

 **Beyond ceramics,
eXceeding imagination**

Nitterra

Corporate Brochure

Becoming a shining power for the earth.

Effective April 1, 2023,
our English company name has changed to "Niterrra Co., Ltd."
As a result, NGK SPARK PLUG Group has become the "Niterrra Group".



Brilliant ideas for a brighter future.

NGK SPARK PLUG group is now Niterra group.

Niterrra



Concept behind Niterra

Niterrra is a word that we have coined that combines "niteo", which means "shine" in Latin, and "terra", which means "earth".

It expresses the Group's thoughts and stance of becoming a company that not only contributes to a sustainable society, but also brightens the entire global environment.

Top Message



Since its foundation in 1936, the Niterra Group has been exploring the potential of ceramics and contributing to social development while building trust with our customers, driven by the mindset of "Participation of all employees" and "Producing quality products," which are the starting points for all our manufacturing. By doing so, we have worked to earn the trust of customers in Japan and overseas under the "NGK SPARK PLUG" company name.

However, in an era when the automotive industry is undergoing a once-in-a-century transformation, we believe that in order to achieve solutions to social issues faster than ever before, in our various initiatives we need to bring about change that is not simply an extension of the past.

As part of this effort, we have decided to change our English company name from its existing name, NGK SPARK PLUG. Our new English company name is Niterra. This is a coined word that combines the Latin words "niteo," (meaning "shine") and "terra" (meaning "earth"). It expresses the Group's desire and commitment to become a company that brightens the global environment—that truly makes the earth shine.

With technologies that transcend the realm of ceramics, our Group helps realize a better society by addressing diverse global issues. While maintaining the shared values of the "Niterra Way" that we have cultivated over the years, each and every Niterra employee will stay mindful of our call to action—"Change with Will !!"—and will continue to seek solutions to social issues with the highest aspirations.

We sincerely appreciate your continued, generous support of the Niterra Group.

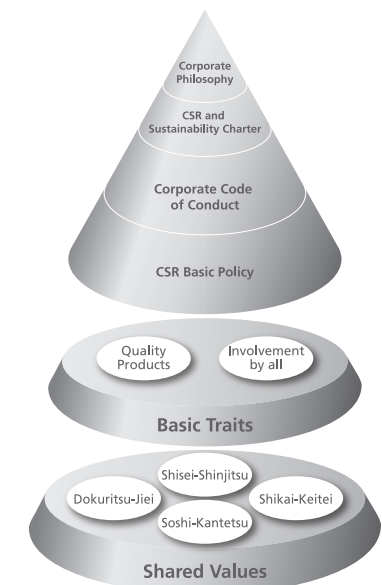
Shinichi Odo
Representative Director Chairman of the Board

Takeshi Kawai
Representative Director President & Chief Operating Officer

The Niterra Way

We aim to provide real value as a company that is indispensable to the world.

The Niterra Way refers to a set of philosophies that includes values that are shared by the entire Niterra Group, and the actions based on those philosophies, as well as the manner in which those actions are carried out.



Corporate Philosophy

Realize our imagination.
We continue to offer new ideas and new values.

At Niterra, we aim to contribute to people all over the world by linking people to technologies and delivering new values. As a truly global corporation, we want to build stronger ties not only with customers and the residents of local communities, but also with local and global environments. We are always working to make our corporate philosophy and our commitments a reality.

Three elements constitute our corporate philosophy.

1. Commitment

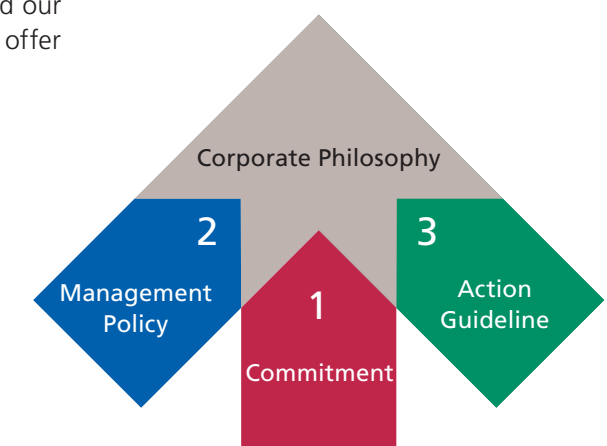
With full use of the most suitable technology and our accumulated experience, we continue striving to offer new values to the peoples of the world.

2. Management Policy

We offer a working environment in which each one of us is encouraged to make full use of his or her personality and capabilities. With all our power we are dedicated to pursuing management based on trust and confidence.

3. Action Guideline

Ever onward! Always mindful of what is the best course, we swiftly put it into action.



**Beyond ceramics,
eXceeding imagination**

2040 Vision
—Change drastically beyond
the current way—

By 2040 we aim to create a new Niterra group with the vision of "Beyond ceramics, eXceeding imagination".

The Niterra Group is active around the world

Number of overseas bases

61

Ratio of overseas employees

About 47 %

Number of countries in which Niterra Group products are sold

About 145

Sales of the entire Niterra Group

614.4 billion yen

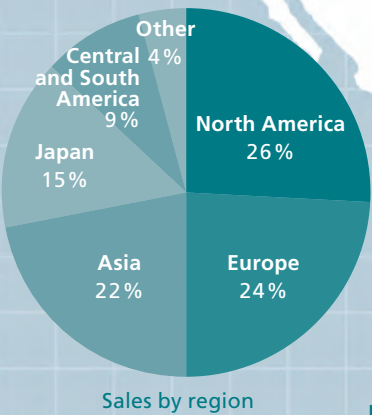
Spark plug global market share
Oxygen sensor global market share

No.1

*Niterra research as of March 2023

Overseas sales ratio

85 %



Percentage of employees who have experience being seconded overseas

10.3 %

*Generalist (Classified, Considered) only

Overall group operating profit ratio

17.5 %

- Headquarters
- Technical center
- Manufacturing & Sales organization
- Holding company
- Sales organization
- Other organization

*Figures current as of March 31, 2024, unless otherwise noted.

Business of the Niterra Group

We contribute to the realization of a better society by providing products and services used in a wide range of fields such as automotive parts, semiconductor related parts, medical equipment, and industrial ceramic parts.

Automotive Parts

Next-generation mobility connected by ceramics

We leverage the characteristics of ceramics, with spark plugs and sensors etc., taking great pride in our top global market share, towards the creation of an environmentally friendly mobility society that enriches people's lives. See P9 for our products and services



Semiconductor Related Parts

The future IoT society created with ceramics

Realizing a future society of IoT and advanced communications by independently developing and providing parts to support semiconductor development and manufacturing. See P10 for our products and services

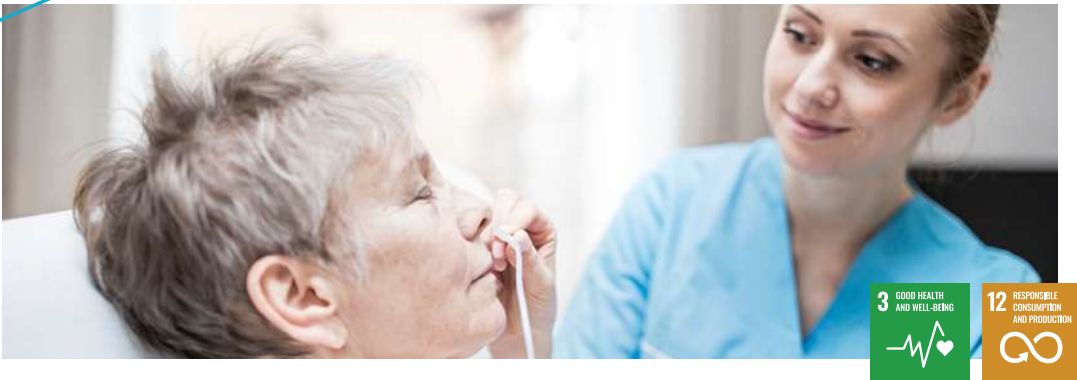


Medical Equipment

Creating a healthy and prosperous society alongside patients

We are committed to improving the quality of life of people around the world with products that meet various needs to realize a society in which people enjoy lives of good health and abundance.

See P12 for our products and services



Industrial Ceramic Parts

Supporting global industries with ceramics

We offer optimal solutions for global industries with products that bring together our core technologies, such as piezoelectric elements using ceramics.

See P11 for our products and services



New Products / Services

Creating a future beyond imagination with technologies that transcend boundaries

We are committed to confronting global challenges and creating a future beyond current human imagination with products and services in new fields that transcend ceramics technologies. See P13 for our products and services



Representative products

Products that aim to solve social issues in various business fields

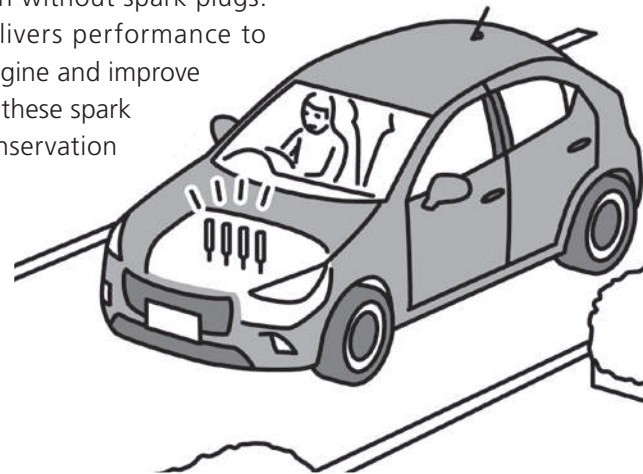
Automotive Parts

Next-Generation Mobility Connected by Ceramics

We leverage the characteristics of ceramics, such as spark plugs and sensors, taking great pride in our global top market share, to create an environmentally friendly mobility society that enriches people's lives.

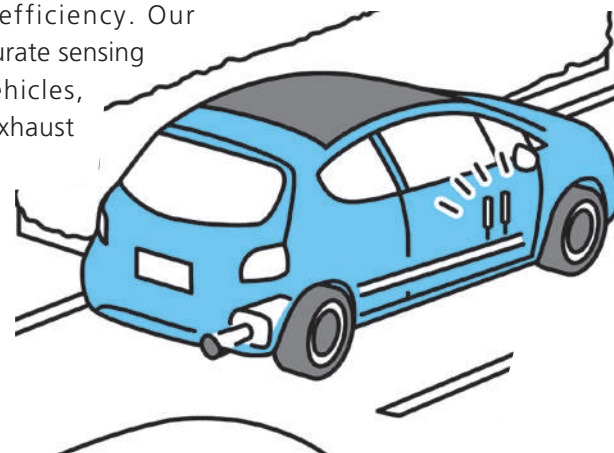
Plugs

Our spark plug was the first to be made in Japan. We now enjoy the top market share in the world. Spark plugs play a crucial role in starting the engine; cars simply cannot run without spark plugs. Our proprietary ceramics technology delivers performance to withstand harsh environments inside the engine and improve fuel efficiency. By improving fuel efficiency, these spark plugs also contribute to environmental conservation by reducing CO₂ emissions.



Sensors

Sensors are core automobile components capable of sensing vibrations and exhaust gases to ensure safe, efficient engine operation. They help to detect engine abnormalities, make exhaust gas cleaner, and improve fuel efficiency. Our proprietary technology achieves fast and accurate sensing even in the harsh environments inside vehicles, enabling us to meet increasingly stringent exhaust gas emission regulations in recent years.



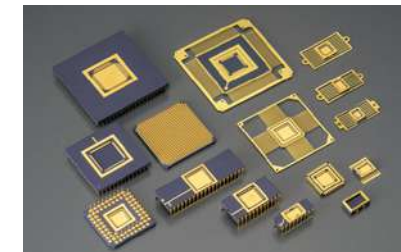
Semiconductor Related Parts

The Future IoT Society Created with Ceramics

Realizing our future IoT society and advanced communications society by independently developing and providing parts to support semiconductor development and manufacturing.

Semiconductor Packages

Semiconductor packages are essential for protecting the semiconductors used in all kinds of products, including smartphones, cameras, and cars. Our proprietary technologies protect semiconductors from heat and moisture while transmitting electrical signals to electric circuits thinner than a human hair. They are strongly expected to contribute to our ever-expanding IoT society and to play an active role in next-generation communications.

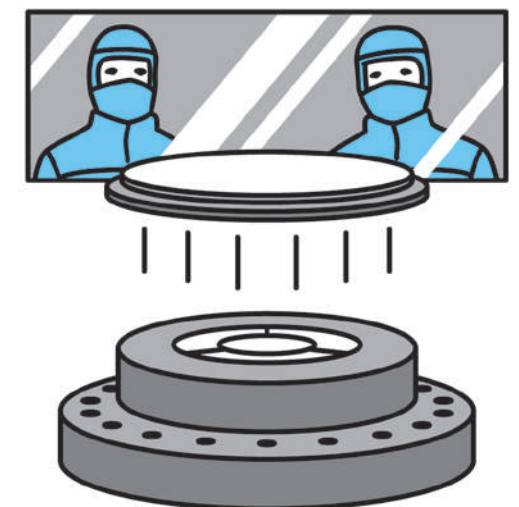


Products for Semiconductor Manufacturing Equipment

We offer a variety of components used in the semiconductor manufacturing process. Our electrostatic chucks, which make the most of the electrostatic properties of ceramics and which we produce ourselves from materials development to finishing touches, improve the quality of semiconductors with our unique technology that maintains the surface temperature of silicon wafers* at a uniform level. We will continue to contribute to improving the production efficiency of semiconductors, so essential for the IoT society of the future.



*Materials that form the substrate of semiconductors



Representative products

Products that aim to solve social issues in various business fields

Industrial ceramic Parts

Supporting the world's industries with ceramics

We offer optimum solutions for industries around the world with products that bring together our core technologies, such as piezoelectric elements that use ceramics.

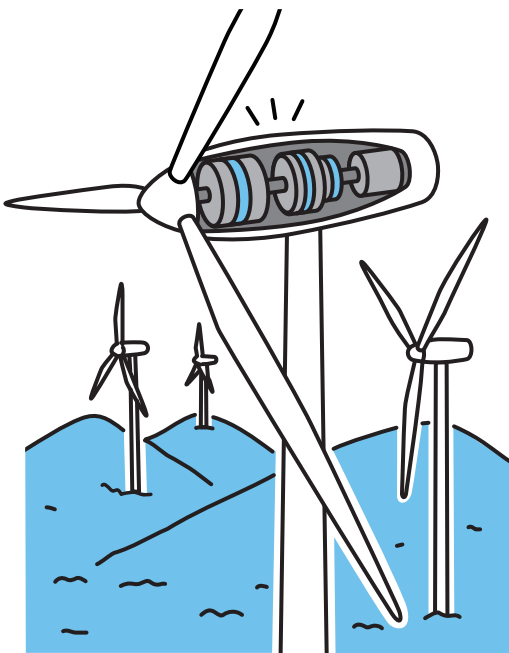
Piezoelectric ceramics

Piezoelectric ceramics are used in various products in various fields, such as medical, automobiles, and semiconductors, which are indispensable in our daily lives, taking advantage of the "voltage to vibration/pressure to voltage" characteristic of ceramics. We also sell lead-free piezoelectric ceramics, which do not contain lead aiming to realize a sustainable society.



Balls for bearings

These bearing balls are used in machine tool parts and inverter motors. They are made of lightweight, high-strength silicon nitride material and are smooth with low friction so that they can be used with a small amount of lubricant. The trend toward higher-performance inverters and motors rotating at higher speeds expands their use in EV and semiconductor manufacturing equipment applications.



Medical Equipment

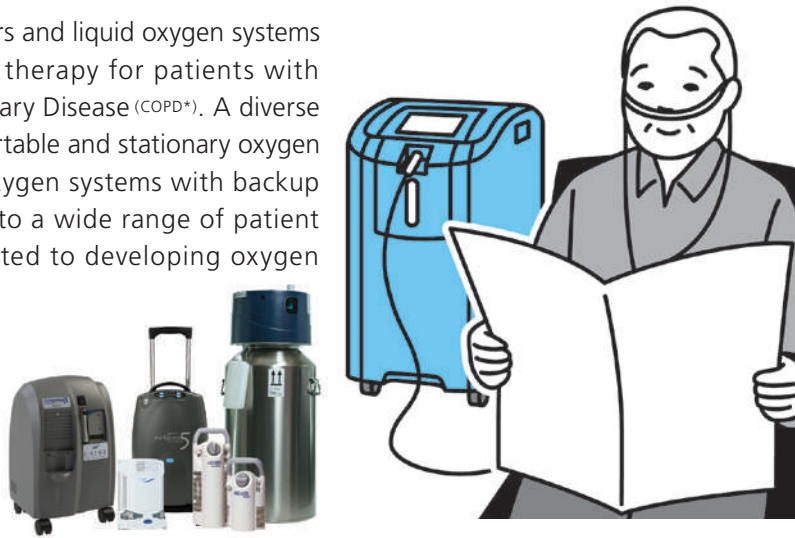
Creating a healthy and prosperous society by working closely with patients

We are committed to improving the quality of life of people around the world with products that meet various needs to realize a society in which people enjoy lives of good health and abundance.

Medical Oxygen Concentrators and Liquid Oxygen Systems

Medical oxygen concentrators and liquid oxygen systems provide high-flow oxygen therapy for patients with Chronic Obstructive Pulmonary Disease (COPD*). A diverse product lineup, including portable and stationary oxygen concentrators and liquid oxygen systems with backup power for outages, caters to a wide range of patient needs. We remain committed to developing oxygen delivery products and services that meet evolving needs and improve patient quality of life.

*A disease caused by a loss of lung function, principally due to smoking, etc. Oxygen inhalation is necessary because the blood can become oxygen-deficient.



Niterra column

Exploring needs based on experience.

Niterra Ventures Company
Medical Business Department
HH (joined in 2007)

"If things go well, we may be able to solve the problems of many women within a few years." The moment I discovered the potential for pelvic floor muscle care for postpartum women, my expectations grew. It was January 2021, 14 years after I joined the company and nine months after I transferred from the Technology Development Division to the Marketing Section. Our team was looking for new business opportunities. Based on my experience of giving birth and raising children, I came up with the idea of a

"pelvic floor muscle exercise support device". This is truly a femtech (*) device, and there is a project currently underway to put it into practical use. My own experience has also been useful in the development process. We have had postpartum women cooperate with our marketing, and without my experience, it would have been difficult for me to understand their feelings and circumstances. We also had female employees from our company act as monitors, and were able to notice many important issues from the opinions that were fed back. Once again, I realize the importance of marketing. There are still many issues to be addressed in order to make this device easy for ordinary women to use. However, if we solve these problems and give shape to this project, I think it will become a strength of the company in the future. There are unexpected hardships and problems, but every day that the project takes a step forward is fulfilling and I have felt very rewarded.

* Products and services that use technology to solve health issues for the life stages of women.



Representative products

Products that aim to solve social issues in various business fields

New Products / Services

Creating a future beyond imagination with cross-disciplinary technology

We are committed to confronting the world's challenges and creating a future beyond human imagination with products and services in new fields that transcend ceramics technology.

Doctor Link

This new cloud service uses AI and mechanics to remotely check the health of vehicles and provide vehicle owners with accurate maintenance. Diagnosis based on our big data allows us to suggest the optimal timing and content of maintenance to vehicle owners via a smartphone application, preventing car troubles before they occur. In this way, we contribute to the realization of a more convenient life of expanded mobility.



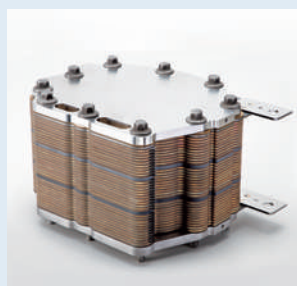
Sumikaze

This sterilization deodorizer utilizes ozone to purify the air and inhibit invisible harmful substances and viruses. It applies "plasma ceramics technology" that stably generates ozone over a long period and "sensing technology" that maintains ozone at an optimum concentration to maintain its effectiveness, keeping indoor air clean and providing a safe and secure space.



Efforts of our group

Solid oxide fuel cells (SOFC)



Solid oxide fuel cells (SOFC) are new, earth-friendly power generating devices that generate electricity through a chemical reaction between hydrogen and oxygen. Our Group is undertaking the development of cell stacks for power generation. Above all, our Group is rising to the challenge of developing compact, high-output, next-generation SOFCs. We anticipate that these will contribute to the decarbonized society of the future.

Niterra and CCU Contributing to carbon neutrality.

With the urgent need to realize a carbon-neutral society, Carbon dioxide Capture and Utilization is one technology gaining attention. This involves the recovery of CO₂ emitted from factories and reusing it as a resource. Niterra is working as a company to realize a carbon-neutral society.

Utilizing all the technological capabilities of Niterra

Various cutting-edge technologies are essential for CCU. The diversity of our technology plays an active role here. For example, for the recovery and concentration of CO₂, we use "oxygen concentrator" technology, which is actively used in the medical field. For the production of hydrogen, we use the technologies that we have cultivated through the development of solid electrolytes. The diverse expertise we have accumulated over the years is accelerating the realization of CCU.

Technologies used in CCU

Oxygen Enriched Combustion

With the technology cultivated in oxygen concentrators, it is possible to increase the oxygen concentration of combustion support gas and reduce the amount of fuel gas used and thus the CO₂ emissions. In addition, CO₂ can be easily recovered by increasing the concentration of CO₂ in exhaust gas.

Fuel/CO₂ emissions

40% reduction

*Oxygen concentration 100%

CO₂ recovery/concentration

With the technology cultivated in oxygen concentrators, it is possible to recover the CO₂ in the exhaust gas and concentrate it to a concentration that is easy to use. We are also considering the liquefaction of highly concentrated CO₂ for transportation.

CO₂ concentration in exhaust gas

96vol%

Hydrogen Production

It is possible to produce hydrogen from electricity and water in SOEC using ceramics by utilizing the technologies cultivated for solid electrolytes. Highly efficient hydrogen production is possible by combining waste heat such as from methanation.

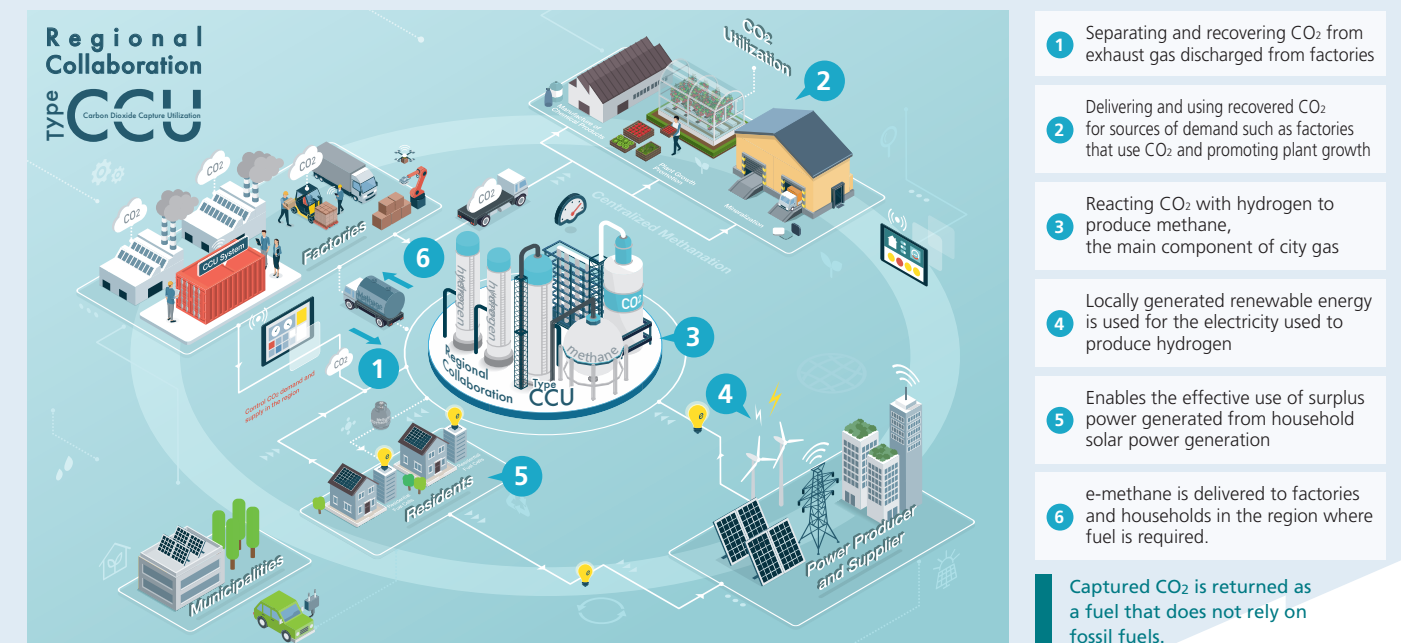
Synthetic Methane Production

Methane, the main component of city gas, can be produced through methanation from recovered CO₂ and hydrogen. We can convert energy inputs into renewable energy and achieve carbon neutrality.



Pursuing social value with "Regional CCU™".

"Regional CCU™" is a concept that uses CCU to aim for carbon neutrality throughout an entire community. Starting with companies that emit CO₂, we will circulate the flow of carbon recycling while making the most of local characteristics. At the same time as reducing CO₂ emissions to virtually zero, we will solve community social issues and revitalize local societies. This will in turn be connected to the concept of sustainable cities that will be part of the next generation. We hope to realize such a vision of the future through "Regional CCU™". The target is 2030. We will continue to work toward this goal in cooperation with other companies and local governments.



Proud Technologies of the Niterra Group

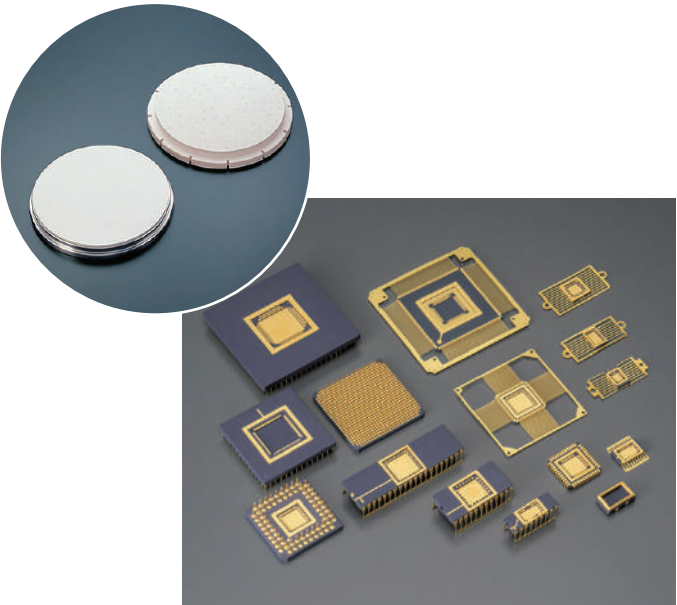
Beyond ceramics. Core technology honed through manufacturing

The Niterra Group has a wide variety of specialized technologies. Blending various materials such as ceramics with nano-level particle sizes, creating shapes freely, baking at high temperature, detecting invisible matter... for environment and energy, mobility, medical care, and communications, many different technologies have been refined in a wide range of manufacturing, including ceramics, with the potential to be used globally in areas beyond ceramics. These technologies are expected to contribute to solving the problems facing the world.

Representative core technologies of the Niterra Group

Ceramic Material Technology

We develop the materials used in manufacturing in-house. In addition to maximizing the strengths of ceramics, combining them with resins and metals brings out new performance. We also mix different types of ceramics to create ceramics with unprecedented properties.



Ceramic Molding Technology

We have the know-how to freely process ceramic materials. One of these areas is molding technology. Of the many different molding technologies such as extrusion molding and press molding, sheet lamination is one of our core technologies. It has contributed greatly to the evolution of electronic equipment and smart devices.

Functions

Our oxygen sensing technology is useful in the regulation of automobile exhaust gas. A ceramic sensor must withstand high temperature exhaust from the engine and water splashing inside the exhaust pipe. We have achieved performance that can stably and accurately sense oxygen concentrations in such harsh environments.



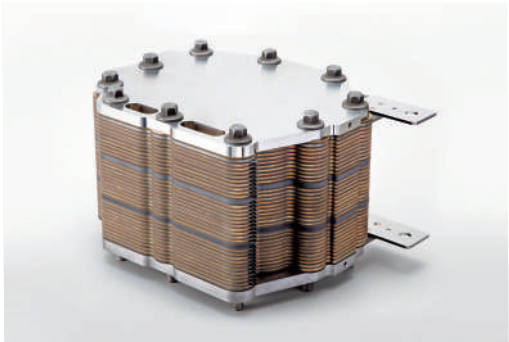
Harsh Environment Resistance

Ceramic heaters that can heat up rapidly, rising up to about 1,000°C in 1 second. We have established technology that can stably control the electrical resistance required for heaters, and provide high-quality, highly efficient heaters. These are also installed in "Electro-static chucks" used as semiconductor manufacturing equipment.



Heater Control

Power Generation Technology



Fuel cell SOFC contributing to carbon neutrality. Electricity is generated using zirconia, a material through which oxygen ions move through ceramics. To put this into practical use, Morimura SOFC, a group company, has developed a "stack" that consists of multiple layers of cells composed of sheets of zirconia. It is our aim to achieve global top-level power generation efficiency.

Plasma/ozone Control



Plasma/ozone technology leading to the purification of air and the suppression of bacteria and viruses. Using ceramics for electrodes provides excellent wear resistance and corrosion resistance, and enables stable plasma generation. Ozone is also generated from plasma energy. We have developed and sell "Sumikaze," an ozone generator which is equipped with this technology.

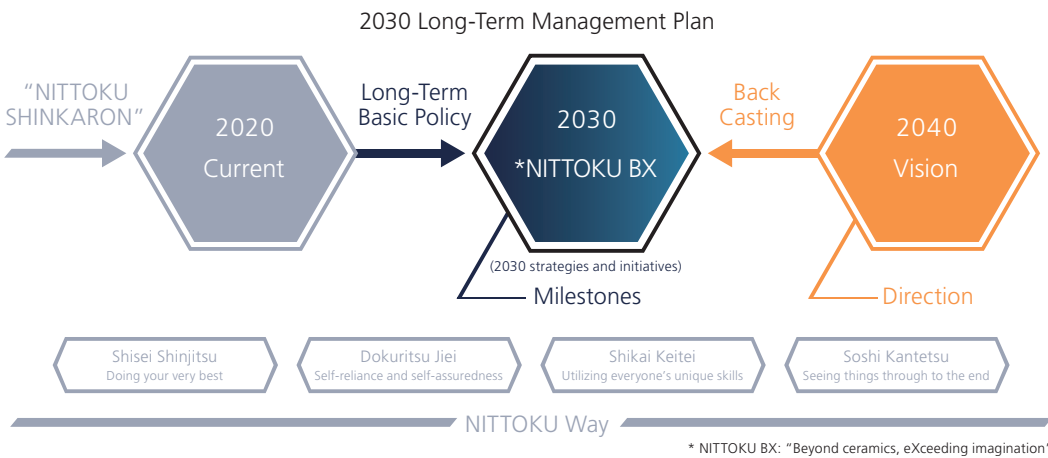
Long-Term Vision

Beyond ceramics, eXceeding imagination

- Delivering new value in the face of an ever-changing future.
- To meet large-scale global environmental changes, we too must change.
- Creating an organization comprised of passionate individuals working together to face challenges head-on in order to better society.
- We are transcending imagination with technology that transcends boundaries.
- We are more than just ceramics and we are going in new directions.

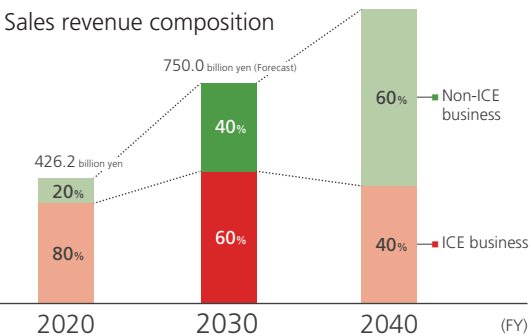
2040 Vision and the Long-Term Management Plan

We aim to meet the challenge of going “beyond ceramics” and “exceeding the imagination” of society and ourselves, thereby changing “drastically beyond the current way” in 2040. We have created the “2030 Long-term Management Plan NITTOKU BX” by backcasting from the 2040 Vision. We regard 2030 as a milestone year to ensure we are on the right path heading into 2040.



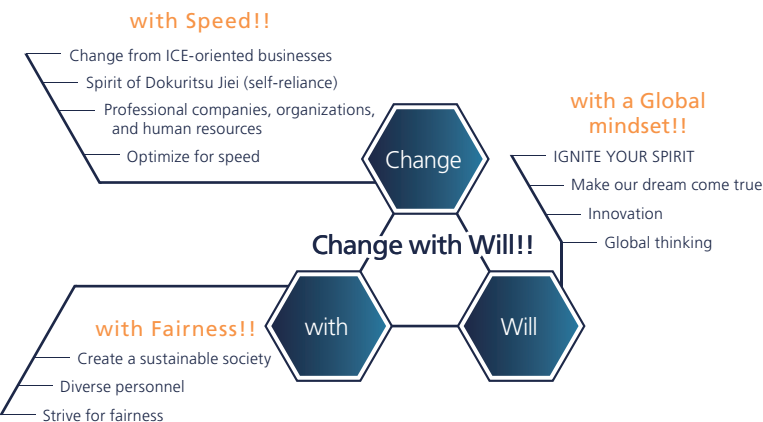
Transformation of the Business Portfolio

We aim to decrease the proportion of ICE business in our total sales revenue from the current 80% to 40% while raising that of non-ICE business from the current 20% to 60%, thereby transforming our business portfolio. As a first step, we will decrease the ratio to 60% and increase the ratio to 40% for ICE business and non-ICE business, respectively, as milestone targets for 2030.



Action Guidelines

We have upheld “Change with Will!!” as the guiding principle for the 2030 Long-term Management Plan. Specifically, with a strong commitment (“Will”), we will fast-track “Change” for coexistence with society and people.



Business Fields to Focus on

- Environment & Energy
- Mobility
- Medical
- Communication

Based on the Long-term Management Plan, we will focus on four business fields going forward: Environment & Energy, Mobility, Medical, and Communication. In this way, we have already begun to embrace challenges in order to build a sustainable society.

History and Milestones



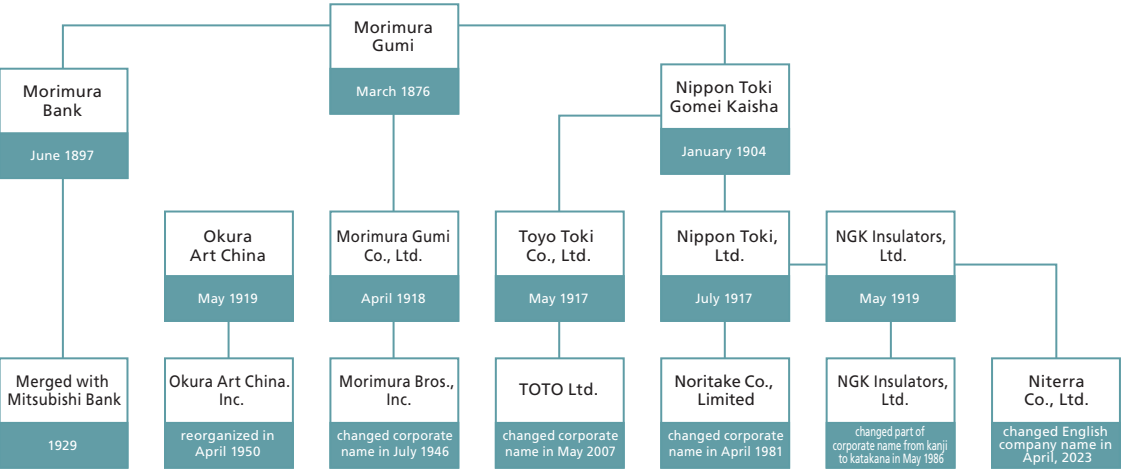
Ichizaemon Morimura

Inherited Vision

NGK SPARK PLUG (*) was founded in 1936. However, our roots can be traced back more than 140 years to the Morimura Gumi which was established in 1876 by Ichizaemon Morimura, the forefather of the Morimura Group.

Our founding father Ichizaemon Morimura was an honest and passionate merchant. Determined to reclaim wealth which had flowed overseas, Ichizaemon embraced the challenge of foreign trade for the prosperity of Japan. Eventually, the Morimura Gumi began to manufacture ceramics and the Morimura Group was born, ultimately leading to the founding of numerous prominent companies including Niterra.

Development of Morimura Group



Magoemon Ezoe
(First president of Niterra)

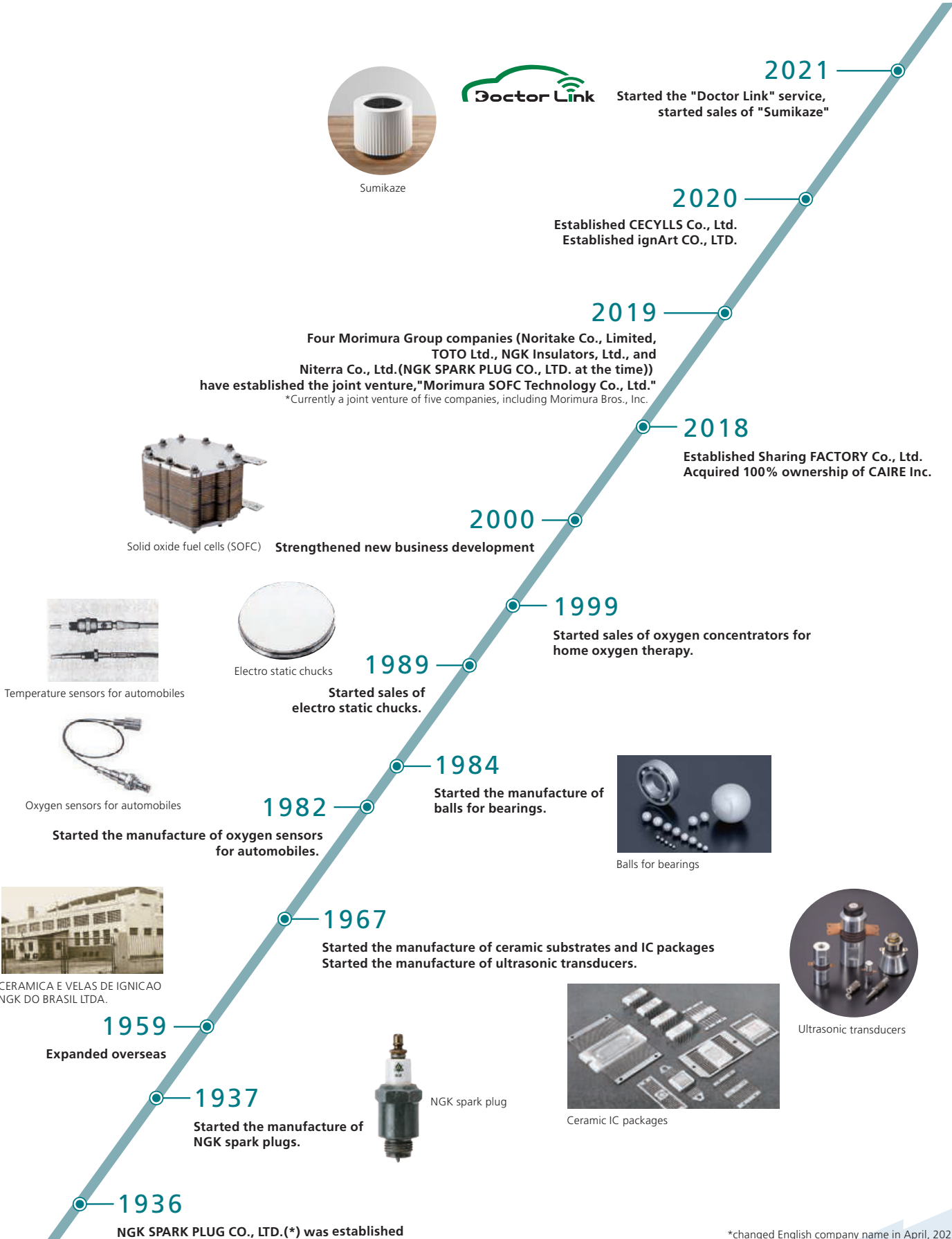
Uniform products through participation by all employees

**“Suppose that we produce only 1 defective product per 1,000 products.
To the customer who purchases that 1 product,
our defect rate is 100%.”**

As our business evolved from tableware to industrial products, we faced even stricter demands for product uniformity.

In order to constantly realize the performance needed by customers and to eliminate discrepancy among products, Magoemon Ezoe expected a high level of discipline and sense of participation to produce quality products. Employees at all workplaces devoted themselves to manufacturing which fulfilled such expectations. Even today, the philosophy of producing quality products with participation by all employees is still alive at Niterra.

History of our products and technologies



*changed English company name in April, 2023

Towards a Sustainable Society

Sustainability Action

Today, society demands business activities that will help realize a sustainable society, for example by contributing to international norms and goals such as the United Nation’s Sustainable Development Goals (SDGs). To date, we have contributed to society by pursuing businesses around our flagship internal combustion engine products. Going forward, we will work to broaden the scope within which we contribute to society by pursuing solutions to social issues through existing offerings such as oxygen concentrators and lead-free piezoelectrics as well as products and services in new areas such as fuel cells, and by communicating information about those efforts both inside and outside the company.

Social Contribution Activities



Ghibli Park Official Partner

Taking the philosophy of the Aichi Expo, of showing "love for people, living things, and the earth" under the theme of "Nature's Wisdom," we identify with the vision of Aichi Prefecture and Ghibli Park to create a park full of greenery, and will contribute to environmental conservation and regional revitalization as an official partner. We will also use this as an opportunity to raise awareness of environmental activities throughout our Group and to think about global warming and biodiversity.

スタジオジブリ | Niterra Co.,Ltd. - Ghibli Park Official Partner



Sponsorship of the Nagoya Women’s Marathon

We became a Gold Sponsor of the Marathon Festival Nagoya Aichi in 2021 out of a desire to support all people who chase their dreams and to contribute to the revitalization of local communities. Through this event, we remain committed to helping realize a better society by addressing issues faced by not only our region, but also Japan and the world.



Hosting a family musical event

To help children who will lead the next generation grow culturally and artistically, Niterra has hosted a family musical event at the NTK HALL every year since 2013. Guests include children from elementary schools and kindergartens located close to Niterra and from facilities such as residential institutions in Aichi Prefecture. Employee volunteers participate as event staff. Going forward, we will continue to undertake activities that help children to have hopes and dreams.

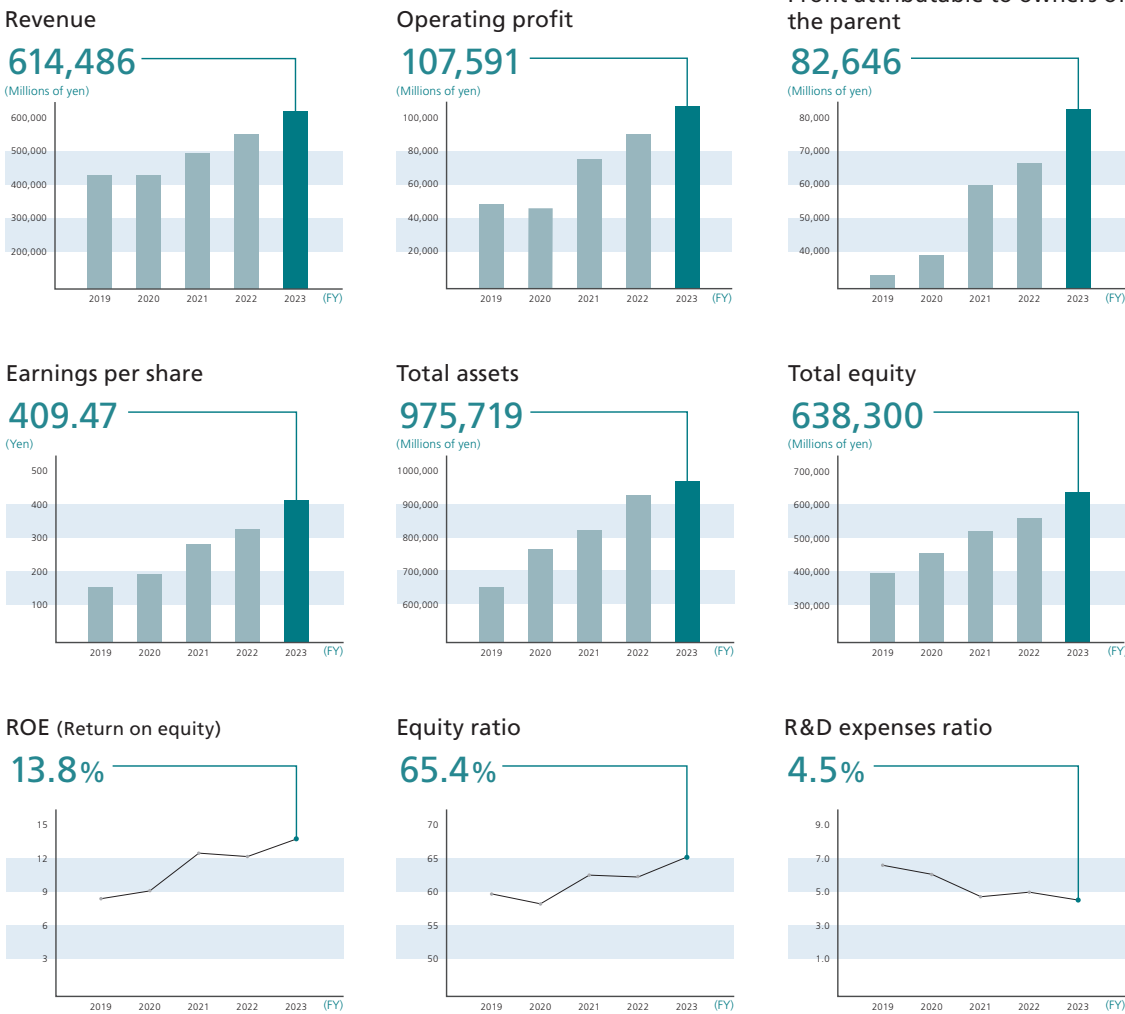
Family musical event at the Hikosen Theater Company

Overview

Company Profile

Company Name:	Niterra Co., Ltd.
Establishment:	October 26, 1936
Capital:	47,869 million yen
Headquarters:	URBANNET NAGOYA NEXTA Bldg. 1-1-1 Higashisakura, Higashi-ku, Nagoya 461-0005
Employees:	Non-Consolidated: 3,622 (as of March 2024) Consolidated: 15,980 (as of March 2024)
Business:	1. Manufacturing and selling spark plugs and related products for internal-combustion engines. 2. Manufacturing and selling technical ceramics and applicable products.
Branch Offices:	Japan:Tokyo, Osaka, Nagoya, Hiroshima, Fukuoka, Sendai, Sapporo, Atsugi, Utsunomiya Overseas: Asia/Oceania, North America, Latin America, Europe, Middle East/Africa

Financial Highlights



*In the March 2020 term, Niterra began to use IFRS-based accounting.