising from daily business operations. Based on the results of the survey, the relevant divisions and departments create measures to reduce risks.

Business Continuity Plan (BCP) Initiatives

At NGK, we have established the BCP Countermeasures Headquarters as an organization for leading business continuity and quick recovery, under the direction of the president, in the event of a large-scale natural disaster, and we are promoting BCP for the Group as a whole. Measures include the establishment of multiple manufacturing bases and procurement sources, damage mitigation measures related to buildings and equipment, and employee safety assurance.

We conduct emergency drills assuming a major disaster with the aim of enhancing our responsiveness and adaptability in the event of a disaster crisis. In the drill, participants are instructed to take real actions faithfully according to the plan, through which we identify in detail issues related to each process and procedure and use the findings to improve the BCP.

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.

FY2020 Initiatives

- | | | |
|-----------|--|--|
| Education | | • Carried out video-based earthquake and water disaster training for all NGK Group employees in Japan |
| Awareness | | • Included special feature articles on household disaster preparedness in the <i>MIZUHO</i> in-house newsletter
• Conducted a survey of household disaster preparedness-related efforts |
| Training | | • Revised our training scenarios to make them more effective |
| Other | | • Revised the action plan based on insights gleaned from the prior fiscal year's BCP practical training |

Future Initiatives

- Increase the level of training further (e.g., hold BCP training for implementation units)
- Ongoing BCP practical training
- Ongoing household disaster preparedness support initiatives (seminars, follow up on progress via surveys, etc.) focused on ensuring that respect for human life remains the top priority of BCP (held disaster preparedness seminars, conducted follow-up progress surveys, etc.)

Response to the COVID-19 Pandemic

In light of the COVID-19 pandemic, the NGK Group activated its BCP in April 2020. Along with gathering and sharing up-to-date information about the current situation, ensuring employees are familiar with information about infection prevention, encouraging telecommuting and other options, and distributing surgical masks to employees, we are monitoring factors that hinder business activity and are developing response measures for them. All of these actions are being taken from an “employee and community safety-first” mindset, and they are aimed at ensuring we can continue our business activities in a socially responsible manner.

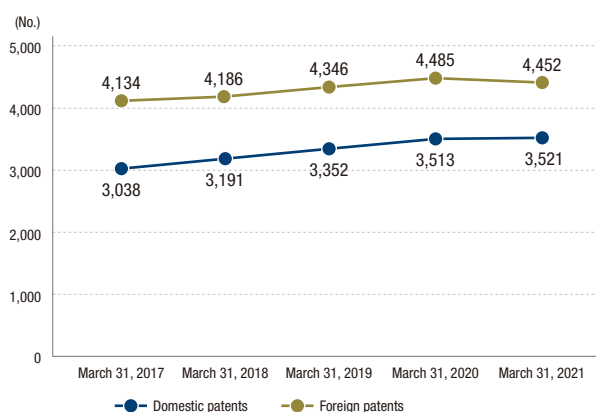
Intellectual Property Management

The NGK Group encourages the creation of intellectual property (IP) rights and works to ensure proper protection and use of IP rights. In addition, based on the policy of respect for the rights of others and ourselves, it aims for a strategic patent network to be built within the close cooperation between the Intellectual Property Department and other divisions such as Business, Research and Development, and Technology Divisions.

Specifically, it features a patent mapping function to present the internal and external patent landscape of specific technology areas using charts and graphs, which can be easily shared within the Group.

To prevent patent infringement risks, we regularly conduct patent monitoring of other companies for product families and development themes to update our database.

Change in the Number of Patents Held

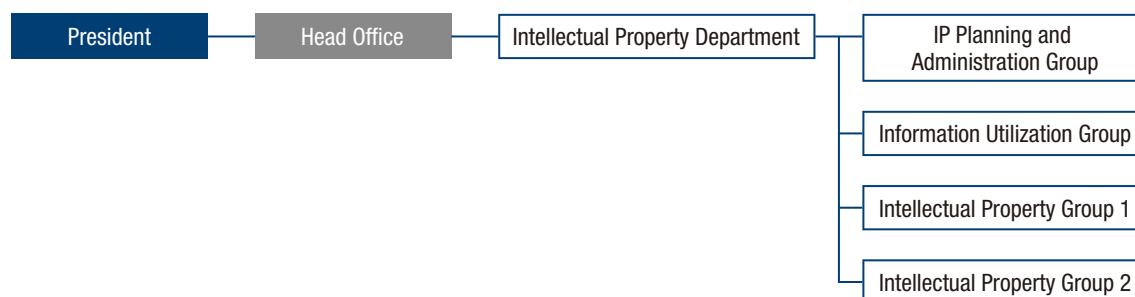


Number of Patents Held As of March 31, 2021

Domestic patents **3,521**
Foreign patents **4,452**

Intellectual Property Management System

Integrated management of intellectual property for the entire NGK Group is carried out by the Intellectual Property Department. This department also pursues intellectual property-related activities in conjunction with various other departments and divisions.



Responsibilities of the Intellectual Property Department

Application for/acquisition of IP rights (patent, utility model, design): Establish IP rights for NGK's research and development achievements to safeguard corporate assets on a legal basis

Patent search: Analyze the current patent landscape of other companies to prevent patent infringement risks

Administration and operation of patent management systems

Administrative work relating to acquired patent rights, including maintenance of rights, operation of the employee invention compensation system, and cooperation with patent law firms

Application for/acquisition and maintenance of trademark rights for corporate logos and product trade names and marks

Copyright

In-house training of intellectual property

Intellectual Property Training

Training for Young Engineers

E-learning and seminars are provided with the aim of providing basic training for young engineers and of up-skilling for patent applicants.

Also, focusing primarily on young engineers in the Research and Development Department, trainings in patent search methods are conducted. These methods are taught via individual, computer-based practical training.

In fiscal 2020, training was carried out via remote learning in response to the COVID-19 pandemic.

IP Training Provided in FY2020

	Intended participants	Number of participants
Patent Act introductory e-learning	Young engineers	82
Seminars on the patent system (Patent I/II/III)	Young engineers	168
Seminars to acquire skills for using the IP search program	Employees in charge, engineers	186
Small-group workshops	Young engineers in the Business and the Research and Development Divisions	272 (total for 28 sessions)

Education Program for Managers

NGK implemented an education program for managers in order to improve intellectual property strategy within business divisions and the Research and Development Division.

In March of fiscal 2020, the 10th “Thinking about Intellectual Property” seminar was held, with participants taking part via remote learning. The former head of the Intellectual Property Division of Seiko Epson Corporation, Mr. Masataka Kamiyanagi, was invited to present the seminar, choosing as his theme: “Intellectual Property Strategy for Business Success.” Around 200 took part in this seminar focusing on how to approach intellectual property strategy in the midst of a changing business and intellectual property environment in order to find success in business.

Employee Invention Compensation System to Provide Incentives for Employee Inventions

In order to further encourage employees to create outstanding inventions, a revamped employee invention compensation system was launched in April 2019, which is divided into four categories: application incentives, registration incentives, implementation incentives, and excellent invention incentives.

The aim of the newly established “excellent invention incentives” category is to recognize, via a substantial financial reward and commendation, the contributions inventors of particularly outstanding inventions have made to NGK. Recipients are presented with either the Contributory Invention Award, which recognizes patents and know-how that have contributed significantly to business performance, and the Innovative Invention Award, which recognizes patents, patent applications, and know-how for truly innovative inventions.

In fiscal 2020, after repeated and meticulous scrutiny of the petitions from inventors, two petitions were chosen for the Contributory Invention Award and one for the Innovative Invention Award. This was also the first time the Contributory Invention Award has been given for know-how.

Responding to Intellectual Property Risks Outside Japan

To support our business for automotive exhaust purification ceramic products, for which we conduct manufacturing on a global scale, we have built a mechanism for properly managing inventions at overseas plants. NGK promotes the practice of intellectual property management overseas at the same high level as in Japan.

TOPIC

Since fiscal 2020, a member of the Intellectual Property Department has been dispatched to patent law firms in the U.S. in order to help us improve the efficiency of our operations by gathering the latest intellectual property information from the U.S., receiving practical training, and facilitating smoother communications with our representatives.



Mr. Takeru Torigoe (at right) from the Intellectual Property Department has a COVID-safe meeting with U.S. attorneys at law

Business Code of Conduct

Code of Conduct

NGK Group Code of Conduct

The NGK Group Code of Conduct has been compiled as a guideline for everyone who works within the NGK Group so that they are aware of what is expected of them in terms of work-related compliance in order to ensure honesty and reliability in our business activities. All NGK Group employees will act according to this code as they fulfill their social responsibilities and build trust in NGK.

At the beginning of fiscal 2020, the Chief Compliance Officer delivered an awareness-raising message to the entire NGK Group including Group companies in Japan and overseas about the Code of Conduct. At NGK, Group Compliance Department staff conducted 23 training sessions at model workplaces and also explained putting into practice the Code of Conduct in the NGK Group Philosophy Sharing Program in fiscal 2020. Awareness and understanding of the Code of Conduct is also facilitated with training given to all recent graduate and mid-career hires upon their joining the company, as well as with refresher training given to employees upon their promotion.



Like last year, awareness-raising was also promoted via informative posters displayed in workplaces

Realization of a Sustainable Society



1. We will create new value through the provision of products and services that contribute to society, protect the world environment, and strive to realize a sustainable society.

- By providing high quality products and services in which safety is properly considered and which comply with environmental rules, we can respond to the trust of customers and society.
- We will sincerely consider new needs and the desire for improvements from customers and society and undertake product and service development and upgrades.

Respect for Human Rights



2. We will strictly comply with international standards of human rights and respect the diversity of all people.

- We will respect human rights and undertake business activities without the use of forced labor or child labor.
- We will respect the individuality and independence of each employee and not engage in discrimination on the basis of race, citizenship, gender, age, religion, belief, existence of handicaps, sexual diversity, or any other aspect.
- We will prevent the occurrence of harassment in the workplace and take prompt and appropriate action in the case where it occurs.

Provide a Safe and Enjoyable Work Environment



3. We will provide a safe and enjoyable work environment that is comfortable for everyone to work in for all.

- We will strictly comply with laws and regulations of each country and region relating to labor, safety, and sanitation.
- We will aim to harmonize work and life, and support a variety of working styles.
- We will build up a relationship of trust through sincere debate and discussion with employees.
- We will give educational opportunities to employees and provide opportunities to stretch their motivation and abilities.

Honest Business Activities



4. We will undertake fair and transparent business activities with integrity and strictly comply to international standards, laws and regulations of each country and region.

- We will undertake business activities with common sense and based on strict compliance and ethics.
- We will ensure performance of contracts and agreements with customers and counterparties.
- We will strictly comply with competition laws.
- We will never in any manner undertake bribery
- We will strictly manage personal data and confidential information.
- We will respect the intellectual property rights of other persons.
- We will set up and actively manage our import/export system.
- We will not have any involvement with organized crime and other anti-social forces.
- We will manage business risks and make efforts to prevent the occurrence of problems and promptly respond when they arise.
- In order to deter and correct improper acts, we will appropriately prepare and put into practice a whistleblowing system.

Disclosure of Company Information and Accountability



5. We will increase healthy and transparent management by active disclosure of information and discussion with stakeholders.

- We will accurately and promptly disclose information required by society.
- We will take seriously the voices of our stakeholders and fulfill our obligation of accountability.

Permeate Social Responsibility into Our Supply Chain



6. We will promote a structure that fulfills societal responsibilities to our trade counterparts and the supply chain overall.

- We will respect our trade counterparts as equal partners and work to build a trusting relationship for mutual development.
- Through realization of green procurement and CSR, we will contribute to the growth of the region and society.
- We will demand respect for human rights and compliance with laws and regulations from our supply chain.

Preservation of Environment



7. We will work to preserve and resolve the problems of the world environment.

- We will provide products and services that contribute to preservation of the world environment.
- We will directly address the burden of business activities on the environment.
- We will work for preservation of biological diversity and sustainability.
- We will strictly comply with laws and regulations relating to the environment of each country and region.

Cooperation with the Region and Society



8. We will contribute to the expansion of the region and society as a good corporate citizen.

- As one member of the region and society we will actively undertake activities that contribute to society.
- We will actively support activities that contribute to society in which employees voluntarily participate.

Scope of Application

The NGK Group Code of Conduct applies to suppliers and the entire NGK Group including companies in Japan and overseas.

All employees at NGK and NGK Group companies in Japan and overseas are provided with, and familiarized with, the NGK Group Code of Conduct upon joining the company, and they also receive job grade-specific training and other instruction. Also, all employees of NGK and Group companies in Japan are provided with a guidebook on putting the Code of Conduct into practice.

Compliance Promotion Structure

In order to ensure strict observance of laws, regulations, and corporate ethics within the Group, we have established the Compliance Committee, and under this we have established the Compliance Committee Secretariat Council to serve as the committee body that ensures the proper implementation of the Compliance Committee's decisions.

Establishment of the Global Compliance System

With the aim of building a group-wide foundation for an effective compliance scheme, the Group Compliance Department conducts education on compliance at each NGK base.

Compliance Promotion Structure



Mission of the Group Compliance Department

Embed the idea of "compliance first" within the corporate culture across the NGK Group

Ensure thorough compliance throughout the NGK Group by promoting compliance activities, which meet international norms and establishing mechanisms for ongoing improvement

As for Group companies outside Japan, promote compliance for our globalized operations by obtaining the most up-to-date information regarding applicable laws and social demands in each region

Basic Guidelines for NGK Group Compliance Activities

In April 2021, the Basic Guidelines for NGK Group Compliance Activities were formulated.

The idea of what constitutes good compliance activities continues to evolve worldwide amidst a changing social and legal landscape, and the NGK Group requires mechanisms for objectively evaluating and verifying, as well as continually improving, its own activities in light of international norms.

It is also important that compliance-related activities as a whole be improved qualitatively by ensuring that compliance-related ideals and values be standardized not only in areas of legal compliance but also in areas such as safety, the environment, and quality.

Thus, it was in this context that the new Basic Guidelines for NGK Group Compliance Activities were created in order to codify in writing the NGK Group's basic stance on, and approach to, compliance activities.

Starting this fiscal year, related business groups and divisions will work together to qualitatively improve, in line with these Guidelines, compliance activities with regard to safety, the environment, quality, exports, competition laws, etc., so that they are more effective.

Mission Achievement-focused Initiatives of Fiscal 2020

- Formulation of Basic Guidelines for NGK Group Compliance Activities
- Compliance education (NGK and Group companies in and outside Japan)
- Adapting to global laws and regulations (competition laws, anti-bribery laws, etc.)
- Operation and maintenance of a whistleblowing system
- Quality compliance system operational support

Corruption Prevention Structure

The NGK Group Code of Conduct states that “we will never in any manner undertake bribery” and “we will undertake business activities with common sense and based on strict compliance and ethics”; in line with this, the NGK Group implements anti-bribery measures in order to ensure fair and transparent transactions. In fiscal 2015, we instituted anti-bribery rules for dealing with foreign public officials in order to ensure compliance with anti-bribery laws as well as ethical standards for business conduct. Further, in fiscal 2017 our Auditing Department began a review of overseas money transfers and entertainment expenses.

Conducting Anti-Bribery Training

Since fiscal 2019, we have not only had our in-house lecturers provide job grade-specific training to NGK employees, we have also invited outside lawyers to deliver interactive lectures as well as small-group, case study-focused training sessions in our sales divisions. In addition, we have also arranged for attorney-led seminars and other training at all Group companies.

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 Code of Conduct and to facilitate the quick resolution when issues occur. Each Group company outside Japan has its own helpline.

Number of Helpline Consultation Cases (at NGK)

FY2016	FY2017	FY2018	FY2019	FY2020
17	43	75	55	28

Hotline

We have established a hotline as a whistleblowing system for responding to fraud and legal infractions committed by senior management of NGK, and competition law and anti-corruption law-related violations. The hotline is operated by outside lawyers, with issues handled by the Business Ethics Committee, composed mainly of outside directors, who report directly to the Board of Directors.

We have been pushing forward with the establishment of the hotline at Group companies outside Japan in light of the circumstances in each country. We have, however, established contact points at all Group companies outside Japan for reporting competition law and anti-corruption law-related violations.

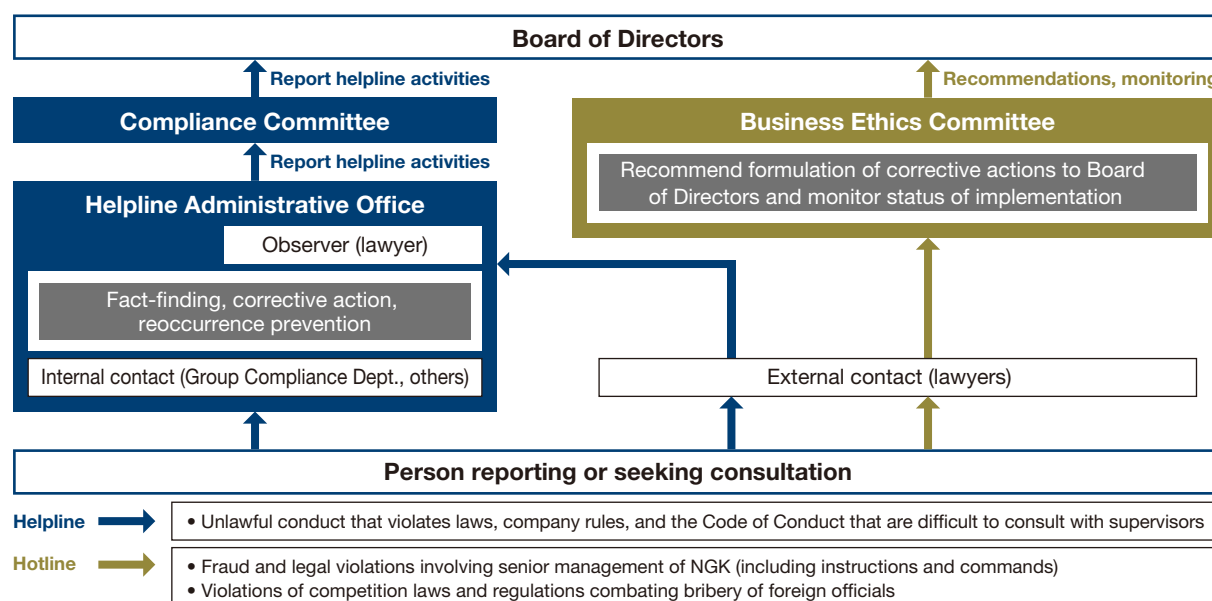
Whistleblowing System

A whistleblowing system is in place, which everyone who works for NGK and its Group companies (including executives, employees, employees temporarily assigned to outside companies, advisors, contract employees, temporary employees hired on a worker dispatch agreement, and subcontractor local employees) can utilize.

As a rule, actual names are used for consultations and reports, but outside contact points can be utilized for anonymous consultations. Those seeking advice or reporting issues are promised protection under corporate rules.

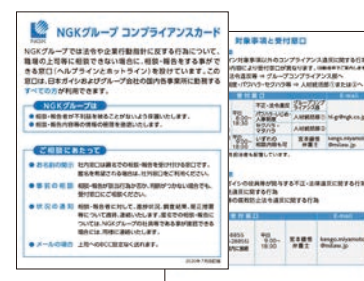
In addition, we are planning to update and improve our corporate rules and whistleblowing system to coincide with the enactment of the Revised Whistleblower Protection Act in Japan.

Organization of Whistleblowing System



Compliance Card

For thorough awareness of the whistleblowing system, we created a carry-size Compliance Card and distributed it to all employees at NGK and all Group companies in Japan.



Observing Competition Laws and Other Laws and Regulations Pertaining to Business Transactions

In addition to mandating compliance with competition laws in the NGK Group Code of Conduct, we have established the Competition Laws Compliance Rules, set forth to comply with international standards, which are strictly enforced by the NGK Group both in Japan and its overseas locations. We have established these policies and procedures in order to eradicate unfair business practices 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 the Competition Laws Compliance Rules and the Competition Laws Compliance Handbook, and we have established the Competition Laws Compliance Activities Portal Site, which contains practical instruction manuals for complying with competition laws. The Competition Laws Compliance Handbook will be revised and updated in response to changes in the social environment.

At the same time, since fiscal 2015, we have contracted PwC Advisory LLC (hereinafter, "PwC") as our independent compliance professional. PwC is engaged to annually review the implementation status of the NGK Group's competition law compliance program per the Competition Laws Compliance Rules as well as assessing the overall oversight and reporting structures in place for NGK Group companies, both in Japan and overseas locations. On top of this, starting in fiscal 2017, PwC has also conducted interviews with the directors overseeing NGK's various business groups in order to: 1) assess the tone of each director's approach toward competition law compliance; and 2) to further enhance their awareness of these efforts. The results of these reviews are being leveraged for a variety of purposes, such as operating and improving the competition law compliance program.

Reference
URL

Plea Agreement with U.S. Department of Justice concerning ceramic substrates for catalytic converters
https://www.ngk-insulators.com/en/news/20150904_9235.html

Strengthening Our Compliance System Related to Competition Laws

Year conducted	Regulation development	Creation of internal systems	Training
FY1997	<ul style="list-style-type: none"> Formulated guidebook and briefing document for the Anti-Monopoly Act 	<ul style="list-style-type: none"> Required each business group to submit a Compliance Status Report on the Anti-Monopoly Act 	<ul style="list-style-type: none"> Lectures on the Anti-Monopoly Act by outside instructors (attorneys) (subsequently held annually)
FY2011	<ul style="list-style-type: none"> Formulated Competition Laws Compliance Rules 		
FY2012	<ul style="list-style-type: none"> Created and distributed the Competition Laws Compliance Handbook Created and distributed an Appendix to the Competition Laws Compliance Handbook 	<ul style="list-style-type: none"> Established an independent committee 	<ul style="list-style-type: none"> In-house training led by legal department staff Lectures by local attorneys held at Group companies outside Japan
FY2013			<ul style="list-style-type: none"> Conducted briefing on the Competition Laws Compliance Handbook Invited U.S. attorneys to lecture on competition laws
FY2014	<ul style="list-style-type: none"> Revised Competition Laws Compliance Rules Launched operation of a database for advanced notifications and participation reports pertaining to meetings Launched operation of an e-mail monitoring system Revised Competition Laws Compliance Rules at North American sales subsidiaries 	<ul style="list-style-type: none"> Introduced company-wide centralized supervision and reporting structures led by the Board of Directors (independent of the President) Appointed company-wide competition laws supervisory managers Enhanced the helpline 	<ul style="list-style-type: none"> Conducted study meetings for newly appointed directors on competition laws and the Companies Act by Japanese and U.S. attorneys (subsequently held annually) Conducted study meetings on competition laws at Group companies outside Japan (corresponding to laws and regulations in each country)
FY2015	<ul style="list-style-type: none"> Competition Laws Compliance Rules of all NGK Group companies in and outside Japan were revised to ensure that the NGK Group's compliance system meets global standards Revised the Competition Laws Compliance Handbook 	<ul style="list-style-type: none"> The Competition Laws Compliance Program was resolved by the Board of Directors Established the Global Compliance Office Contracted Pricewaterhouse Coopers to review the implementation status of the NGK Group's competition law compliance program and assess the overall oversight and reporting structures in place for NGK Group companies 	<ul style="list-style-type: none"> Conducted study meetings on competition laws for new employees Distributed a DVD on competition laws to Group companies in Japan Upgraded training on compliance with competition laws provided in and outside Japan
FY2016	<ul style="list-style-type: none"> The U.S. version and Chinese version of the Competition Laws Compliance Handbook were created and distributed to Group companies in the U.S. and China, respectively 	<ul style="list-style-type: none"> Progress status of the competition law compliance program was quarterly reported to the Business Ethics Committee, which is composed mainly of external directors. The program was promoted based on suggestions received from the Committee. Retained PwC Advisory to assess the status of competition law compliance 	<ul style="list-style-type: none"> Expanded seminars led by attorneys in Asia Held seminars on the Companies Act and competition laws for newly appointed executive officers Prepared online-based training aimed at realizing broader training programs (Implemented in fiscal 2017 in Japan)
FY2017	<ul style="list-style-type: none"> Operating manual for database used to document competition law compliance underwent maintenance and updating 	<ul style="list-style-type: none"> Top management of headquarters, business groups, and Group companies provided notifications about compliance with competition laws at beginning of term 	<ul style="list-style-type: none"> Online seminars provided to 861 employees in Japan
FY2018	<ul style="list-style-type: none"> Clarified items that should be reported to the hotline when there were violations or fear of violation of competition laws, and revised Competition Laws Compliance Rules Created a working manual for compliance with competition laws 	<ul style="list-style-type: none"> Top management of headquarters, business groups, and Group companies provided notifications about compliance with competition laws at beginning of term 	<ul style="list-style-type: none"> Held seminars on the Companies Act and competition laws for newly appointed directors and executive officers Held competition law compliance lectures. All executives and managers attended
FY2019	<ul style="list-style-type: none"> Revised Competition Laws Compliance Rules at NGK Electronics Devices, Inc. to strengthen that subsidiary's competition laws compliance system 	<ul style="list-style-type: none"> Top management of headquarters, business groups, and Group companies provided notifications about compliance with competition laws at beginning of term 	<ul style="list-style-type: none"> Held seminars on the Companies Act and competition laws for newly appointed executive officers Held competition law compliance lectures. All managers and those designated by competition law compliance managers attended. Information session provided regarding the Competition Laws Compliance Handbook's key points (on competitor information when creating email and documentation)
FY2020	<ul style="list-style-type: none"> Established the Competition Laws Compliance Activities Portal Site 	<ul style="list-style-type: none"> Top management of headquarters, business groups, and Group companies provided notifications about compliance with competition laws 	<ul style="list-style-type: none"> Held seminars on the Companies Act and competition laws for newly appointed directors and executive officers Held competition laws compliance lectures attended by executives, all managers, and those designated by competition law compliance managers

Note: Items in blue continue every year

Strict Adherence to Laws and Regulations Relating to Export Management

As part of its full compliance efforts, NGK is engaged in strictly observing and enforcing laws and regulations related to import and export control. Based on the NGK Group Code of Conduct, we stipulate abidance with laws and regulations related to secure export control, and we carry out export control and employee training in accordance with internal rules and the Export/Import Handbook.

Using Databases to Conduct Comprehensive Inspections and Customs Management

In response to the Foreign Exchange and Foreign Trade Act and other export control-related laws and regulations, NGK has screened exports to determine whether export licenses are required and has recorded screening results in a security export control database. However, since October 16, 2017, we have moved to a security export control system (TPP) and are performing management via this new system. Furthermore, export management with respect to the export of certain products is conducted under the Japanese government's AEO (authorized economic operator) Program.

We have used an export/import cargo management ledger to fulfill our obligations to track and record imports and exports; however, since our switch to a security export control system (TPP), we have been using the system's shipment ledger to track and record exports. We continue to use an import cargo control ledger for imports. Each department performs voluntary inspections of imports and exports under the AEO Program at the start of the fiscal year.

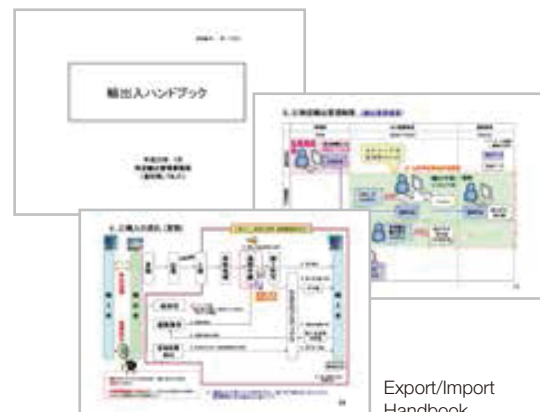
In addition, we use NACCS data (Nippon Automated Cargo and Port Consolidated System) to verify the completeness of export/import cargo management ledgers and shipment ledgers. We have achieved nearly 100% completeness for both imports and exports.

Familiarization with the Export/Import Handbook

NGK also makes efforts toward thorough compliance with the Export/Import Handbook, which was published in fiscal 2012 and summarizes items for the observance of export/import customs clearance regulations.

In addition to publishing this handbook on the company intranet where it can be viewed throughout the entire company, we provide training to spread awareness of the content of the handbook through study meetings related to export/import management conducted in each business division.

Study meetings on the AEO Program and export/import management are held one or more times per year targeting relevant staff in divisions responsible for export and import activities. In fiscal 2020, these meetings were held 12 times, with 205 employees in attendance.



Export/Import Handbook

Anti-Competitive Behavior Incidents

In fiscal 2020, there were no confirmed incidents of anti-competitive behavior in the NGK Group.

Corruption and Bribery Incidents

In fiscal 2020, there were no confirmed incidents of corruption or bribery in the NGK Group.

Non-Compliance Incident Reports

In fiscal 2020, there were no incidents of serious legal non-compliance in the NGK Group.

Compliance Education for Employees

Compliance training and awareness among corporate officers and employees is driven primarily by the Group Compliance Department and the Legal Department. In addition to career training and training for employees to be posted overseas, we provide Laws and Compliance Seminars to explain laws and regulations and to introduce case studies.

Since fiscal 2018, we have included quality compliance and contract observance as part of our career education courses.

Compliance Education Conducted in Fiscal 2020 (Overall)

Name	Target	Content	Instruction format	Number of sessions
Career education	New hires (regular-position employees)	Compliance basics, competition laws, anti-bribery regulations	Training by an in-house instructor	1
	New hires (engineering staff)	Compliance basics, competition laws, anti-bribery regulations	Video presentation	1
	Promoted or career-changed employees	Compliance basics	Video presentation	1
	Mid-career hires	Compliance basics, competition laws, anti-bribery regulations	Video presentation	1
	Newly appointed supervisors	General compliance, competition laws, anti-bribery regulations, quality compliance, contract observance, security export control	Video presentation	1
	Newly appointed managers	General compliance, competition laws, anti-bribery regulations, quality compliance, contract observance, security export control	Video presentation	1
	Managers promoted second grade	Compliance (including quality compliance)	Video presentation	1
Training for employees scheduled for postings abroad (global training)	Employees scheduled for postings abroad	Competition laws, anti-bribery regulations, security export control	Video presentation	3
Compliance education	Managers and sales staff of Group companies outside Japan	Compliance basics, competition laws, anti-bribery regulations	Lectures provided by attorneys and paper materials-based in-house training	19 (24 bases)
	General employees of NGK and Group companies in Japan	Compliance, harassment prevention, whistleblowing system	Video presentation	1
	Sales staff of NGK and Group companies in Japan	Anti-bribery rules for dealing with foreign public officials	Attorney-led seminar	4
	Executive officers	Competition laws	Self-study using paper-based resources; attorney-led seminar	2
	Newly appointed executive officers	Companies act and competition laws	Attorney-led seminar	1
	Managers and sales staff of NGK and Group companies in Japan	Competition laws	Video presentation	1
Laws and compliance seminars	Managers and other targets depending on content	July Happy Living – Protecting yourself from traffic accidents, crime and criminal groups –	Video presentation	1
		September Latest trends in insider trading regulations	Video presentation	1
		Force Majeure Clause	Video presentation	1
		January Latest Trends in Anti-Bribery Regulations	Attorney-led seminar	1
		March Anti-Monopoly Act Revisions for 2019	Video presentation	1
Other training	Directors and managers of NGK and Group companies in Japan	Quality compliance seminar “Building a quality-focused organizational culture”	Seminar by an outside instructor	1
	Divisions and Group companies in Japan	Competition laws, anti-bribery regulations, Subcontract Act	Training by an in-house instructor	7

Competition Law Education Conducted in Fiscal 2020

Name	Target	Content	Number of sessions
Training for newly appointed directors	Newly appointed directors and executive officers	Outside attorney-led live seminar	1
Competition law compliance lectures	All directors and managers, and sales staff of NGK and its Group companies in Japan	Streamed video of outside attorney-led live seminar	2
Compliance training for Group companies outside Japan	Managers and sales staff of Group companies outside Japan	Attorney-led live seminar and online seminar; seminar conducted by an internal lecturer; conducted using paper-based resources	19 (24 bases)
On-demand training on competition laws by internal lecturer	Targets depending on content	Division-requested on-site training; training by legal department staff	6

Anti-Bribery Training Conducted in Fiscal 2020

Name	Target	Content	Number of sessions
Training for sales staff	Sales staff in Japan Heads of Group companies outside Japan (some)	Anti-bribery rules for dealing with foreign public officials	4
Compliance education	Managers and sales staff at Group companies outside Japan	Attorney-led live seminar and online seminar; seminar conducted by an internal lecturer; conducted using paper-based resources	19 (24 bases)

Other Dissemination Activities

We post the Compliance Newsletter on the company's intranet once a month. The Newsletter features a four-frame cartoon that explores familiar themes followed by detailed explanations of what we can learn from these examples.

In fiscal 2017, we began making October the annual compliance strengthening month, during which we do things such as put up educational posters and through employees of whistleblowing system.

Themes Covered in the Compliance Newsletter in FY2020

April	Anonymous consultations	October	Compliance strengthening month
May	Personal use of workplace PC	November	Outsourcing of personal information management
June	Lost mobile phone issued for work	December	Human rights week
July	Environmental protection activities	January	Safe and enjoyable work environment
August	Confidential conversations	February	Harassment prevention
September	Differences in nationality or culture	March	Contract compliance



Note: Provided by "Compro Custom" compliance training tools service

Compliance Surveys

We conduct a Corporate Risk Survey (CRS)* within the NGK Group once every two years to gauge compliance and business risk-related awareness among employees.

In fiscal 2020, we continued working to address the risks identified from the survey results in fiscal 2019, such as by providing training in identifying actual compliance violations and how to prevent them. In addition, individual business groups and other organizations within the NGK Group conduct their own surveys and use the results to propose and implement measures each fiscal year.

For the CRS in fiscal 2021, we plan to expand the scope to some of our Group companies outside Japan and collect local employee responses as well.

* CRS respondents

- 1) Compliance awareness survey – Japan: Directors and employees, including those who are temporary or part-time / Overseas: Employees dispatched overseas
- 2) Business risks – Japan: Assistant manager and supervisor class or higher

Customer Relationship Management

Basic Approach

One of the focuses of the NGK Group Code of Conduct is to contribute to the “Realization of a Sustainable Society” through the products and services that we provide to customers, and towards that end we have resolved to do the following.

Realization of a Sustainable Society



- **We will create new value through the provision of products and services that contribute to society, protect the world environment, and strive to realize a sustainable society.**
 - By providing high quality products and services in which safety is properly considered and which comply with environmental rules, we can respond to the trust of customers and society.
 - We will sincerely consider new needs and the desire for improvements from customers and society and undertake product and service development and upgrades.

Customer Satisfaction Survey

In order to reflect customer feedback in our products and services, each of NGK's business groups independently develops and conducts surveys aimed at facilitating greater customer satisfaction.

Results of the Ceramic Products Business Group's Customer Satisfaction Survey

2017	2018	2019	2020
91%	94%	100%	100%

Note: Calculation method

Participants were asked to respond to survey questions by providing a rating from one to ten, with responses of six or higher counting as “Satisfied.”

Impact on Policy

Donations and Other Spending

The NGK Group conforms to all applicable laws with regard to political contributions; this includes abiding by legal prohibitions against political contributions to individual politicians and ensuring that contributions to specific political organizations and parties do not exceed legally stipulated limits.

In fiscal 2020, the NGK Group had no political contribution expenditures.

Policy on Cross-Shareholdings

NGK holds shares of listed companies that contribute to the NGK Group's long-term business development as cross-shareholdings, primarily in order to maintain and strengthen business relationships. In addition, NGK holds the shares of each company in the Morimura Group, which was established by the same founders of NGK, for the mutual benefit of enhancing management quality, as the Morimura Group brand forms a part of NGK's corporate value through its philosophy and heritage. As all cross-shareholdings are a part of the asset portfolio, they are positioned as assets to supplement the amount of liquidity considered necessary in the business plan. NGK constantly strives to reduce the scale of cross-shareholdings from the perspective of capital efficiency. Furthermore, the scale of cross-shareholdings may fluctuate due to factors including changes in overall business trends and risks, financial conditions, and the status of NGK's business relationship with each business partner. Regarding the specific stocks held, at its Board of Directors' meeting, NGK regularly reviews the appropriateness of the continuous holding of shares as cross-shareholdings along with the capital policy, by determining the significance of holding from the business relationship, the safety of ratings and so forth, and the efficiency of dividend yields and so forth. On the other hand, when comparing cross-shareholdings to NGK's cost of capital, evaluations based solely on shares are not conducted. Instead, ROIC management is conducted for each business with differing risks and expected returns, and cross-shareholdings are evaluated after being included in each business's balance sheet. After verification, in fiscal 2020, four specified equity securities held for investment purposes were sold for a total of 2.033 billion yen.

Number of Stocks and Balance Sheet Amount

	Number of stocks	Total balance sheet amount (millions of yen)
Unlisted shares	37	2,019
Shares other than unlisted shares	40	41,258

Stocks for Which Number of Shares Increased in FY2020

	Number of stocks	Share number increase total acquisition amount (millions of yen)	Reason for share number increase
Unlisted shares	—	—	—
Shares other than unlisted shares	1	378	Due to change in classification from shares of affiliated companies as a result of a decrease in investment ratio.

Stocks for Which Number of Shares Decreased in FY2020

	Number of stocks	Share number decrease total sale amount (millions of yen)
Unlisted shares	1	7
Shares other than unlisted shares	4	2,033

Supply Chain Management

Basic Approach

In line with a basic policy centered on the three principles of openness and fairness, partnership, and relationship with society, the NGK Group has established the Basic Purchasing Policy in order to promote fair and honest business transactions, as well as to help ensure prosperous relationships, with the procurement partners in our supply chain.

▶ P133 Communication Activities with Procurement Partners

Supply Chain Management System

At NGK, the Purchasing Department is responsible for managing tier 1 suppliers. It also manages tier 2 and beyond suppliers that provide critical items such as raw materials. All supplier management is done in line with NGK's Supplier Management Regulations.

Basic Purchasing Policy

Open and Fair

- Open, fair, and honest procurement
- Pursuit of competition principles and profitability

Partnership

- Mutual prosperity based on mutual trust with suppliers

Relationship with Society

- Compliance with laws
- Preservation of the global environment

Familiarization of the Purchasing Handbook

Purchasing operations are directly related to various important aspects of corporate management, such as assets, production, development, and business performance, and also involve external and financial activities, major areas prone to compliance issues. In light of this, we created the Purchasing Handbook to summarize internal rules for purchasing engagement and issued the first edition of it in fiscal 2007. The Handbook has since been reviewed every year.

Efforts have also been made to better familiarize personnel with the tool: it has been made available on the company intranet and its significant objectives are discussed in company training programs, particularly for new managers.



Introduction of General Indirect Materials Purchasing System

Typically, each division has performed general indirect materials purchasing, using an off-line, piecemeal approach; however, in order to centrally integrate indirect materials spending and make it more transparent, we have introduced a global transaction network system.

This system is being launched in fiscal 2021, and we are making preparations to progressively expand its scope of application.

CSR Procurement

In response to the rising social expectation for CSR-oriented supply chain management, the NGK Group promotes CSR procurement. We preferentially select CSR-conscious companies and purchase CSR-sensitive raw-materials and services.

CSR Procurement Guidelines

The NGK Group created the CSR Procurement Guidelines in fiscal 2010 as a guide to promote CSR procurement across the Group. The Guidelines specifically describe our obligations as a socially responsible buyer as well as our requirements for socially responsible suppliers, such as specifying environmental obligations like greenhouse gas emissions reductions.

In fiscal 2013, the Guidelines were expanded by being integrated with the previous Green Procurement Guidelines, which set forth rules for preferential purchase of environmentally friendly products and services, and adding provisions of conflict minerals, anti-corruption, human rights, and labor issues.

The expanded CSR Procurement Guidelines are publicly available on our website in multiple languages (Japanese, English, and Chinese).

CSR Procurement Guideline adoption rate
for business partners

99.6%

Reference
URL

CSR Procurement Guidelines and
Supplemental Materials

<https://www.ngk-insulators.com/en/info/procure/>

Supply Chain Evaluation

Within NGK, raw materials and molding molds for main production items are considered critical items, and of the suppliers who supply these items to NGK, 38 companies (22 Tier 1 companies, 16 Tier 2 companies) are considered critical suppliers from a transaction volume, and BCP standpoint.

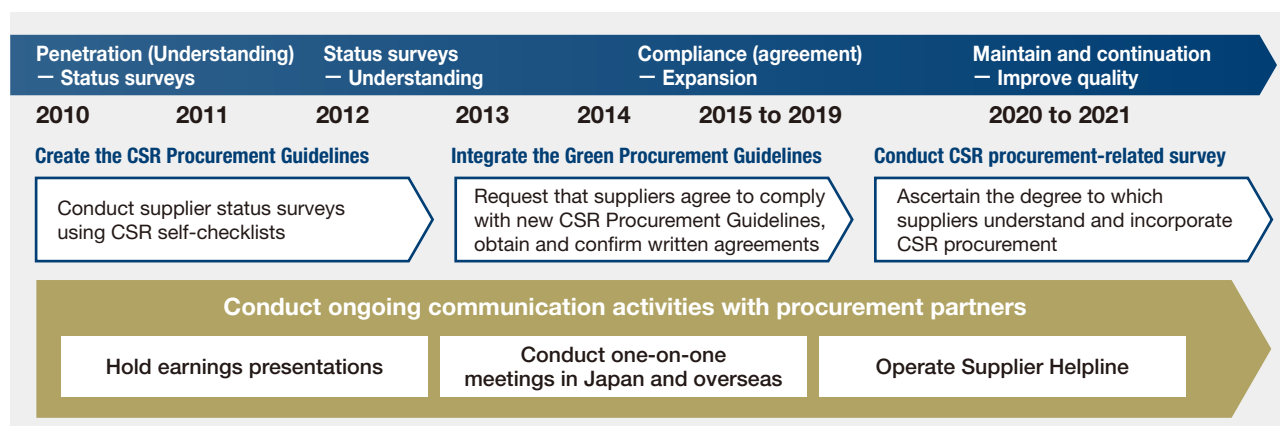
In order to identify sustainability-related risks in the supply chain, which includes these suppliers, we perform partner maintenance and selection based on the CSR Procurement Guidelines, as well as visit suppliers to identify who are our high-risk procurement partners.

Improving CSR Procurement

At the NGK Group, we develop activities to promote CSR procurement, such as visiting individual suppliers and conducting on-site inspections. We also request our suppliers, particularly new companies, to sign an agreement to comply with the CSR Procurement Guidelines.

We will conduct a survey over the course of 2020 to 2021 in order to ascertain the degree to which suppliers understand and incorporate CSR procurement; to determine what CSR procurement initiatives are in place, and their status, at each supplier; and to provide support with improvement, which is appropriate to the relative criticality of each supplier.

Ongoing Promotion of CSR Procurement



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.

* Minerals including tin, tantalum, tungsten, and gold produced in the Democratic Republic of the Congo and surrounding countries, and used as a source of funding for armed conflict in the area.

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.



At the NGK Group Purchasing Liaison Meeting

Communication Activities with Procurement Partners

Distribution of Earnings Explanation and Materials Procurement Policy Resources to Suppliers

Because of the COVID-19 pandemic, NGK's annual earnings presentation for suppliers was canceled. Instead, earnings explanation and materials procurement policy explanation resources were distributed to around 130 companies, along with an introduction to NGK's initiatives for maintaining ongoing communications.

Ongoing Operation of the Supplier Helpline

In 2008, NGK established the supplier helpline system. Receiving consultation via e-mail, fax, and telephone, we make an effort to respond with solutions quickly.

Reference URL	Supplier Helpline https://www.ngk-insulators.com/en/info/procure/
------------------	---

Visiting 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, evaluating their QCD (quality, cost, and delivery) performance in a fair and equitable manner. In fiscal 2020, we conducted audits of 28 existing suppliers, with some being carried out online due to the COVID-19 pandemic.

Through these activities, we strive to strengthen our QCD management system as well as to communicate with our suppliers to forge a relationship of mutual trust.

Supplier Training-Driven Support Efforts

The NGK Safety Cooperation Conference hosts meetings for facilities and equipment construction-related supplier members. These meetings are used as opportunities to share accident and disaster case studies, as well as to provide safety-related lectures.

The fiscal 2020 meeting was attended by around 20 people from NGK and 88 people from 74 conference member companies. The keynote address was on the topic of communication focused on on-site accident prevention.

Monitoring Activities Aimed at Suppliers outside Japan

We systematically undertake quality audits of our suppliers outside Japan.

Information Security

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 Center, in conjunction with other relevant administrative divisions and in line with the Basic NGK Group Information Security Policy.

Every employee who uses computer or other information-processing devices as part of their job is provided with our Electronic Information Security Handbook and is encouraged in the proper use of their devices, as well as made aware of the need to contact the General Affairs Department and ICT Center 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 Center visit several Group companies each year to conduct on-site checks and provide guidance on their implementation of IT security measures. In fiscal 2020, due to the impact of the global COVID-19 pandemic, these visits to overseas Group companies were not carried out; however, online sessions were held with 12 Group companies in order to share with them the IT security enhancement policies and measures implemented by the Head Office, and a survey was conducted to ascertain the state of IT security-related device maintenance and operations at each company.

In order to further encourage IT security-related initiatives, a clearly defined committee body is scheduled to be established in fiscal 2021 to discuss related issues and measures.

Reference
URL

Basic NGK Group Information Security Policy
<https://www.ngk-insulators.com/en/info/policies/>

Formulation of 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, thus in fiscal 2010 we formulated the NGK Group IT Security Standards with the goal of developing an IT security structure based on commonly shared Group standards and enhancing IT security.

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

Information Security Training

Training sessions are conducted throughout the year to ensure strict adherence to information security among all employees.

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

Item	Number of participants	Participation rate
Training for newly hired employees	147	100%
Training for newly promoted supervisors	118	100%
Training for newly promoted managers	55	100%
E-learning	5,320	100%

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

Ensure IT Security Against Cyberattacks

The NGK Group has built systems for protecting against and detecting cyberattacks. We are making the necessary capital investment and infrastructure upgrades so as to further strengthen the systems' detection functions in fiscal 2021. We plan to carry out the necessary document enhancement and structural reinforcement to ensure we are prepared to deal with an IT security incident and can restore our IT systems. Following completion, annual training is planned that will teach employees how to handle IT security incidents.

Privacy Policy and Organization for Personal Information Protection

The NGK Group has established internal rules in an effort to ensure strict handling and management of personal information obtained from customers. In fiscal 2015, NGK formulated and published our Basic Policy on the Proper Handling of Specific Personal Information in response to the enforcement of the Act on the Use of Numbers to Identify a Specific Individual in Administrative Procedures. Moreover, our policies are in full compliance with the revised Act on the Protection of Personal Information, which came into effect on May 30, 2017.

Reference
URL

Privacy Policy

<https://www.ngk-global.com/privacypolicy/ngk-and-group-companies.html>

Innovation Management

R&D Expenses

NGK Group R&D Expenses

	FY2016	FY2017	FY2018	FY2019	FY2020
R&D expenses (in millions of yen)	18,653	21,100	23,271	22,928	22,448
R&D expenses as a percentage of net sales (%)	4.6	4.7	5.0	5.2	5.0

Open Innovation

The NGK Group uses open innovation as a means of facilitating collaborative new product development. We pursue open innovation through a variety of approaches, including joint development with outside partners, participation in demonstration testing carried out within the framework of bilateral national agreements, and obtaining unique technologies via acquisition of shares in other companies.

Examples of Open Innovation Initiatives

Efficiency improvement, cost reduction, sales creation

Contact with human resources, technology, and inventions; other positive results

Three Different Approaches

Collaboration with overseas partners (subnano-ceramic membranes)

Demonstration testing carried out within the framework of bilateral national agreements (NAS[®] batteries)

Process Innovation

Within the NGK Group we undertake process innovation through a variety of approaches, including direct interlinkage of processes, process automation, and manufacturing method innovation. In fiscal 2020, our process innovation efforts contributed to an approximately 4% reduction in the cost of sales.

Emerging Markets Strategy

The following is the percentage of NGK Group sales coming from emerging markets*.

	FY2017	FY2018	FY2019	FY2020
Percentage of sales	27%	25%	24%	31%

The following is the percentage of NGK Group employees in emerging markets*.

	FY2017	FY2018	FY2019	FY2020
Percentage of employees	30%	28%	27%	23%

* Emerging markets are defined as all markets outside of Japan, North and Central America, and Europe.

Production Measures for Emerging Markets

In the NGK Group, we work to ensure that all of our overseas production bases operate in accordance with the NGK Group Code of Conduct and obtain ISO 9001 or IATF 16949 certification, as well as carry out quality assurance, quality control, quality improvement, quality-related training, and other activities. In fiscal 2020, NGK Ceramics (Thailand) Co., Ltd. obtained IATF 16949 certification, and now all production bases are certified. We are working now to secure certification within three years of new sites, including those in emerging markets.

Acquisition of ISO 9001 or IATF 16949 Certification

	FY2016	FY2017	FY2018	FY2019	FY2020
Percentage of ISO 9001 certified sites (% Group)	100	97	97	97	100

GRI Content Index

102 GENERAL DISCLOSURES

		Page
GRI 102: General Disclosures 2016		
1 Organizational profile		
102-1	Name of the organization	• Corporate Outline (P148)
102-2	Activities, brands, products, and services	• Creating Value (P2-3)
102-3	Location of headquarters	• Corporate Outline (P148)
102-4	Location of operations	• Corporate Outline (P148)
102-5	Ownership and legal form	• Corporate Outline (P148)
102-6	Markets served	• Corporate Outline (P148) • Annual Securities Report, Overview of Business (P5) (Japanese)
102-7	Scale of the organization	• Corporate Outline (P148) • Creating Value (P2-3) • Annual Securities Report, Financial Highlights (P2-3) (Japanese)
102-8	Information on employees and other workers	• Employee Basic Data (P63-64)
102-9	Supply chain	• Supply Chain Evaluation (P131)
102-10	Significant changes to the organization and its supply chain	NA
102-11	Precautionary principle or approach	• ESG Management (P14-15) • NGK Group Environmental Vision (P18-19) • Environmental Risk Management (P26-27) • Risk Management (P113-115)
102-12	External initiatives	• NGK Group Signs UN Global Compact (P15) • Position on SDGs (P15) • NGK Endorses TCFD (P31) • Activities for Achieving the Aichi Targets (P39)
102-13	Membership of associations	• NGK Group Signs UN Global Compact (P15) • NGK Endorses TCFD (P31)
2 Strategy		
102-14	Statement from senior decision-maker	• Message from the President (P4-9)
102-15	Key impacts, risks, and opportunities	• Creating Value (P2-3) • ESG Management (P14-15) • Values Provided by the NGK Group (P16) • NGK Group Environmental Vision (P18-19) • Materiality (P112) • Risk Management (P113-115)
3 Ethics and Integrity		
102-16	Values, principles, standards, and norms of behavior	• NGK Group Philosophy (P1) • ESG Management (P14-15) • NGK Group Environmental Vision (P18-19) • NGK Group Code of Conduct (P119-120) • Scope of Application (P121)
102-17	Mechanisms for advice and concerns about ethics	• Whistleblowing System (P122-123)
4 Governance		
102-18	Governance structure	• Corporate Governance System (P95)
102-19	Delegating authority	• Environmental Management Promotion System (P21) • Corporate Governance System (P95)

102-20	Executive-level responsibility for economic, environmental, and social topics	<ul style="list-style-type: none"> • ESG Management (P14-15) • Environmental Management Promotion System (P21) • Corporate Governance System (P95)
102-21	Consulting stakeholders on economic, environmental, and social topics	<ul style="list-style-type: none"> • Environmental Management Promotion System (P21) • Basic Policies (P94) • Corporate Governance System (P95)
102-22	Composition of the highest governance body and its committees	<ul style="list-style-type: none"> • Board of Directors, Audit & Supervisory Board, Executive Officers (P100-103) • Annual Securities Report, Status of Officers (P74-79) (Japanese)
102-23	Chair of the highest governance body	<ul style="list-style-type: none"> • Committees on Corporate Governance (P96) • Annual Securities Report, Overview of Corporate Governance (P65) (Japanese)
102-24	Nominating and selecting the highest governance body	<ul style="list-style-type: none"> • Election of Board Members, Executive Officers, and Audit & Supervisory Board Members (P106) • Corporate Governance Report, Views on the Balance Between Knowledge, Experience, and Skills of the Board of Directors as a Whole, and Diversity and Size of the Board (P5) • Corporate Governance Report, Matters Concerning Functions of Business Execution, Audit and Supervision, Nomination, Determination of Remuneration, etc. (P21)
102-25	Conflicts of interest	<ul style="list-style-type: none"> • Board of Directors, Audit & Supervisory Board, Executive Officers (P100-103) • Standard and Policy for Independence of Outside Directors and Outside Audit & Supervisory Board Members (P104) • Reasons for Appointment of Outside Directors and Outside Audit & Supervisory Board Members (P105) • Election of Board Members, Executive Officers, and Audit & Supervisory Board Members (P106)
102-26	Role of highest governance body in setting purpose, values, and strategy	<ul style="list-style-type: none"> • ESG Action Framework (P14) • Managing the Risks from Climate Change (P31) • Corporate Governance System (P95) • Materiality (P112) • Risk Identification Process (P113)
102-27	Collective knowledge of highest governance body	<ul style="list-style-type: none"> • Fiscal 2020 ESG Committee Achievements (P15) • Expertise of Directors (P102)
102-28	Evaluating the highest governance body's performance	<ul style="list-style-type: none"> • Evaluation on the Effectiveness of the Board of Directors (P106)
102-29	Identifying and managing economic, environmental, and social impacts	<ul style="list-style-type: none"> • ESG Management (P14-15) • Evaluation on the Effectiveness of the Board of Directors (P106)
102-30	Effectiveness of risk management processes	<ul style="list-style-type: none"> • Risk Management (P113-115)
102-31	Review of economic, environmental, and social topics	<ul style="list-style-type: none"> • Corporate Governance System (P95)
102-32	Highest governance body's role in sustainability reporting	
102-33	Communicating critical concerns	<ul style="list-style-type: none"> • Risk Management (P113-115)
102-34	Nature and total number of critical concerns	
102-35	Remuneration policies	<ul style="list-style-type: none"> • Policies for Determining Remuneration of Directors (P107-108)
102-36	Process for determining remuneration	<ul style="list-style-type: none"> • Policies for Determining Remuneration of Directors (P107-108)
102-37	Stakeholders' involvement in remuneration	<ul style="list-style-type: none"> • Annual Securities Report, Resolutions at General Meetings of Shareholders on Remuneration for Officers and Other Matter (P84) (Japanese)
102-38	Annual total compensation ratio	<ul style="list-style-type: none"> • Disclosure of Average All Employee Remuneration and CEO Remuneration (P108)
102-39	Percentage increase in annual total compensation ratio	
5 Stakeholder Engagement		
102-40	List of stakeholder groups	<ul style="list-style-type: none"> • Communication with Stakeholders (P49-50)
102-41	Collective bargaining agreements	<ul style="list-style-type: none"> • Freedom of Association (P70) • Annual Securities Report, Overview of Employees (P11) (Japanese)

102-42	Identifying and selecting stakeholders	<ul style="list-style-type: none"> • Communication with Stakeholders (P49-50)
102-43	Approach to stakeholder engagement	<ul style="list-style-type: none"> • Communication with Stakeholders (P49-50)
102-44	Key topics and concerns raised	<ul style="list-style-type: none"> • Communication Activities with Procurement Partners (P133)
6 Reporting Practice		
102-45	Entities included in the consolidated financial statements	<ul style="list-style-type: none"> • Corporate Outline (P148)
102-46	Defining report content and topic boundaries	
102-47	List of material topics	<ul style="list-style-type: none"> • Key ESG Action Themes (P15) • Materiality (P112)
102-48	Restatements of information	NA
102-49	Changes in reporting	<ul style="list-style-type: none"> • Key ESG Action Themes (P15) • Materiality (P112)
102-50	Reporting period	<ul style="list-style-type: none"> • Target Period (P151)
102-51	Date of most recent report	<ul style="list-style-type: none"> • NGK Report Archive https://www.ngk-insulators.com/en/sustainability/backnumber.html
102-52	Reporting cycle	<ul style="list-style-type: none"> • NGK Report Archive https://www.ngk-insulators.com/en/sustainability/backnumber.html
102-53	Contact point for questions regarding the report	<ul style="list-style-type: none"> • For inquiries about this report (Back cover) • Inquiries about sustainability https://www.ngk-insulators.com/en/contact/?code=NGKGREN006&kind=NGKFMEN022
102-54	Claims of reporting in accordance with the GRI Standards	
102-55	GRI content index	<ul style="list-style-type: none"> • GRI Content Index (P138-145)
102-56	External assurance	<ul style="list-style-type: none"> • Independent Practitioner's Assurance (P150)

103 Management Approach

GRI 103: Management Approach 2016		
103-1	Explanation of the material topic and its boundary	<ul style="list-style-type: none"> • Key ESG Action Themes (P15) • Materiality (P112)
103-2	The management approach and its components	<ul style="list-style-type: none"> • ESG Management (P14-15) • NGK Group Environmental Vision (P18) • Environmental Report / NGK's Core Policy on the Environment (P20) • Five-Year Environmental Action Plan (P23) • Environmental Risk Management (P26) • Climate Strategy / Initiatives Toward Carbon Neutrality (P31) • Initiatives for a Recycling-Oriented Society (P37) • Initiatives Toward Harmony with Nature (P39) • Communication with Stakeholders (P49) • Human Rights (P51) • Quality Activity (P56) • Employees (P62) • Human Resource Development (P71) • Occupational Safety and Health (P76) • Health Management (P80) • Work-Life Balance (P83) • Social Contribution Activity (P87) • Corporate Governance (P94) • Risk Management (P113) • Business Code of Conduct (P119) • Supply Chain Management (P130) • Information Security (P134)
103-3	Evaluation of the management approach	<ul style="list-style-type: none"> • Results of the Fourth Five-Year Environmental Action Plan (P25)

200 Economic

GRI 201: Economic Performance 2016		
201-1	Direct economic value generated and distributed	<ul style="list-style-type: none"> Annual Securities Report, Corporate Overview (P2) (Japanese)
201-2	Financial implications and other risks and opportunities due to climate change	<ul style="list-style-type: none"> Creating Value (P2-3) Climate Change Strategy (P31) Risk Management of Water Resources and Response (P38) Risks, Risk Summaries, Risk Responses (P114)
201-3	Defined benefit plan obligations and other retirement plans	<ul style="list-style-type: none"> Annual Securities Report, Defined Benefit System (P125-127) (Japanese)
201-4	Financial assistance received from government	<ul style="list-style-type: none"> Annual Securities Report, Consolidated Income Statement (P96) (Japanese)
GRI 202: Market Presence 2016		
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	
202-2	Proportion of senior management hired from the local community	
GRI 203: Indirect Economic Impacts 2016		
203-1	Infrastructure investments and services supported	<ul style="list-style-type: none"> Creating Value (P2-3) NGK Report 2021, At a Glance (P67)
203-2	Significant indirect economic impacts	
GRI 204: Procurement Practices 2016		
204-1	Proportion of spending on local suppliers	
GRI 205: Anti-corruption 2016		
205-1	Operations assessed for risks related to corruption	
205-2	Communication and training about anti-corruption policies and procedures	<ul style="list-style-type: none"> Compliance Education for Employees (P126) Corruption Prevention Structure (P122) Observing Competition Laws and Other Laws and Regulations Pertaining to Business Transactions (P123-124)
205-3	Confirmed incidents of corruption and actions taken	<ul style="list-style-type: none"> Corruption and Bribery Incidents (P125) (NA)
GRI 206: Anti-competitive Behavior 2016		
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	<ul style="list-style-type: none"> Anti-Competitive Behavior Incidents (P125) (NA)
GRI 207: Tax 2019		
207-1	Approach to tax	
207-2	Tax governance, control, and risk management	
207-3	Stakeholder engagement and management of concerns related to tax	
207-4	Country-by-country reporting	

300 Environmental

GRI 301: Materials 2016		
301-1	Materials used by weight or volume	<ul style="list-style-type: none"> Environmental Performance (P29) INPUT (P30)
301-2	Recycled input materials used	<ul style="list-style-type: none"> Environmental Performance (P29) INPUT (P30)
301-3	Reclaimed products and their packaging materials	<ul style="list-style-type: none"> Results of the Fourth Five-Year Environmental Action Plan>Recycling rate (P25)

GRI 302: Energy 2016		
302-1	Energy consumption within the organization	<ul style="list-style-type: none"> • Environmental Performance (P29) • INPUT (P30)
302-2	Energy consumption outside of the organization	<ul style="list-style-type: none"> • Environmental Performance (P29) • INPUT (P30)
302-3	Energy intensity	<ul style="list-style-type: none"> • Results of the Fourth Five-Year Environmental Action Plan (P25)
302-4	Reduction of energy consumption	<ul style="list-style-type: none"> • Results of the Fourth Five-Year Environmental Action Plan (P25) • Environmental Performance (P29) • INPUT (P30)
302-5	Reductions in energy requirements of products and services	
GRI 303: Water and Effluents 2018		
303-1	Interactions with water as a shared resource	<ul style="list-style-type: none"> • Risk Management of Water Resources and Response (P38)
303-2	Management of water discharge-related impacts	<ul style="list-style-type: none"> • Regulatory Compliance (P26)
303-3	Water withdrawal	<ul style="list-style-type: none"> • Environmental Performance>Water Consumption and Recycling Rate>Water Withdrawal by Source, Water Discharge by Destination, Recycled Amount, Recycling Rate (P29) • INPUT (P30)
303-4	Water discharge	<ul style="list-style-type: none"> • Environmental Performance>Water Consumption and Recycling Rate>Water Withdrawal by Source, Water Discharge by Destination, Recycled Amount, Recycling Rate (P29) • OUTPUT (P30)
303-5	Water consumption	<ul style="list-style-type: none"> • Environmental Performance (P29) • INPUT (P30) • Risk Management of Water Resources and Response (P38)
GRI 304: Biodiversity 2016		
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	<ul style="list-style-type: none"> • Biodiversity Survey of Company-Owned Site (P40)
304-2	Significant impacts of activities, products, and services on biodiversity	
304-3	Habitats protected or restored	<ul style="list-style-type: none"> • Employee Volunteering (P40)
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	
GRI 305: Emissions 2016		
305-1	Direct (Scope1) GHG emissions	<ul style="list-style-type: none"> • Environmental Performance (P29) • OUTPUT (P30)
305-2	Energy indirect (Scope 2) GHG emissions	<ul style="list-style-type: none"> • Environmental Performance (P29) • OUTPUT (P30) • Introduction of Green Power (P35)
305-3	Other indirect (Scope 3) GHG emissions	<ul style="list-style-type: none"> • Scope 3 GHG Emissions (P36)
305-4	GHG emissions intensity	<ul style="list-style-type: none"> • Reducing CO₂ Emissions Associated with Manufacturing Activities (P32)
305-5	Reduction of GHG emissions	<ul style="list-style-type: none"> • Results of the Fourth Five-Year Environmental Action Plan (P25) • Environmental Efficiency (P28) • Measures to Reduce CO₂ Emissions and Effects (P33) • Energy-Saving Activities for General-Purpose Equipment and Buildings (P33-34) • Global Warming Countermeasures Taken by Group Companies (P35) • Reduction of CO₂ in Logistics Processes (P35)
305-6	Emissions of ozone-depleting substances (ODS)	

305-7	Nitrogen oxides (NO _x), sulfur oxides (SO _x), and other significant air emissions	
GRI 306: Waste 2020		
306-1	Waste generation and significant waste-related impacts	<ul style="list-style-type: none"> • Environmental Performance (P29) • OUTPUT (P30) • Promoting Effective Use of Resources (P37)
306-2	Management of significant waste-related impacts	<ul style="list-style-type: none"> • Promoting Effective Use of Resources (P37)
306-3	Waste generated	<ul style="list-style-type: none"> • Environmental Performance (P29) • OUTPUT (P30) • Promoting Effective Use of Resources>Amount of Discarded Materials Generated / Basic Unit per Net Sales (P37)
306-4	Waste diverted from disposal	<ul style="list-style-type: none"> • Environmental Performance (P29) • OUTPUT (P30) • Promoting Effective Use of Resources (P37)
306-5	Waste directed to disposal	<ul style="list-style-type: none"> • Environmental Performance (P29) • OUTPUT (P30)
GRI 307: Environmental Compliance 2016		
307-1	Non-compliance with environmental laws and regulations	NA
GRI 308: Supplier Environmental Assessment 2016		
308-1	New suppliers that were screened using environmental criteria	<ul style="list-style-type: none"> • Promotion of CSR Procurement (P131-132)
308-2	Negative environmental impacts in the supply chain and actions taken	

400 Social

GRI 401: Employment 2016		
401-1	New employee hires and employee turnover	<ul style="list-style-type: none"> • Diversity>New Graduate Hires (P64) • Employee Turnover Ratio (P75)
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	<ul style="list-style-type: none"> • Enhancement of Work-Life Balance Systems (P84) • Systems Operated Independently by NGK (P85)
401-3	Parental leave	<ul style="list-style-type: none"> • Overview of Childrearing Support Measures and Users (P85)
GRI 402: Labor/Management Relations 2016		
402-1	Minimum notice periods regarding operational changes	
GRI 403: Occupational Health and Safety 2018		
403-1	Occupational health and safety management system	<ul style="list-style-type: none"> • Occupational Safety and Health (P76-79)
403-2	Hazard identification, risk assessment, and incident investigation	<ul style="list-style-type: none"> • Occupational Safety and Health (P76-79)
403-3	Occupational health services	<ul style="list-style-type: none"> • Occupational Safety and Health (P76-79) • Health Management (P80-82)
403-4	Worker participation, consultation, and communication on occupational health and safety	<ul style="list-style-type: none"> • Occupational Safety and Health (P76-79) • Health Management (P80-82)
403-5	Worker training on occupational health and safety	<ul style="list-style-type: none"> • Occupational Safety and Health (P76-79) • Health Management (P80-82)
403-6	Promotion of worker health	<ul style="list-style-type: none"> • Occupational Safety and Health (P76-79) • Health Management (P80-82)
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	<ul style="list-style-type: none"> • Lost-Worktime Injury Incidence (Contractors) (P78) • Supplier Training-driven Support Efforts (P133)

403-8	Workers covered by an occupational health and safety management system	<ul style="list-style-type: none"> Occupational Safety and Health (P76-79) Health Management (P80-82)
403-9	Work-related injuries	<ul style="list-style-type: none"> Occupational Safety and Health>Number of Deaths, Work-Related Accidents, Lost Worktime Accidents and Non-Lost Worktime Accidents by Type, Severity Rate (number of lost workdays per 1,000 hours worked), Lost-Worktime Injury Incidence (Employees) (P76-79)
403-10	Work-related ill health	<ul style="list-style-type: none"> Occupational Safety and Health>Frequency Employee Occupational Illness (P76-79)
GRI 404: Training and Education 2016		
404-1	Average hours of training per year per employee	<ul style="list-style-type: none"> Average Time Spent in Training Annually per Employee (P71)
404-2	Programs for upgrading employee skills and transition assistance programs	<ul style="list-style-type: none"> Skills Development for Employees (P71-74)
404-3	Percentage of employees receiving regular performance and career development reviews	<ul style="list-style-type: none"> Work Performance Evaluation (P75)
GRI 405: Diversity and Equal Opportunity 2016		
405-1	Diversity of governance bodies and employees	<ul style="list-style-type: none"> Diversity (P64-69) Board of Directors, Audit & Supervisory Board, Executive Officers (P100-103) Board of Directors Diversity Policy (P106) Corporate Governance Report, Views on the Balance Between Knowledge, Experience, and Skills of the Board of Directors as a Whole, and Diversity and Size of the Board (P5)
405-2	Ratio of basic salary and remuneration of women to men	<ul style="list-style-type: none"> Equal Compensation (P69)
GRI 406: Non-discrimination 2016		
406-1	Incidents of discrimination and corrective actions taken	
GRI 407: Freedom of Association and Collective Bargaining 2016		
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	<ul style="list-style-type: none"> Human Rights (P51-55)
GRI 408: Child Labor 2016		
408-1	Operations and suppliers at significant risk for incidents of child labor	<ul style="list-style-type: none"> Human Rights (P51-55) Supply Chain Management (P130-133)
GRI 409: Forced or Compulsory Labor 2016		
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	<ul style="list-style-type: none"> Human Rights (P51-55) Supply Chain Management (P130-133)
GRI 410: Security Practices 2016		
410-1	Security personnel trained in human rights policies or procedures	
GRI 411: Rights of Indigenous Peoples 2016		
411-1	Incidents of violations involving rights of indigenous peoples	NA
GRI 412: Human Rights Assessment 2016		
412-1	Operations that have been subject to human rights reviews or impact assessments	<ul style="list-style-type: none"> Human Rights (P51-55) Supply Chain Management (P130-133)
412-2	Employee training on human rights policies or procedures	<ul style="list-style-type: none"> Human Rights (P51-55) Supply Chain Management (P130-133)
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	
GRI 413: Local Communities 2016		
413-1	Operations with local community engagement, impact assessments, and development programs	<ul style="list-style-type: none"> Social Contribution Activity (P87-92)
413-2	Operations with significant actual and potential negative impacts on local communities	

GRI 414: Supplier Social Assessment 2016		
414-1	New suppliers that were screened using social criteria	<ul style="list-style-type: none"> • Due Diligence Processes and Assessment (P54) • Supply Chain Management (P130-133)
414-2	Negative social impacts in the supply chain and actions taken	
GRI 415: Public Policy 2016		
415-1	Political contributions	<ul style="list-style-type: none"> • Donations and Other Spending (P129)
GRI 416: Customer Health and Safety 2016		
416-1	Assessment of the health and safety impacts of product and service categories	<ul style="list-style-type: none"> • Quality Activity System (P57)
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	NA
GRI 417: Marketing and Labeling 2016		
417-1	Requirements for product and service information and labeling	
417-2	Incidents of non-compliance concerning product and service information and labeling	NA
417-3	Incidents of non-compliance concerning marketing communications	NA
GRI 418: Customer Privacy 2016		
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	NA
GRI 419: Socioeconomic Compliance 2016		
419-1	Non-compliance with laws and regulations in the social and economic area	NA

ISO 26000 Index

This table shows a comparison of seven core subjects of ISO 26000 and sustainability activities of NGK.

ISO26000 Core Subjects	Issues	NGK Report 2021		NGK Sustainability Data Book 2021	
		Page	Corresponding items	Page	Corresponding items
Organizational Governance	Organizational Governance	05	NGK Group Philosophy	01	NGK Group Philosophy
		09	Message from the President	04	Message from the President
		21	Towards Realization of the NGK Group Vision	14	ESG Management
		29	Overview of Business Results and Management Policies	16	Values Provided by the NGK Group
		37	ESG Management	93	Governance (General)
		39	Corporate Governance		
		55	Risk Management		
Human Rights	1. Due diligence 2. Human rights risk situations 3. Avoidance of complicity 4. Resolving grievances 5. Discrimination and vulnerable groups 6. Civil and political rights 7. Economic, social and cultural rights 8. Fundamental principles and rights at work	09	Message from the President	04	Message from the President
		37	ESG Management	14	ESG Management
		39	Corporate Governance	16	Values Provided by the NGK Group
		61	Human Rights	51	Human Rights: Basic Approach
		62	Supply Chain	54	Due Diligence Processes and Assessment
		63	Safe and Comfortable Workplaces	76	Occupational Safety and Health
		64	Human Resource Development	80	Health Management
				119	NGK Group Code of Conduct
				121	Compliance Promotion Structure
				122	Whistleblowing System
				126	Compliance Education for Employees
				131	Promotion of CSR Procurement
Labour Practices	1. Employment and employment relationships 2. Conditions of work and social protection 3. Social dialogue 4. Health and safety at work 5. Human development and training in the workplace	61	Human Rights	04	Message from the President
		63	Safe and Comfortable Workplaces	51	Human Rights: Basic Approach
		64	Human Resource Development	64	Diversity
				71	Human Resource Development
				76	Occupational Safety and Health
				80	Health Management
				83	Work-Life Balance
				119	NGK Group Code of Conduct
				126	Compliance Education for Employees
				128	Customer Relationship Management
Environment	1. Prevention of pollution 2. Sustainable resource use 3. Climate change mitigation and adaptation 4. Protection of the environment, biodiversity and restoration of natural habitats	09	Message from the President	04	Message from the President
		19	NGK Group Environmental Vision	17	Environmental (General)
		57	Environmental	119	NGK Group Code of Conduct
Fair Operating Practices	1. Anti-corruption 2. Responsible political involvement 3. Fair competition 4. Promoting social responsibility in the value chain 5. Respect for property rights	39	Corporate Governance	04	Message from the President
		62	Supply Chain	117	Intellectual Property Management
				119	NGK Group Code of Conduct
				121	Compliance Promotion Structure
				122	Corruption Prevention Structure
				122	Whistleblowing System
				123	Observing Competition Laws and Other Laws and Regulations Pertaining to Business Transactions
				125	Strict Adherence to Laws and Regulations Relating to Export Management
				126	Compliance Education for Employees
				129	Impact on policy
				130	Supply Chain Management
				131	Promotion of CSR Procurement
				134	Information Security

ISO26000 Core Subjects	Issues	NGK Report 2021		NGK Sustainability Data Book 2021	
		Page	Corresponding items	Page	Corresponding items
Consumer Issues	1. Fair marketing, factual and unbiased information and fair contractual practices	39	Corporate Governance	17	Environmental (General)
		57	Environmental	56	Quality Activity: Basic Approach
	2. Protecting consumers' health and safety			57	Quality Activity System
	3. Sustainable consumption			58	Quality Risk Management
	4. Consumer service, support, and complaint and dispute resolution			59	Quality Activities at Production Bases outside Japan
	5. Consumer data protection and privacy			60	QuiC Activities to Improve Quality with Full Employee Participation
	6. Access to essential services			61	Strengthening Quality-Related Education
Community Involvement and Development	7. Training and awareness-raising			119	NGK Group Code of Conduct
				121	Compliance Promotion Structure
				126	Compliance Education for Employees
	1. Community involvement	37	ESG Management	14	ESG Management
	2. Training and culture	63	Safe and Comfortable Workplaces	51	Human Rights: Basic Approach
	3. Employment creation and skills development	64	Human Resource Development	64	Diversity
	4. Technology development and access			71	Human Resource Development
	5. Wealth and income creation			76	Occupational Safety and Health
	6. Health			80	Health Management
	7. Social investment			83	Work-Life Balance
				87	Social Contribution Activity: Basic Approach
				88	Social Contribution Activities by NGK
				89	Support for Volunteer Activities by Employees
				90	Employee Volunteering
				119	NGK Group Code of Conduct

Corporate Outline (As of March 31, 2021)

Corporate Outline

Company name	NGK Insulators, Ltd.	Consolidated subsidiaries	45
Address	2-56 Suda-cho, Mizuho, Nagoya 467-8530, Japan Telephone + (81) 52-872-7181	Equity-method affiliates	2
Established	May 5, 1919	Employees	NGK 4,316 Consolidated 19,695
Paid-in capital	69.8 billion yen	Stock exchange code	5333
Net sales	452.0 billion yen (consolidated, for FY2020)		

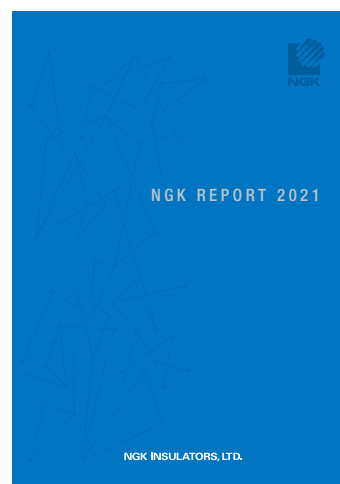
NGK Group Website

This is the Sustainability Data Book 2020, a report on NGK's sustainability-related efforts. Our website also has sustainability information, in addition to detailed corporate information and investor relations.



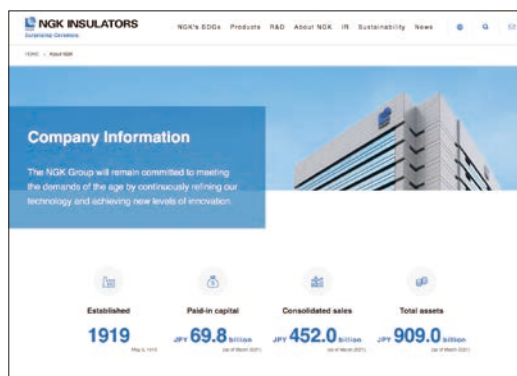
Sustainability

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



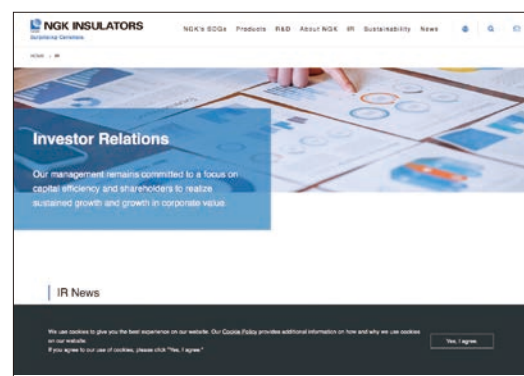
NGK REPORT 2021

<https://www.ngk-insulators.com/en/sustainability/pdf/2021/ngk2021.pdf>



Company Information

<https://www.ngk-insulators.com/en/info/>



Investor Relations

<https://www.ngk-insulators.com/en/ir/>

NGK Group

NGK Insulators

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

Group Companies

Japan

ENERGY SUPPORT CORPORATION
KANSAI ENERGYS CORPORATION
KYUSHU ENERGYS CO., LTD.
HOKURIKU ENERGYS CORPORATION
ENERGYS SANGYO CORPORATION
AKECHI INSULATORS, LTD.
NGK OKHOTSK, LTD.
NGK METEX CORPORATION
NGK FINE MOLDS, LTD.
NGK CERAMIC DEVICE CO., LTD.
NGK ELECTRONICS DEVICES, INC.
NGK CHEMITECH, LTD.
NGK FILTECH, LTD.
NGK ADREC CO., LTD.
NGK KILNTECH CORPORATION
NGK LIFE CO., LTD.
NGK YU-SERVICE CO., LTD.
NGK LOGISTICS, LTD.

America

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

Europe, Africa

NGK ITALY S.R.L.
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.
NGK CERAMICS SOUTH AFRICA (PTY) LTD.

Asia, Oceania

NGK INSULATORS (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.
ENERGYS ELECTRIC SHANGHAI CORPORATION
NGK ENERGYS MYANMAR CO., LTD.
NGK ELECTRONICS DEVICES (M) SDN. BHD.
NGK GLOBETRONICS TECHNOLOGY SDN. BHD.

Independent Practitioner's Assurance

Deloitte.

デロイト トーマツ

(TRANSLATION)

Independent Practitioner's Assurance Report

September 3, 2021

Mr. Shigeru Kobayashi,
President,
NGK Insulators, Ltd.

Masahiko Sugiyama
Representative Director
Deloitte Tohmatsu Sustainability Co., Ltd.
3-2-3, Marunouchi, Chiyoda-ku, Tokyo

We have undertaken a limited assurance engagement of the energy-origin CO₂ emissions on a non-consolidated basis on page 29 (the "CO₂ Information") for the year ended March 31, 2021 included in the "NGK Sustainability Data Book 2021 (PDF)" (the "Report") of NGK Insulators, Ltd. (the "Company").

The Company's Responsibility

The Company is responsible for the preparation of the CO₂ Information in accordance with the calculation and reporting standard adopted by the Company (the Report page 30). CO₂ quantification is subject to inherent uncertainty for reasons such as incomplete scientific knowledge used to determine emissions factors and numerical data.

Our Independence and Quality Control

We have complied with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. We apply International Standard on Quality Control 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements*, and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Our Responsibility

Our responsibility is to express a limited assurance conclusion on the CO₂ Information based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with the International Standard on Assurance Engagements ("ISAE") 3000, *Assurance Engagements Other than Audits or Reviews of Historical Financial Information*, issued by the International Auditing and Assurance Standards Board ("IAASB"), ISAE 3410, *Assurance Engagements on Greenhouse Gas Statements*, issued by the IAASB and the *Practical Guideline for the Assurance of Sustainability Information*, issued by the Japanese Association of Assurance Organizations for Sustainability Information.

The procedures we performed were based on our professional judgment and included inquiries, observation of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records. These procedures also included the following:

- Evaluating whether the Company's methods for estimates are appropriate and had been consistently applied. However, our procedures did not include testing the data on which the estimates are based or reperforming the estimates.
- Performing interviews of responsible persons and inspecting documentary evidence to assess the completeness of the data, data collection methods, source data and relevant assumptions applicable to the sites.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement.

Limited Assurance Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the CO₂ Information is not prepared, in all material respects, in accordance with the calculation and reporting standard adopted by the Company.

The above represents a translation, for convenience only, of the original Independent Practitioner's Assurance report issued in the Japanese language.

Member of
Deloitte Touche Tohmatsu Limited

External Evaluation / Editorial Policy

External Evaluation

In November 2020, NGK was selected for the 5th consecutive year for the Dow Jones Sustainability Asia Pacific Index in the Dow Jones Sustainability Indices, a major index for socially responsible investment.

NGK has been honored with other selections. These include the MSCI Japan ESG Select Leaders Index, an operator of Japan's Government Pension Investment Fund (GPIF); the MSCI Japan Empowering Women (WIN) Index; and the 2021 Certified Health & Productivity Management Outstanding Organizations Recognition Program (White 500), managed by Japan's Ministry of Economy, Trade and Industry (METI) and the Nippon Kenko Kaigi.

Member of
**Dow Jones
Sustainability Indices**
Powered by the S&P Global CSA

**2021 CONSTITUENT MSCI JAPAN
ESG SELECT LEADERS INDEX**

THE INCLUSION OF [ISSUER ENTITY NAME] 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 [ISSUER ENTITY NAME] 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.

**2021 CONSTITUENT MSCI JAPAN
EMPOWERING WOMEN INDEX (WIN)**



Ministry of Health, Labor and Welfare "L-boshi" certification of corporate excellence in the promotion of women's active participation Certification level 3



Ministry of Health, Labor and Welfare Next-generation support certification logo "Kurumin"

Editorial Policy

The NGK Sustainability Data Book 2021 reports details of the NGK Group's ESG information. Stakeholders can find separate information on what strengths the NGK Group has to offer, how we are creating value, how we plan to grow further, and how we are contributing to sustainable development of society and the entire world in the NGK Report 2021. This data book has been prepared and edited in line with the Global Reporting Initiative (GRI) Sustainability Reporting Standards.

■ Target Organization

Indicated along with each article and data report included in this data book.

■ Target Period

April 1, 2020 to March 31, 2021

■ Forward-looking Statements

This report contains forward-looking statements such as performance forecasts. These forward-looking statements are based on things such as information currently available to NGK and on certain assumptions judged to be rational. Please note that actual performance may differ from forecasts due to various unforeseen reasons.



NGK INSULATORS, LTD.

2-56, Suda-cho, Mizuho, Nagoya 467-8530, Japan

For inquiries about this report, please contact

ESG Management Department

Tel: +(81) 52-872-7597 E-mail: pr-office@ngk.co.jp

<https://www.ngk-insulators.com/en/>

NAS, HONEYCERAM, HICERAM, and EnerCera are trademarks of NGK INSULATORS, LTD., registered in the U.S.

Plate making: This report has been published using computer-to-plate (CTP) technology to eliminate the need for the film and other materials required in the conventional platemaking process.
Printing: A waterless printing method has been adopted to significantly reduce the usage of developer chemicals and processing water, thereby decreasing the amount of hazardous effluent, compared with conventional methods.

Ink: To replace petroleum-based inks, vegetable-based inks with the volatile organic compounds (VOCs) content reduced to below 1% have been employed.

Design: This report has been designed, with a focus on typeface, color scheme and diagram style, to improve legibility and readability.

Published in October 2021
Revised in November 2021