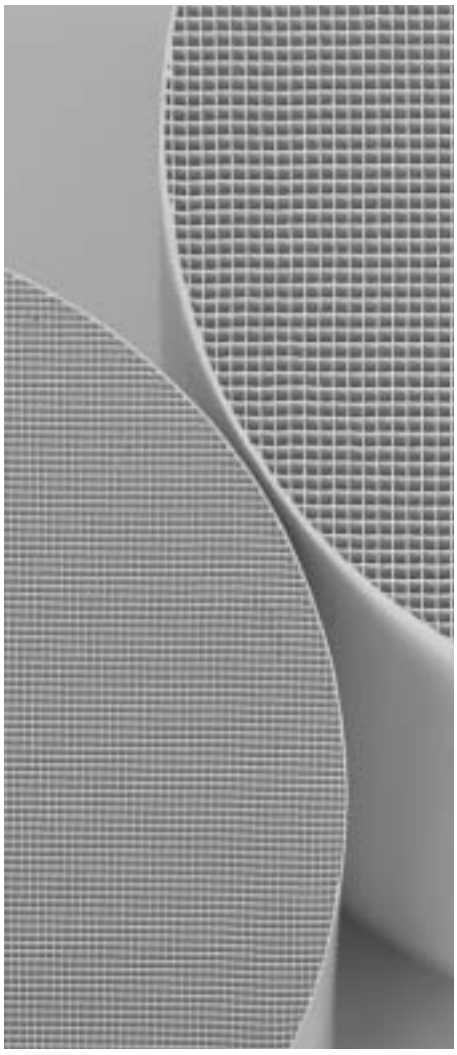


NGK Environmental and Social Responsibility Report 2004

NGK INSULATORS, LTD.

COMPANY DATA

Corporate Name	NGK Insulators, Ltd.
Location	2-56 Suda-cho, Mizuho-ku Nagoya 467-8530 Japan
	Phone +81-52-872-7171
Date of Establishment	May 5, 1919
Paid-in Capital	69.8 billion yen (as of March 31, 2004)
Number of Employees	3,556 (as of March 31, 2004)
Business	Manufacture and sale of insulators and other electrical devices, industrial ceramic products, electronic components, and specialty metals, and plant engineering

Consolidated Subsidiaries

Domestic (25 companies)

Energy Support Corporation	Tohoku Energys Corporation
Kansai Energys Corporation	Kyusyu Energys Corporation
Chubu Energys Corporation	Hokuriku Energys Corporation
Tokai Energys Corporation	Energys Sangyo Corporation
Akechi Insulators Co., Ltd.	Ikebukuro Horo Kogyo Co., Ltd.
NGK Chem-Tech, Ltd.	NGK Filtech, Ltd.
NGK Adrec Co., Ltd.	NGK Kilntech Corporation
Heisei Ceramics Co., Ltd.	NGK Enviro-Equipment Service, Ltd.*
NGK Mettex Corporation	NGK Fine Molds, Inc.
NGK Optoceramics Co., Ltd.	NGK Printer Ceramics Co., Ltd.
NGK Okhotsk, Ltd.	Soshin Electric Co., Ltd.
M. Elec Company	Koshin Electronics Co., Ltd.
Sosyo Sales Co., Ltd.	

* Changed its name to NGK-E Solution, Ltd. as of April 1, 2004

Overseas (28 companies)

NGK North America, Inc.	Locke Insulators, Inc.
NGK-Locke, Inc.	NGK-Locke Polymer Insulators, Inc.
NGK Insulators of Canada, Ltd.	NGK Europe S.A.
P.T. WIKA-NGK Insulators	NGK Insulators Tangshan Co., Ltd.
NGK Stanger Pty. Ltd.	NGK Europe GmbH
NGK Ceramics USA, Inc.	NGK Automotive Ceramics USA, Inc.
NGK Ceramics Europe S.A.	NGK Ceramics Polska Sp. z o.o.
P.T. NGK Ceramics Indonesia	NGK Ceramics Suzhou Co., Ltd.
Siam NGK Technocera Co., Ltd.	NGK Technocera Suzhou Co., Ltd.
NGK Ceramics South Africa (Pty) Ltd.	NGK Metals Corporation
FM Industries, Inc.	NGK Electronics USA, Inc.
Soshin Electronics of America Inc.	NGK Berylco France
NGK Berylco U.K. Ltd.	NGK Deutsche Berylco GmbH
Soshin Electronics (M) Sdn. Bhd.	Soshin Electronics (HK) Ltd.

Companies Accounted for by the Equity Method

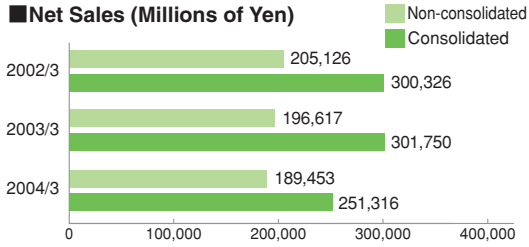
Domestic (2 companies)

Risshin Electronics Co., Ltd.	Soritsu Electronics Co., Ltd.

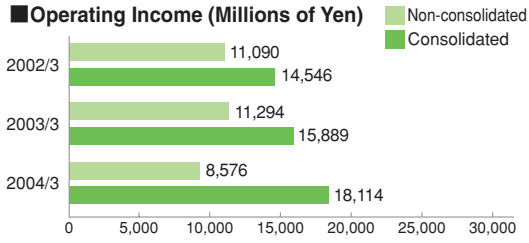
Overseas (1 company)

Birla NGK Insulators Pvt. Ltd.

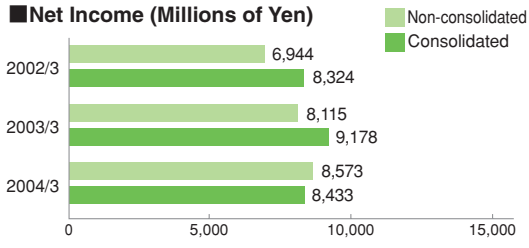
■Net Sales (Millions of Yen)



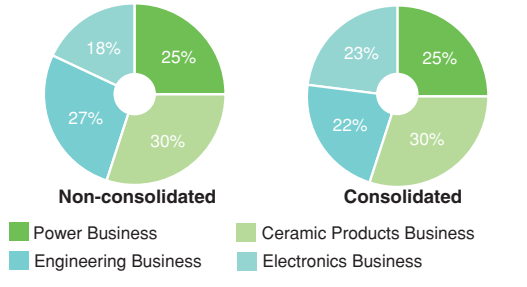
■Operating Income (Millions of Yen)



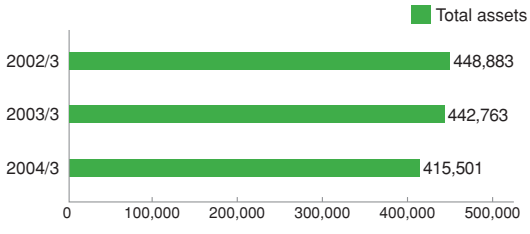
■Net Income (Millions of Yen)



■Sales Composition Ratios by Operating Division



■Total Assets (Millions of Yen) – Consolidated



Shun Matsushita
President and
Chief Operating Officer
松下 雋

Contributing to Environmental Conservation Through Even More Advanced Green Management

Is the society accelerating towards achieving the creation of a sustainable recycling-based society? When seen from a global perspective, the road toward solving environmental problems such as global warming does not yet appear to be in sight. However, it is also true that many measures aimed at environmental conservation are proceeding at remarkable speed and in many regions.

Together with the preparation of regulations in countries and regions around the world, and with the implementation of the Kyoto Protocol, we are seeing the development and application of a variety of new technologies. In this way, scientific technologies, which on one hand have been a cause of these environmental problems, are now being reborn as one method for their resolution.

In our new three-year management plan instituted in April 2002, we have implemented Green Management as an action guideline, and we are witnessing steady results. For example, ceramic products used for the purification of air and water pollution are being very well received in the marketplace. Additionally, NAS® batteries are being adopted as an indispensable technology for future energy systems. We are aware that in the future our contribution to society through providing products and technologies that reduces environmental impact in our four operating divisions – the Power Business Group, the Ceramic Products Business Group, the Engineering Business Group, and the Electronics Business Group – is directly connected to our development as a business, and we are further enhancing our efforts to this end.

As regards reducing the environmental impact in our production activities for 2003, we were for the most part successful in meeting our goals, but an increase in production led to results that we are not completely pleased with. Nonetheless, our efforts in achieving zero emissions led us to a significant 1,500-ton reduction in outsourced processing compared with 2002. In management of chemical substances, we are continuing to reduce the amounts that we handle, and are aggressively working toward disclosure of information. We are continuing with stricter adherence to regulations, and with the implementation of green purchasing. We are presently studying actions that will take us to the next stage.

Meanwhile, one characteristic of our business is the firing process in production, and so reducing quantities of CO_2 emissions, which continues to be a major issue. Overall emissions quantities have plateaued, and while we have absorbed the quantities resulting from increases in production, continued efforts are still required. Consequently, in 2003, we formulated "Project E," which aims at achieving reductions of 7% in CO_2 emissions from 1990 levels by 2010, and are working toward overall improvements through more thorough energy reductions, the application of existing technologies, and the study and implementation of leading technologies.

For us as a business that is expanding globally, an integrated environmental management system for the NGK group that includes overseas locations is one of the key issues. As an important aspect of this, we are making renewed efforts toward acquisition of ISO 14001 certification.

Carrying out our social responsibilities and communicating with society are both essential obligations. Our engagement with Expo 2005 Aichi Japan is an important issue, and we are actively making efforts in cooperation with government and other businesses.

NGK will continue to work to obtain broad-based understanding and cooperation through our Environmental and Social Responsibility Report, as well as vigorously promoting activities aimed at achieving corporate excellence based on global standards.

NGK – Conserving the Environment and Contributing to Society

NGK's business activities that create products based on the Company's own innovative ceramics technologies are contributing to reducing environmental impact. Under our 2002 Three-year Management Plan, NGK is dealing with the newly raised issue of Green Management to strengthen responses to global environmental issues, and promoting reductions in the environmental impact of the full range of business activities from development and design to procurement, manufacturing, and logistics. At the same time, NGK fulfills its social responsibility, including strict adherence to laws and regulations and making contributions to society. Through these efforts, NGK strives to achieve corporate excellence based on global standards.

Corporate Philosophy

"NGK products and technologies must create new value and contribute to the quality of life."

NGK Group Guidelines for Corporate Behavior (Excerpt)

■Relationship with Society

In pursuit of more openness from management, NGK Group will improve its communication with society, and, as a good corporate citizen, will increase its contribution to the enrichment of society.
For continuous operation of the Company, NGK Group finds it essential to tackle environmental problems, and will actively deal with such issues.

■Relationship with Business Activities

NGK Group will develop safe and valuable products to meet any future social demands and satisfy customers all over the world with those products. Throughout its business activities, NGK Group consistently obeys the letter and spirit of the law and conducts its business transactions fairly, transparently, and freely. As a member of the international community, NGK Group respects regional cultures and customs and seeks to coexist with local communities. Profits earned through legitimate business activity are appropriately returned to shareholders.

■Relationship with Employees

NGK Group will always value people and show respect for basic human rights. All employees must obey labor laws and regulations as well as corporate regulations.
Simultaneously, they must work responsibly and in good faith, and endeavor to enhance their own abilities.

2002 Three-year Management Plan

Speedy

Speedy Management

Together with ground-up revision of the processes for all tasks, NGK is making active use of new information tools and management methods to carry out the management decisions of the globally growing NGK Group even more rapidly.

Timely

Concentration on Development

With ceramics technology positioned as a key technology, NGK is maintaining investment in research and development within the "Triple-E" business fields at around 6% of sales. The Company is striving to achieve strategic growth through the timely development of new products.

Lean

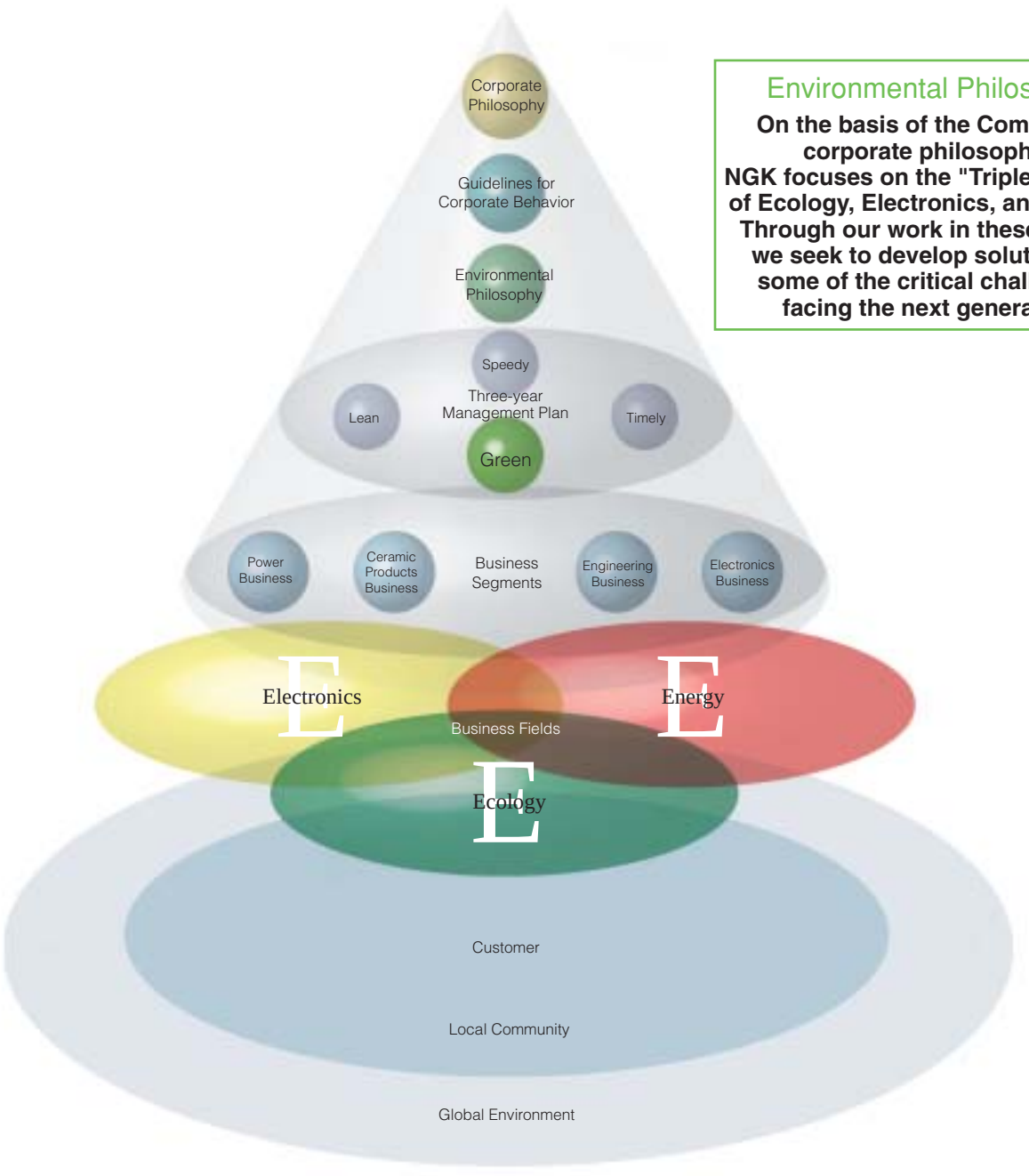
Highly-efficient Management

Aiming for a return on equity (ROE) of 10%, NGK is taking thorough steps to slim down assets through such measures as introduction of supply-chain management (SCM) and integration of equipment. The Company is further accelerating the utilization efficiency of management resources (personnel, property and funds).

Green

Green Management

In order to fulfill its responsibility to maintain corporate excellence, NGK makes every effort to reduce the impact of its business activities on the global environment through such actions as measures to prevent global warming, recovery of resources from by-products, development of environmentally conscious products, and improvement in the quality of environmental management.



Environmental Philosophy

On the basis of the Company's corporate philosophy, NGK focuses on the "Triple-E" areas of Ecology, Electronics, and Energy. Through our work in these areas, we seek to develop solutions to some of the critical challenges facing the next generation.

NGK's Four Business Segments

Power Business

NGK offers high-quality products in the area of electrical energy, such as the production of insulators for reliable power supply.

Ceramic Products Business

NGK offers leading-edge products based on innovative ceramics technology that support the growth of a diverse range of industries.

Engineering Business

Aiming for harmony between people and nature, NGK offers a wide array of facilities such as environmental conservation-related plants that protect people's lives and the environment.

Electronics Business

The electronics field continues to enjoy dizzying change and growth, and in this area as well NGK is making full use of fine ceramics technology to offer advanced products.

Environmentally Conscious Technologies and Products

NAS® Batteries

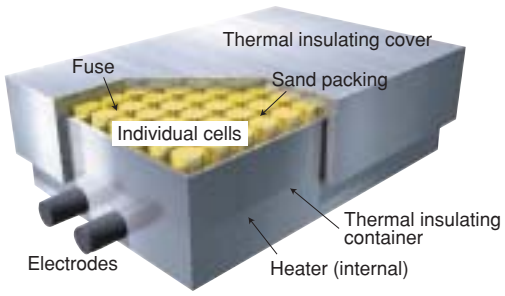
(1) Individual NAS® (sodium sulfur) battery cells within a modular battery.
(2) Production process for the beta alumina tubes used in NAS® batteries.

NAS® Batteries, to Be Introduced at Expo 2005

The World Exposition in Aichi, Japan (Expo 2005 Aichi, Japan), which will open in March 2005, will include the introduction of the world's first energy supply system combining solar power and fuel cell power generation. NGK is cooperating with the Japan Association for the 2005 World Exposition in the use of such experimental systems during Expo 2005. The electricity generated using solar and fuel systems that will ensure a stable energy supply within the venue is to be managed by applying the NAS® battery system.

The NAS® Battery System – For Efficient Energy Storage

NAS® batteries operate at high temperatures and consist of sodium at the negative electrodes and sulfur at the positive electrodes. For the electrolyte, the batteries use solid beta alumina ceramic, which is a good conductor of sodium ions. NGK's use of its unique ceramic materials and manufacturing technologies have led to the first commercial implementation of this system. The energy density of the NAS® battery is about three times that of conventional lead acid batteries, and as there is no self-discharge, this means highly efficient electricity storage and long-term durability.



Modular battery construction

Operation Launched for the World's First Large-scale NAS® Battery System

The world's largest NAS® battery system (8,000 kW) has been implemented at the power generating facilities of the Morigasaki Treatment Center for the Bureau of Sewerage, Tokyo Metropolitan Government, which began operation on April 1, 2004. This system uses four NAS® battery systems of 2000 kW capacity each, and achieves load balancing by storing cheap night-time power and using it to offset expensive day-time power. Here, at the largest wastewater treatment center in the country, this is playing a part in bringing about reductions in energy usage costs, quantities of fossil fuels used and hence CO_2 emissions.

Environmentally Conscious Technologies and Products

Diesel Particulate Filter (DPF)

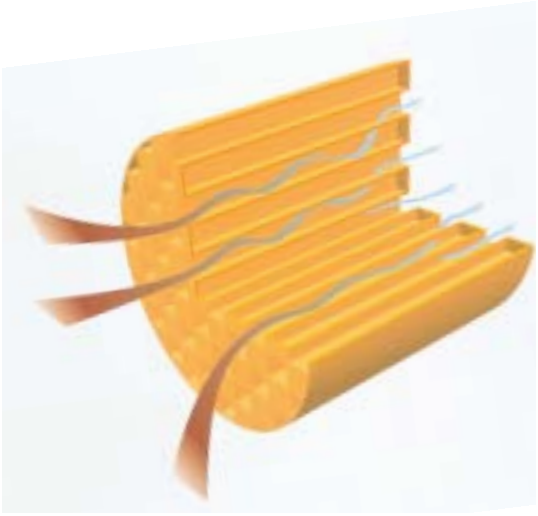
(1) DPF
(2) Inspection process for DPF

DPF, Lauded by Automobile Manufacturers

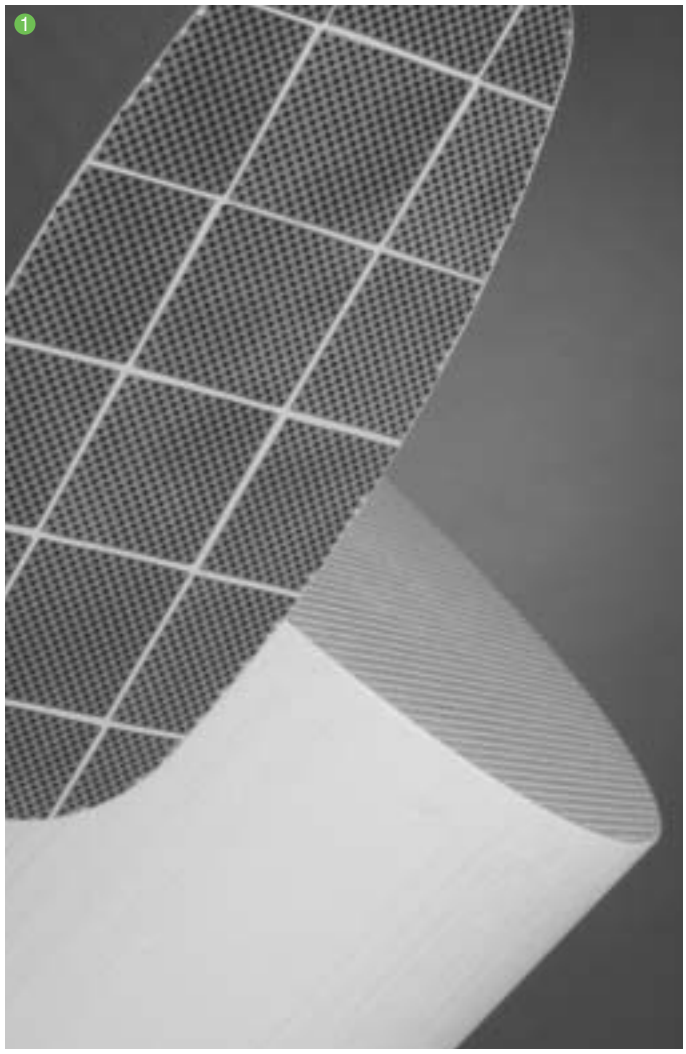
NGK has used its unique "HONEYCERAM"® technology, developed for use in gasoline vehicles, to develop a filter to collect fine particulates emitted from diesel engines. This development has resulted in NGK receiving technical development awards from Toyota Motor Corporation in February 2003 and from Hino Motors, Ltd. in March 2003. Both hailed the development of a DPF using cordierite. VW, BMW, and Mazda Motor Corporation are already using a silicon-carbide DPF in their passenger and small commercial vehicles, and DPF continues to win high praise.

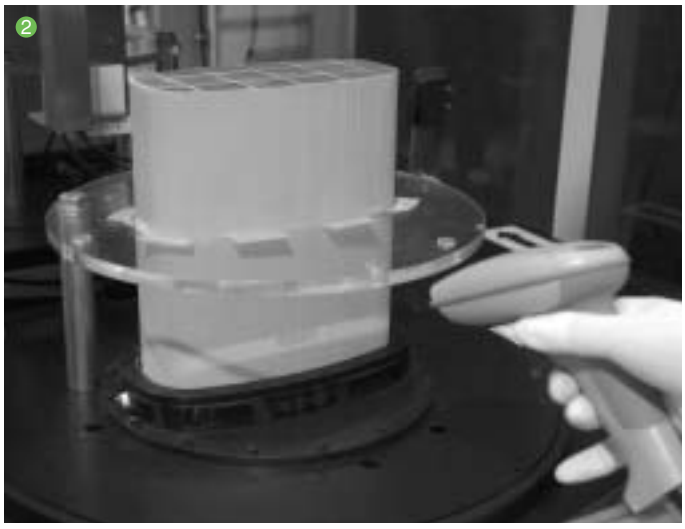
Structure and Functionality of DPF

By alternately plugging both ends of the honeycomb ceramic, the walls of the ceramic can be used as filters, meaning that more than 90% of particulate matter (PM) contained in diesel emissions can be removed. Recently, the application of a catalyst to the surface of the DPF means that this is being used in an emissions gas purification system that removes PM, and at the same time, simultaneously and continuously removes harmful elements such as nitrous oxide (NOx).



View of DPF





Expanding Demand and Redoubled Manufacturing Capacity for DPF

Future demand for DPF is expected to rise dramatically as emission controls around the world become increasingly strict. To accommodate this increase in demand, NGK is pushing forward with establishing mass-production facilities both in Japan and overseas, and at present we are investing in our production facilities overseas. We are establishing a supply system on a global scale through measures that include increasing production capacity in China and building new facilities in Poland.

Overall Perspective of Environmental Impact

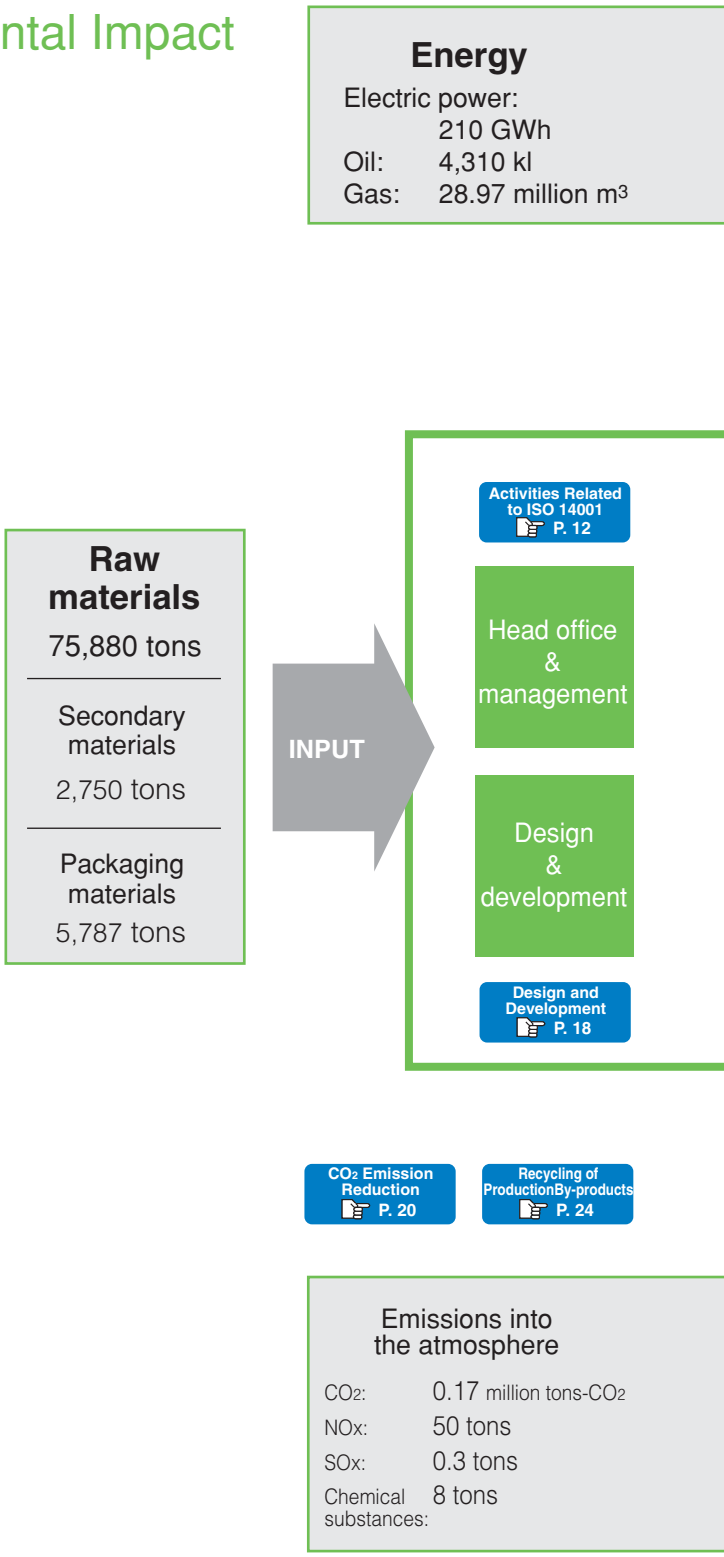
In our four business groups of Power, Ceramic Products, Engineering, and Electronics, NGK conducts product development and design, procuring components, raw materials, and other items, and manufacturing and selling products. At right is a material flow chart that shows the input of materials and energy in business activities, and the output of emissions and products into the environment.

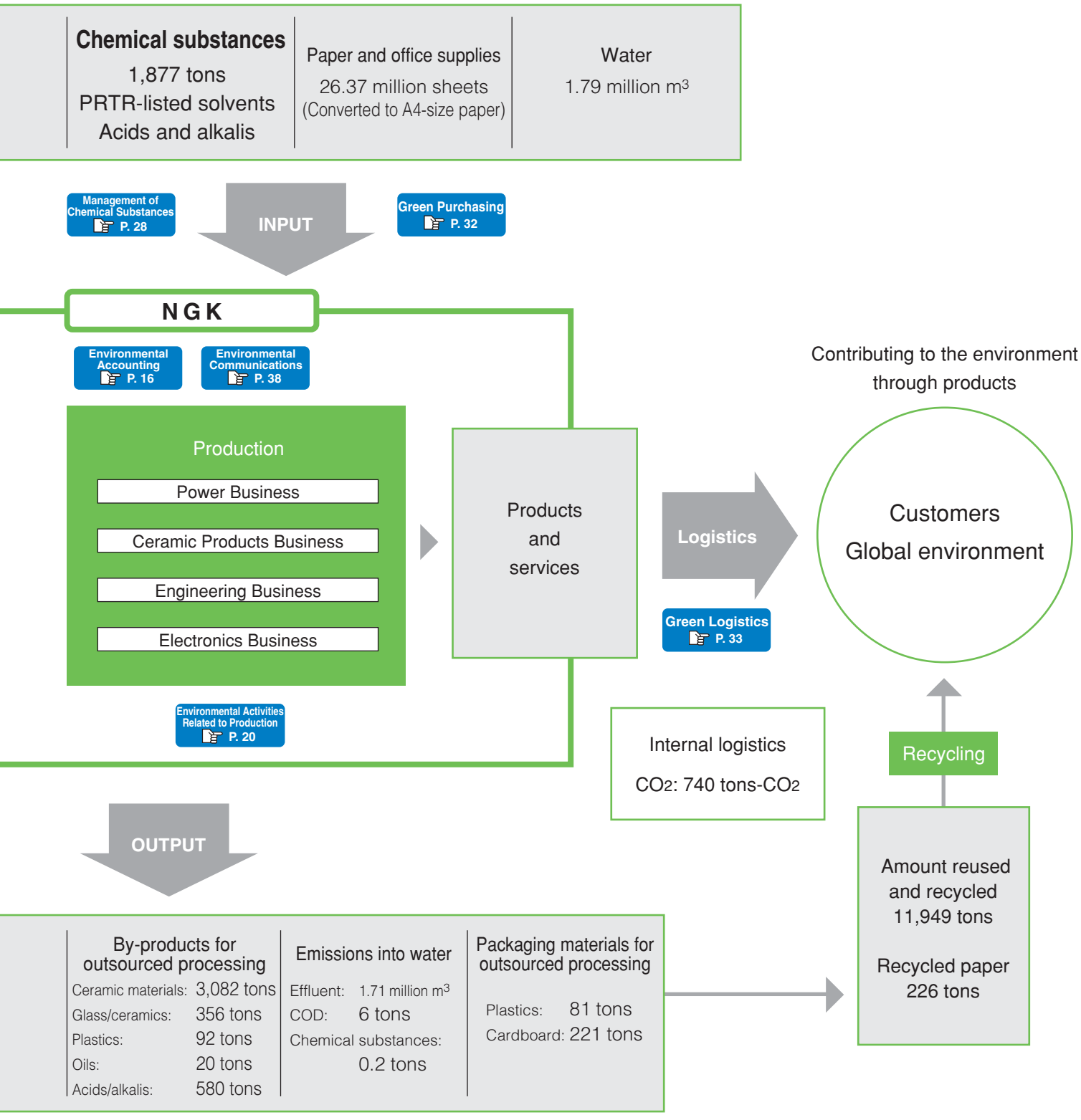
Overview of Input

Input comprises a large amount of raw materials and energy used in production activities, with the majority of these materials used in ceramics production. Company-wide energy saving activities are an important business challenge, to both reduce CO_2 emissions, due to their direct link to global warming, and to reduce costs. Additionally, chemical substances comprise a significant ratio of inputs. The Company is carrying out strict and proper management in their handling, and is also working to reduce the quantities used. In the area of fossil fuel usage for logistics in input, NGK is aiming to reduce the impact on the environment through the employment of efficient operating systems.

Overview of Output

Output comprises emissions of CO_2 into the atmosphere and industrial effluent into public bodies of water. These are a result of production activities, and the Company is making efforts to reduce and curtail both of these. What is more, the reduction and recycling of ceramic materials and other by-products generated in the course of manufacturing are major issues in business operations. Therefore, while aiming to reach the 2005 target of zero emissions, the Company is planning further measures. Many of NGK's products and technologies contribute towards reducing the impact on the environment, and it will continue to be an important mission for us to develop products and technologies that contribute to a better environment.
Moreover, within the Company, it is beholden upon us to implement enhanced environmental conservation activities throughout all of our business activities, including appropriate operation of environmental management systems in manufacturing processes and management areas.





Data from Nagoya, Chita, and Komaki plants

NGK's Core Policy on the Environment

NGK views global environmental conservation as one of the most important issues currently faced by mankind, and strives to be a company in harmony with nature.
In line with NGK's Core Policy on the Environment, established in April 1996, the Company will continue its business activities in the "Triple-E" business fields of Ecology, Electronics, and Energy. In addition to reducing the environmental impact of its business activities, NGK will actively contribute to a better environment through the development of products and technologies that benefit the environment.

Philosophy

NGK's positive approach to the environment begins with its basic corporate philosophy: "NGK products and technologies must create new value and contribute to the quality of life." In particular, we focus on the "Triple-E" areas of Ecology, Electronics, and Energy. Through our work in these areas, we seek to develop solutions to some of the critical challenges facing the next generation.

Action Guidelines

In the Design Review (DR) process, NGK first scientifically evaluates the impact of its production technologies, anti-pollution measures, and waste treatment systems on the environment. Based on our findings, we then take appropriate measures.

Specifically, we aim to:

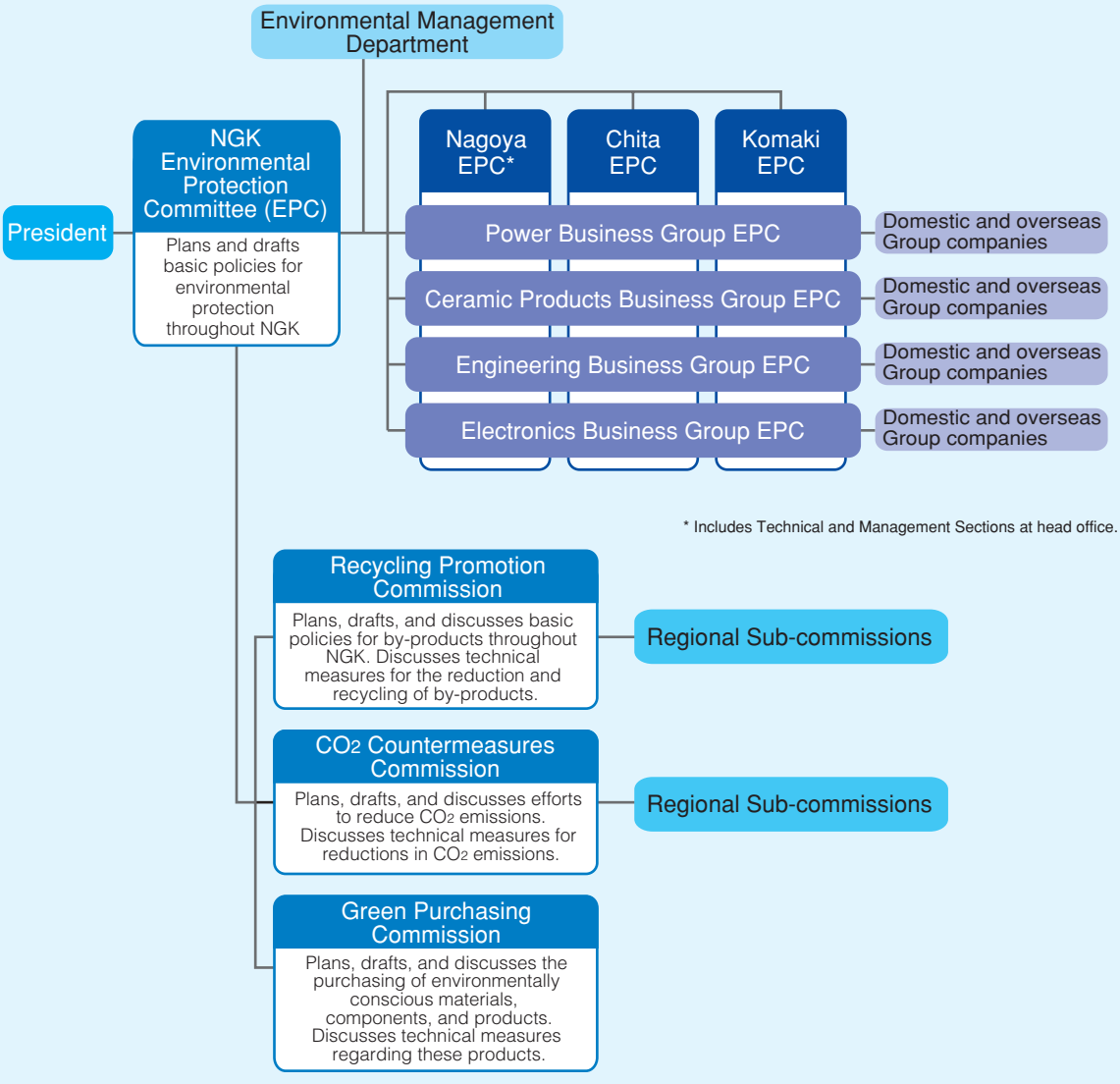
1. **Improve the environmental management system;**
2. **Reduce industrial waste by promoting resource conservation and recycling;**
3. **Promote energy conservation and reduce CO_2 emissions;**
4. **Give preference to the purchase of environmentally friendly materials, parts, and products;**
5. **Improve environmental awareness among NGK employees, through educational and informational activities; and**
6. **Begin the Life Cycle Assessment (LCA) of products, in an effort to reduce their environmental impact.**

History of NGK's Commitment to Environmental Activities

Apr. 1972	Environmental Protection Committee and Environmental Preservation Office established
Jun. 1992	Waste Countermeasures Commission established
Mar. 1993	NGK's Voluntary Plan for Environmental Conservation established
Dec. 1994	Chlorofluorocarbons (CFCs) and 1,1,1-trichloroethane abolished
Feb. 1995	Internal environmental audit conducted
Apr. 1996	NGK's Core Policy on the Environment established
Dec. 1996	CO_2 Countermeasures Commission established
Mar. 1998	NGK's three production bases simultaneously received ISO 14001 certification
Mar. 1999	Environmental Report published
Apr. 1999	Environmental accounting introduced
Jun. 1999	Engineering Business Group received ISO 14001 certification
Oct. 1999	Green Purchasing Commission established
Nov. 1999	Environmental surveys of domestic group companies started
Feb. 2000	Environmental Partnership Club (EPOC) established and active participation therein begun
Oct. 2000	Chemical Substances Safety Committee established
	Chemical Substances Management System introduced
Mar. 2001	Five-year Environmental Action Plan established
Apr. 2001	Compilation of environmental performance data for domestic Group companies started
Oct. 2001	Operation of Recycling Yard begun
Jan. 2002	Compilation of environmental performance data for overseas Group companies started
Apr. 2002	New "Green Management" three-year management plan instituted
Apr. 2003	Moves made toward a full business group environmental management system
Apr. 2003	"Waste Countermeasures Commission" renamed "Recycling Promotion Commission," and "wastes" renamed "by-products"

Promotion System for Environmental Management

To promote even more effective efforts with respect to environmental issues, NGK further strengthened its environmental management system in 2002, and in 2003, we used a new system in striving to confront environmental issues.
In addition to environmental management systems created along plant lines, the Company has enhanced green management organized along business-group lines. This enables individual business groups to respond more effectively, together with NGK's group companies and cooperating companies, to their specific environmental issues such as reducing CO_2 emissions, reducing and recycling by-products, and enhancing management of chemical substances. These result from procurement of raw materials and resources, and from the development, production, logistics, and sale of products.
In the future, we will further improve Green Management systems in each business group, as well as environmental management systems at each plant, letting us enhance our efforts to protect the environment.



NGK's Environmental Action Plan

NGK's Voluntary Plan for Environmental Conservation was established in March 1993, and NGK's Core Policy on the Environment was established in April 1996. In addition to encouraging environment-related activities, these have helped the Company address environmental issues in the "Triple-E" business fields of Ecology, Electronics, and Energy.

Item			Environmental Action Plan 2001	2002	2003	2004	2005	Target
Internal Environmental Activities	Environmental Management	Environmental Management	Establishment and effective operation of ISO 14001, consolidation of environmental management for domestic and overseas Group companies					1. Establish and improve ISO 14001 (1) Legal compliance: no violations in external audits (2) External audits: no major faults (3) Strengthen environmental impact reduction measures (4) Continue internal environmental education, development, and communication 2. Provide support for environmental management at domestic and overseas Group companies (1) Approaches to Business Group environmental management (2) Environmental performance analysis and issue definition
		Environmental Accounting (EA)	Evaluation based on cost effectiveness		Incorporation of EA into business activities, streamlining			1. Improve utility of EA - Calculate and track costs and effects on an operating division basis - Establish internal management indicators 2. Expand cost computation system (linked to accounting system)
	Life Cycle Activities	LCA		Investigation		Testing	Tool implementation	Expand tests
		CO_2	Restraining basic unit (total amount/sales) to within 1990 levels (70 tons-CO_2/¥100 million)			Total emissions reduction target 0% change in 2006 over 2003 7% reduction in 2010 over 1990		1. Maintain rate of emissions per unit sales at 1990 levels 2. Study total emission reductions targets and develop plans 3. Promote energy conservation activity in business groups; reduce by 2% from 2002 4. Investigate processes with low environmental impact
		By-products	Reduction of outsourced processing by 50% from 2000 levels			Zero emissions		1. Reduce quantities of ceramic raw materials, glass, and ceramics for outsourced processing Outsourced processing amount of 3,300 tons or less 2. Promote recycling Recycling rate no less than 66% 3. Reduce amount of acids and alkalis for outsourced processing by 50% from 2000
		Chemicals	Introduction and establishment of management system			Elimination, use of substitute materials, reduction of emissions into environment		1. Strengthen management of PRTR-listed substances 2005 target: Reduce atmospheric emissions of solvents to less than 20% of 2000 levels 2. Streamline the Chemical Substances Safety Committee and management system
		Green Purchasing and Logistics	Office supplies/ all-purpose equipment		Expansion to parts and materials Promotion of greening at suppliers			1. Explanatory meeting on environmental issues and green purchasing for suppliers 2. Implement green packaging guidelines 3. Expand application of green purchasing in office supplies and all-purpose equipment
External Environmental Activities	Environmental Communications	Communications	Publication of Environmental Report, community relations activities, etc.					1. Improve Environmental Report - Greater disclosure of environmental information 2. Continue dialogs between plants and surrounding communities - Hold local exchange meetings and improve content - Offer plant tours
		Participation in NPO activities	Participation in the Environmental Partnership Organization Club (EPOC)					Promote activities of the Exchange Promotion Committee (1) Exchange with local communities (Nagoya City, universities, etc.) (2) Educational activities (support for school educational programs on the environment, exchange with overseas trainees, etc.)

Note: NGK Environmental Action Plan is centered on its three plants in Nagoya, Chita, and Komaki, but the details of the Environmental Management items sho and overseas Group companies. Also, Environmental Accounting includes domestic Group companies.

At present, we are further promoting and expanding environmental activities based upon the Five-year Environmental Action Plan that was formulated in March 2001. Furthermore, we are enhancing Business Group environmental management, including at our group companies both within Japan and overseas in order to assist the environmental management set out in "Green Management," one of the action guidelines of the 2002 three-year management plan.

2003 Achievements		2004 Targets	See page
Achievement	Self-evaluation		
1. Strengthened environmental management (1) Legal compliance: no violations (2) ISO 14001 external audits: no major faults (3) Made positive progress on 23 development and design themes (4) Internal education, education in legal compliance and for internal auditors 2. Conducted environmental performance survey of domestic and overseas Group companies - Implemented environmental performance survey (16 items) at domestic Group companies and environmental hearings by each operating division - Environmental performance survey (12 items) at overseas Group companies	○	1. Establish and improve ISO 14001 (1) Strengthen environmental management in administrative divisions (2) Legal compliance: no violations in external audits (3) External audits: no major faults (4) Strengthen environmental impact reduction measures (5) Continue internal environmental education, development, and communication 2. Provide support for environmental management at domestic and overseas Group companies (1) Approaches to Business Group environmental management (2) Environmental performance analysis and issue definition	P.12
1. Improve utility of EA (1) Implemented calculation of costs and effects on an operating division basis (2) Implemented case study to specify internal management indicators 2. Introduced a cost computation system linked to the accounting system for repair costs, in addition to that for general expenses and material purchase costs implemented in 2002	○	1. Improve utility of EA - Calculate and track costs and effects on an operating division basis 2. Expand coverage of calculation - Calculate and track costs and effects for domestic and overseas Group companies	P.16
Distribution of CO_2 load from in-house manufacturing process of insulators and HONEYCERAM® determined, data acquisition and analysis methods studied, and study of partial LCA data use started	○	Continue to expand tests	P.18
1. Basic unit (total amount/sales) increased 4% over 2002; total emissions increased 2% Emissions index for 4 key products increased 1.5 points 2. Set total emission reductions target and developed plans 3. Strict adherence to Energy Management Standards – 100% implementation Implemented complete shut down of clean rooms on holidays and at night, and implemented energy saving measures to ensure correct operation of air conditioning facilities 4. Commenced a study into technologies to make direct use of waste heat from kilns Commenced cooperative research with the National Institute of Advanced Industrial Science and Technology into development of materials for low-temperature firing and other technologies (April 2003 through March 2006)	△	1. Implement total emissions reduction plans 2. Promote energy conservation activity in business groups 3. Investigate and introduce processes with low environmental impact 4. Improve energy management for buildings and specified facilities	P.20
1. Outsourced processing amount 4,200 tons (reduced by 1,336 tons from 2002) 2. Outsourced recycling amount 13 times larger than 2002, recycling rate 74% 3. Outsourced processing amount of acids and alkalis by-products reduced by 43% from 2000	○	1. Reduce quantities of ceramic raw materials, glass, and ceramics for outsourced processing Outsourced processing amount 1,500 tons or less 2. Promote recycling Recycling rate no less than 74% 3. Commence study of moving from management of outsourced processing amount to management of total production amount	P.24
1. Amounts of atmospheric emissions of solvents reduced by 98% from 2000 – target achieved 2 years ahead of schedule 2. Created an independent management system for laboratories; streamlined the system by reviewing its data	◎	1. Strengthen management of PRTR-listed substances in accordance with amended regulations Improved leakage countermeasures 2. Streamline the Chemical Substances Safety Committee and management system 3. Review of examination criteria in accordance with EU regulations	P.28
1. Classified relevant suppliers Classified suppliers (approx. 350) that purchase and sell materials, parts, or products 2. Employed green packaging guidelines (requested implementation at 900 companies) 3. Expanded application of green purchasing to 1,570 products. Continued Green Power purchase (2 million kWh/year)	○	1. Establish Green purchasing guidelines; hold explanatory meeting on environmental issues and green purchasing for suppliers 2. Solidly establish green packaging guidelines 3. Expand application of green purchasing to manufacturing materials, etc.	P.32
1. "Environmental Report" renamed "Environmental and Social Responsibility Report" - Expanded range of environmental information disclosure, including for domestic and overseas Group companies - Commenced disclosure of information regarding social issues 2. Dialogs held between plants and surrounding communities - Local exchange meeting held (introduction of environmental activities, plant tour, Summer Festival (2000 participants)) - Volunteer clean-up programs for local area held 4 times/year	○	1. Improve Environmental and Social Responsibility Report 2. Continue dialogs between plants and surrounding communities - Hold local exchange meetings and improve content - Offer plant tours - Participation in Reciprocal Study System for Environmental Promotion (Re-STEP)	P.38
1. Participated in Clean Campaign Nagoya, and Eco-Campus Festival 2. Exchange with overseas trainees	○	Promote the activities of the Exchange Promotion Committee (1) Participate in Expo planning, eco-talk sessions, backyard tours (2) Exchange with local communities (Nagoya City, universities, etc.), exchange with overseas trainees.	P.38

own here include domestic

Self-evaluation results: ◎ Achieved target ○ Significantly exceeded target △ Little year-to-year change × Worse than previous year

Activities Related to ISO 14001

As part of the Company's efforts to develop long-term and Company-wide environmental conservation activities in line with NGK's Core Policy on the Environment, continuing efforts are being made to acquire ISO 14001 certification. In March 1998, NGK's three main domestic production bases simultaneously received ISO 14001 certification, and by March 2004, nine business sites at domestic Group companies, and six at overseas Group companies also received certification. As of 2003, there were 13 domestic and 16 overseas consolidated companies. We are working to expand this coverage promptly to our new sites, and by 2005, all business sites are scheduled to complete their certification.

NGK Group ISO 14001 and Corresponding Certifications (Overseas Included)

●: Acquired (FY)

Business sites				2001	2002	2003	2004	2005
NGK Insulators, Ltd.			Nagoya Plant (including Engineering Business Group and R&D section)					
			Chita Plant					
			Komaki Plant					
Domestic Group companies	Power Business		Energy Support Corporation, Main Plant					
			Akechi Insulators Co., Ltd., Akechi and Matoba plants	●				
	Ceramic Products Business		Ikebukuro Horo Kogyo Co., Ltd.				●	
			NGK Filtech, Ltd.				●	
			NGK Adrec Co., Ltd.					
			NGK Kilntech Corporation					●
			Heisei Ceramics Co., Ltd.					●
	Electronics Business		NGK Mettex Corporation					●
			NGK Fine Molds, Ltd.					●
			NGK Optoceramics Co., Ltd., Komaki Plant	●				
			NGK Printer Ceramics Co., Ltd.	Komaki Plant/Yamanashi Plant	●			
			NGK Okhotsk, Ltd.		●			
		Soshin Electric Co., Ltd.	Asama Plant					
			Chikuma Plant	●				
			Miyazaki Plant	●				
Overseas Group companies	Power Business		Locke Insulators, Inc.				●	
			NGK-Locke Polymer Insulators, Inc.				●	
			NGK Europe S.A.				●	
			P.T. WIKA-NGK Insulators		●			
			NGK Stanger Pty. Ltd.				●	
			NGK Insulators Tangshan Co., Ltd.	●				
	Ceramic Products Business		NGK Ceramics USA, Inc.	●				
			NGK Ceramics Europe S.A.	●				
			P.T. NGK Ceramics Indonesia				●	
			NGK Ceramics Suzhou Co., Ltd.					●
			Siam NGK Technocera Co., Ltd.					●
			NGK Technocera Suzhou Co., Ltd.					●
			NGK Ceramics South Africa (Pty) Ltd.	●				
	Electronics Business		NGK Metals Corporation			●		
			NGK Berylco France					●
			FM Industries, Inc.					●

Activities at Overseas Group Companies

Here we introduce three overseas Group companies that have received certification; NGK Ceramics South Africa (Pty) Ltd., NGK Metals Corporation, and P.T. WIKA-NGK Insulators. All three of these Group companies are pursuing environmental conservation activities in line with the requirements of their respective countries or regions, and are continuously seeking improvements in their environmental management systems.

NGK Ceramics South Africa (Pty) Ltd.

NGK Ceramics South Africa (Pty) Ltd. (ACS) received certification (passed inspection) under the international standard for environmental management systems (ISO 14001) on August 20, 2001.
ACS was established at the southernmost tip of Africa, in Cape Town, South Africa, and is the fifth overseas production base for HONEYCERAM®. It commenced volume production in January 2001.
In keeping with the government's strict implementation of environmental protection measures, a condition for obtaining an operating permit was the early acquisition of ISO 14001 certification. From an early stage, ACS established an environmental management system and carried out training activities for all employees, and this resulted in their passing the certification inspection in a mere six months after commencement of volume production. That was a record time for attaining this certification in the region.
May 2004 will see the company undergoing an inspection for renewal of their certification.

Environmental Policies

1. Comply with all relevant laws,regulations and agreements with government offices, taking into account all requirements such as mother company and the ISO standard.
2. Introduce, maintain, and enhance an internationally certified environmental management system.
3. Reduce industrial waste by promoting prevention of pollution, resource conservation and recycling.
4. Promote energy conservation.
5. Give preference to purchasing environmentally friendly materials, parts and products.
6. Improve environmental awareness among NGK employees.

ACS staff engaged in environmental management activities

NGK Metals Corporation

NGK Metals Corporation's Sweetwater Plant (in Tennessee, U.S.A.) received certification under the international standard for environmental management systems (ISO 14001), in December 2003.
NGK Metals conforms to NGK's environmental policies, and as a member of the international community, is putting all its efforts into environmental conservation. The company will take the opportunity of receiving ISO 14001 certification to implement measures that take the environment into account wherever possible, and is pursuing ongoing improvements.

NGK Metals Corporation

Environmental Policies

1. Comply with all federal, state, local, and NGK environmental standards and strive to go beyond compliance.
2. Accomplish prevention of pollution through continuous improvement in minimizing, reusing, and recycling waste generated in the manufacturing of our products.
3. Be committed to environmental protection, and dedicate the necessary resources to carry out this policy.

P.T. WIKA-NGK Insulators

P.T. WIKA-NGK Insulators has expanded into the international market since 1997. Consequently, ensuring environmental conservation is an essential condition to provide customer satisfaction on the global market. P.T. WIKA-NGK Insulators employs the ISO 14001 environmental management system, and on August 28, 2002 received that certification from KEMA (ISO certification body, the Netherlands). This is a more complete and rational system that combines ISO 9001: 2000 and ISO 14001.

Quality and Environmental Policies

As a world-class product, PT WIKA-NGK Insulators aims to satisfy customers and to preserve the environment by consistently adhering to the following objectives.

1. Producing high-quality products and services to ensure the customer's satisfaction.
2. Complying with government regulations relevant to production activities and the company's products and services.
3. Minimizing significant environmental impact by reducing, re-using, and conserving the company's resources.
4. Ensuring that the workers have the awareness, ability, and knowledge to implement the quality and environmental management system.

All employees have a responsibility to actively participate in ongoing activities to improve systems.

Main Activities Related to ISO 14001

1. Comply with government regulation concerning the environment.
2. Install a wastewater treatment plant to manage wastewater.
3. Create a Health & Safety Committee, etc.

Future Prospects

We will conduct continuous improvements in our ISO 14001 implementation.

1 Achieve zero accidents by increasing safety awareness and training.
2. Reduce solid waste by increasing product yield ratios.
3. Change air conditioners to non-CFC ones to protect the ozone layer.
4. Optimize electricity, water, and gas consumption as part of resource conservation.

Environmental Auditing

Even before ISO 14001 certification, NGK performed its own internal environmental inspections, working to improve its environmental conservation activities. Today, 157 internal auditors are assigned to our various departments, performing audits once a year.
Additionally, in 2003 the Nagoya, Chita, and Komaki plants had their second inspection for renewal since receiving their ISO 14001 certification. At the Komaki Plant, coverage for this renewal was expanded to include the NAS® battery plant and SiC-DPF plant newly constructed in 2003. Furthermore, the external audit showed no major faults.

Environmental Risk Management

In keeping with NGK's Core Policy on the Environment, the Company is working to upgrade its environmental management structures and prevent accidents through efforts geared toward preventing water, air, and other types of pollution. In addition, we have taken all necessary measures, including providing emergency response education and training, in preparation for the occurrence of an accident.

Strict Adherence to Legal Restrictions

In keeping with NGK's Core Policy on the Environment, each of our plants is working to achieve strict adherence to relevant legal restrictions as well as environmental categories that have been agreed upon with supervising government agencies. Furthermore, NGK forms pollution prevention agreements with local government bodies where NGK's business sites are located and implements independent measures to prevent pollution in accordance with autonomous standards that are even more stringent than legal restrictions.
In 2003, there were no instances in which NGK breached legal restrictions or standards. Also, the Company had no recorded instances of pollution-related lawsuits and received no pollution-related complaints from local communities.

Training for Emergencies

In preparation for an emergency, each of our business sites implements education and training based on an annual plan, with the aim of minimizing the spread of pollution in the event of an accident. In 2003, we carried out emergency response education and training that included emergency training for response to acid-washing effluent treatment incidents, and to abnormalities in water quality.

Major content:
Training in notification and communication in the event of an emergency
Acquisition of emergency response skills, and identification of problem areas through training

Education and Training Performance (2003)

Month implemented	Objective	Participants	No. of people
7	Nagoya photochemical smog emergency response training	Firing kiln and safety personnel	16
8	Komaki photochemical smog emergency response training	Firing kiln, boiler, and safety personnel	10
9	Chita atmospheric emission emergency response training	Construction personnel	19
9	Komaki abnormal water quality emergency response training	Water quality, construction, and safety personnel	19
9	Nagoya abnormal water quality emergency response training	Water quality, construction, and safety personnel	6
9	Chita abnormal acid-washing effluent treatment emergency response training	Construction personnel	4
11	Nagoya exhaust processing facility emergency response training	Firing kiln, construction, and safety personnel	6
12	Chita abnormal water quality emergency response training	Water quality personnel	2

Employee Education and Development

To protect the Earth's environment, it is essential for each individual employee to deepen his or her understanding of environmental issues and make conscious efforts to protect the environment. One of NGK's action guidelines under its Core Policy on the Environment is to carry out educational and public affairs activities to raise environmental awareness among employees. Thus, NGK continuously implements a wide array of environmental education and development activities.

Company-wide Education

At our plants, we offer education in environmental management systems to ensure that employees understand environmental policy and work to follow it. In addition, we distribute the Environment Cards, on which environmental targets for each division are listed, and each person records environmental declarations and strives to raise his or her awareness regarding the environment.

Environmental Education Performance (2003)

Month implemented	Contents of training	Participants	No. of people
7-8	Environmental management education in each site (manual revision)	All departments	All
10	Internal auditor training program	Personnel scheduled to become environmental auditors	30
11	Advance education for internal auditors	Internal auditors	20
11	Education in environmental law and regulation	Environment managers at Group companies	15
12	Education in environmental law and regulation	Nagoya Plant	90

Obtaining Various Qualifications

To continually improve the content and implementation of environmental protection activity based on the environmental policy, we are focusing on cultivating staff members who possess the necessary legal qualifications – including those for pollution control manager, energy manager, and certified environmental measurer – for the operation of each business site. We are also providing support that enables employees to obtain such environment-related qualifications as those for environment management system auditor.

Number of Employees with Environment-related Qualifications (as of March 31, 2004)

Qualification		No. of people	Qualification	No. of people
Senior pollution control manager		4	Energy manager	13
Pollution control manager	Air	64	Environmental certified measurer	5
	Water	104	Heat manager	10
	Noise	44	Specially controlled industrial waste manager	4
	Vibration	21	Intermediate waste disposal controller	6
	Dust	3	Final waste disposal controller	3
	Dioxins	10		

Environmental Accounting

In 1999, NGK introduced environmental accounting as one tool for managing and ascertaining the state of its environmental conservation activities.
The scope of consolidation was limited to costs (for NGK and domestic Group companies), but from 2002 it has been expanded to cover economic effects.

Analysis and Use of Tabulated Results

Environmental Costs

In 2003, the environmental costs of NGK's consolidated domestic Group companies (NGK's consolidated) increased approximately ¥740 million from 2002, to ¥3.3 billion. This figure included capital investment of ¥960 million (¥180 million more than in 2002) and ¥2.35 billion for expenses (¥560 million more than in 2002). Of these, NGK costs comprised ¥2.97 billion, approximately 90% of the total, with the total for domestic Group companies being similar to 2002 levels, at ¥330 million.
The increase in capital investment is as a result of the installation of pollution prevention equipment and resource recycling equipment. Pollution prevention equipment is comprised of denitration and deodorization equipment, and in order to promote resource recycling, NGK's consolidated has augmented its reuse and recycling facilities. These include those facilities for the recovery of copper sulfate used in metal washing and the reuse of metal-washing fluid.
This increase is because of increased development costs for technologies for low environmental impact, and an increase in the coverage of depreciation costs to respond to the cumulative effects of environmental capital investment.

Environmental Conservation Effects and Economic Effects

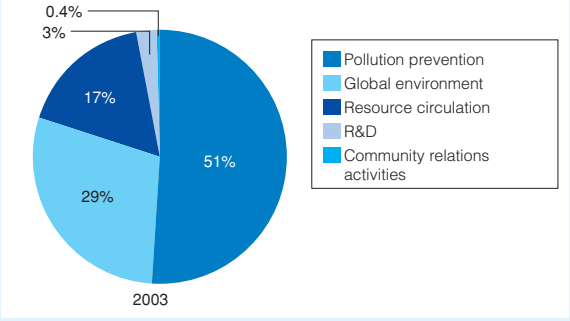
To determine these effects, we have calculated both the "environmental conservation effect" and the "economic effect." NGK has satisfied all relevant pollution prevention-related standards, and has not been cited for any incidents of violations. Total CO_2 emissions rose by just 2.0% over 2002, and the amounts of by-products from manufacturing processes and for outsourced processing were both reduced, and there was an increase in the recycling rate. The direct economic effect of environmental protection measures was ¥530 million. A significant economic effect of ¥230 million (equivalent to an 8,200 tons-CO_2 reduction from 2002 when converted to CO_2) was recognized as a result of energy savings; however, a reduction in the internal recycling rate such as reuse within processes, and in income from sale of by-products, has meant that there was drop of ¥90 million from 2002 in the overall economic effect.
The economic effect for domestic Group companies was ¥400 million, a ¥300 million increase over 2002, with the main causes for this being an increase in income from the sale of by-products.

Environmental Accounting Results (consolidated) (Figures in parentheses for non-consolidated results) (million yen)

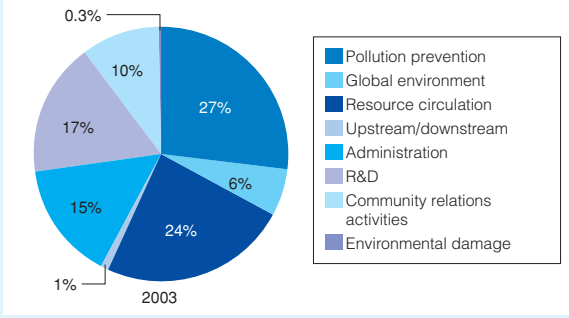
Cost		Capital investment				Expenses				Total			
		2002		2003		2002		2003		2002		2003	
Business area costs	Pollution prevention costs	283	(278)	476	(470)	550	(514)	576	(537)	833	(792)	1,052	(1,007)
	Global environment costs	423	(370)	280	(273)	79	(73)	128	(122)	502	(443)	408	(395)
	Resource circulation costs	33	(31)	171	(158)	493	(381)	599	(488)	525	(411)	770	(646)
	Total	738	(678)	927	(901)	1,122	(968)	1,303	(1,147)	1,860	(1,646)	2,230	(2,048)
Upstream and downstream costs		0	(0)	0	(0)	21	(16)	20	(20)	21	(16)	20	(20)
Administration costs		14	(12)	2	(0)	356	(279)	411	(311)	370	(291)	413	(311)
R&D costs		22	(22)	24	(24)	72	(63)	347	(346)	94	(85)	371	(370)
Community relations activity costs		8	(6)	4	(4)	209	(187)	244	(210)	217	(193)	248	(214)
Environmental damage costs		0	(0)	0	(0)	6	(6)	20	(6)	6	(6)	20	(6)
Total		781	(717)	957	(929)	1,787	(1,520)	2,345	(2,040)	2,568	(2,237)	3,302	(2,969)

Notes: Definition of Environmental Costs and Tabulation Methods: Environmental protection costs are categorized in accordance with guidelines set by the Japan Environment Agency. For domestic Group companies, the figures for 13 manufacturers were calculated.
Expenses for the development of such environemtally conscious products as water and sewage treatment equipment would naturally be incurred in the Company's normal business activities; these expenses are not included in the calculations.
Asahi Tec has been excluded from 2002 results for comparison with 2003.

Environmental Cost Capital Investment (Non-consolidated)



Environmental Cost Expenses (Non-consolidated)



Environmental Conservation Effects (Non-consolidated)

Effect	Category	Environmental conservation effects 2002	Environmental conservation effects 2003	Effects
Business area effects	Pollution prevention	Superior to standards; Number of violations: 0	Superior to standards; Number of violations: 0	—
	Volume of CO_2 emissions (tons-CO_2) Basic unit (total amount/sales) (tons-CO_2/¥100 million) Basic unit (total amount/production) (%)	162,279 82.5 97.0	165,578 85.8 98.5	Increase of 2.0% over 2002 3.3 tons-CO_2 increase over 2002
	Volume of by-products generated (tons) Volume of by-products recycled Volume of outsourced disposal	16,433 10,866 5,547	16,160 11,949 4,211	Amount generated: Decrease of 1.6% Recycling rate: Increase of 7.8% Amount outsourced: Decrease of 1,336 tons
	Volume of water consumed (10,000 m^3)	197	179	Reduced consumption by implementing water leakage countermeasures and installing water conservation facilities
Other	ISO-related	Introduction of "Positive Environmental Effect Evaluation System"* to R&D and design divisions to promote development of processing, products, and facilities that contribute to the social environment		—

* Positive Environmental Effect Evaluation System: NGK system in which positive effects contributing to the reduction of the impact on the environment of R&D or design themes are evaluated and those which are highly evaluated are followed up on by those responsible for environmental management

Economic Effects (Non-consolidated)

Category	2002 Economic effects (¥ million)	2002 Reduction volume	2003 Economic effects (¥ million)	2003 Reduction volume
Energy conservation*1	103.2	3,892 tons-CO_2	228.9	12,080 tons-CO_2*2 (8,238 tons-CO_2 in a single year)
Resource conservation (water)	0.27	3,000 m^3 (Industrial water)	0.25	800 m^3 (City water)
Resource conservation (raw materials)	251.5	2,008 tons (Increased reuse rate for the material, etc.)	118.1	550 tons (Increased reuse rate for the material, etc.)
Resource conservation (packaging)	3.9	(Returnable pallets, etc.)	40.4	(Returnable containers, returnable pallets)
Reduction in outsourced processing of by-products	58.7	4,836 tons	63.3	4,456 tons
Income from sale of by-products	202.1	11,231 tons	82.3	9,991 tons
Total	619.6	—	533.3	—

*1 Reduction in CO_2 emissions (806 tons-CO_2) due to purchase of Green Power not reflected in above.
*2 For reduction in CO_2 amounts, the life of depreciable assets is used as the time for developing the investment effect.

Economic Effects (Domestic Group companies)

Category	2002 Economic effects (¥ million)	2002 Reduction volume	2003 Economic effects (¥ million)	2003 Reduction volume
Energy conservation	39.8	1,767 tons-CO_2	45.9	1,545 tons-CO_2
Resource conservation (water)	0.2	1,000 m^3	0.01	30 m^3
Resource conservation (raw materials)	3.7	136 tons	4.8	240 tons
Resource conservation (packaging)	5.4	—	5.3	—
Reduction in outsourced processing of by-products	6.8	290 tons	18.6	386 tons
Income from sale of by-products	44.8	762 tons	328.3	983 tons
Total	100.7	—	402.9	—

Notes: a. Costs are calculated by the difference from 2002, achieved by progressing with activities regarding energy conservation, resource conservation, and by-product reduction
b. Economic effects have been calculated independently
c. The following values are used to calculate economic effects:
- Energy conservation: Unit price of electrical power at each business site (ex. Nagoya Plant: ¥14.6/kWh, Chita Plant: ¥13.8/kWh, Komaki Plant: ¥17.2/kWh)
- Resource conservation (water): Unit price at each business site (ex. Nagoya Plant: ¥605/m^3)
- Resource conservation (raw materials): Unit price for each raw material
- By-product processing costs: Processing cost for each by-product (ex. ceramic material at Nagoya Plant: ¥8,500/ton)

Asahi Tec has been excluded from 2002 results for comparison with 2003.

Initiatives for the Future

Environmental accounting is an important indicator allowing NGK to better implement its Green Management as stated in our three-year management plan. Given this factor, in 2003, NGK strove to increase the accuracy of calculating both environmental cost and effects through means such as expanding the cost computation system linked to the accounting system, and by gaining a better understanding of the economic effect of environmental conservation activities carried out by each division.

From now on, in addition to continuing with calculating environmental accounting data by each business group, we will look into utilizing internal management in environmental conservation activities, and will work towards increasing the usefulness of environmental accounting. By 2005, we plan to expand the coverage of calculation to include overseas Group companies, and also, to plan to calculate cost and effect on a consolidated group basis.

Environmental Activities Related to Design and Development

In 1998, NGK introduced the full-scale application of its Design Review (DR) process, which is aimed at minimizing the environmental impact in product design and manufacturing technologies.
We also began research into Life Cycle Assessment (LCA) to reduce the environmental impact of both manufacturing processes and products. We are continuing to reduce this environmental impact while developing business in ecology-related fields.

Design Review

To produce environmentally conscious products by forestalling potential problems at the design stage, all departments are involved in DR activities at each stage of development.
Under DR, assessment of such environmental aspects as reduction of CO_2 emissions and by-product processing are conducted at all stages, from product planning up through the launch of production. In addition to such conventional evaluation items as functionality, cost, and delivery date, DR activities also cover optimization of functioning along with production processes and technology, as well as selection and minimization of materials.
DR is intended to achieve environmentally aware product design and production, as well as addressing emissions of pollutants into the air and water, reduction of by-products in production processes, and recycling.

DR Flow

DR Flow	Verification items	Environmental assessment items
Product planning: DR-I	•Development goals •Overall plan •Technical issues •Cost	•Identification of items affected by law and regulation
Product design: DR-II	•Design specifications •Production technology •Package design •Testing & evaluation planning	•Incorporation of basic specifications in environmental measures
Process design: DR-III	•Manufacturing process specifications •Purchasing specifications •Process FMEA* •Inspection process specifications	•Environmental measures in basic design and initial forecasts for environmental conservation level
Commencement of production: DR-IV	•Manufacturing conditions •Inspection conditions •Purchasing process	•Initial verification of environmental conservation level
Product planning: DR-V	•Mass-production testing •Worker training •QC process •Quality assurance	•Verification

Points to be evaluated

1. Optimum functionality
2. Selection of materials
3. Minimization of volume of materials used (conservation of resources and weight reduction)
4. Optimization of production processes and technology (conservation of energy)
5. Reduction of environmental impact, and reductions and recycling methods for by-products
6. Product lifespan
7. Safety

* FMEA: Failure Mode and Effect Analysis

LCA for HONEYCERAM® Ceramic Substrates for Catalytic Converters

HONEYCERAM® is a ceramic substrate used in catalytic converters for exhaust gas purification in gasoline-powered vehicles. Keeping the catalyst on the surface of the device and bringing it into direct contact with the exhaust gas means that HC, CO, NOx, and other harmful elements in the exhaust gas are converted into harmless substances. To accommodate increasingly stringent emissions regulations, NGK is further enhancing the performance of HONEYCERAM®, achieving an ultra-thin 0.05 mm wall.

NGK has released an aggregate total of some 500 million HONEYCERAM® around the world, including ultra-thin wall HONEYCERAM®. However, it is expected that demand for thin wall HONEYCERAM® will grow, as a result of increasingly stringent emissions regulations around the world.

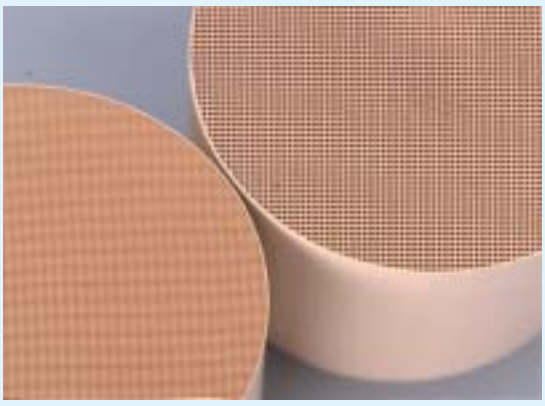
Consequently, we are taking a global perspective in pushing forward with efforts to reduce the impact on the environment, by both increasing productivity and reducing costs at our locations around the world. This has as its objective the use of our increased production of HONEYCERAM®, to counter the expected increase in CO_2 emissions during its production.

One example of this is our efforts towards reducing the impact on the environment through an LCA analysis of Company production processes. The effects of these improvements are shown in the diagram below.

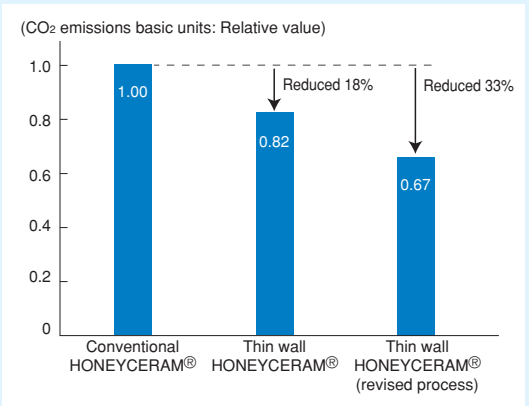
Ultra-thin wall and high-cell-density HONEYCERAM® is seeing an increase in demand, and when compared to conventional substrates, its strong point is its large surface area for the catalyst, hence significant reductions in size can be achieved. The graph compares the amount of CO_2 emitted when manufacturing HONEYCERAM® based upon its surface area, with its indirect ability to remove harmful elements in gas (per the same amount of CO_2 purification ability). As is shown in the graph, we saw an 18% decrease in the quantities of CO_2 emitted in the production of thin wall HONEYCERAM®, and our steady efforts toward improvements in the process have improved this figure to 33%. We are continuing to work towards improvements aimed at reducing the impact of this on the environment.

Measures such as these help to control CO_2 and other emissions from our production process. Furthermore, supplying HONEYCERAM® can dramatically reduce the amount of harmful HC, CO, and NOx gaseous emissions from gasoline engines, and contribute towards a reduced impact on the environment when viewed from an LCA perspective.

HONEYCERAM®



Changes in basic units* of CO_2 emissions in the manufacture of HONEYCERAM®



*Amounts of CO_2 emissions per geometric surface area (m^2)

Research into Ceramics Manufacturing Processes Having Low Environmental Impact

On April 1, 2003, NGK concluded an agreement for the research and development of ceramics manufacturing processes having low environmental impact with the National Institute of Advanced Industrial Science and Technology. This covers research and development into innovative technologies for reduction of environmental impact, including reducing the amount of CO_2 emitted in the manufacturing processes of ceramics. Its aim is both the advantage in production technologies, and the conservation of the global environment.

High-temperature firing is an indispensable process in ceramics manufacturing, and when compared to other industries, emits large quantities of CO_2. In addition, because volatile organic compounds are released within the degreasing process that removes organic binders from formed products, the development of technologies to reduce such environmental impact has become a top priority.

NGK has put forth a management policy of contributing to global environmental conservation and is continuing to develop manufacturing processes that have a low impact on the environment through business activities that apply the Company's proprietary ceramics technologies.

Environmental Activities Related to Production- CO_2 Emission Reduction

Cost reduction through controlling the increase in fuel and electric-power energy consumption associated with business expansion and development is a very important issue in business operations. Additionally, this is the age where our social responsibilities require of us even more stringent efforts toward preventing global warming, through further controlling CO_2 emissions.
NGK manufactures a range of ceramic products requiring a firing process, which is based on the combustion of carbon-rich fossil fuels such as petroleum and city gas, and as a result, emissions of CO_2 are unavoidable. In addition, there is an increase in commercial power used in both the development and manufacture of new products, also meaning an increase in CO_2 emissions associated with electricity. Therefore, in order to satisfy our social responsibilities of achieving cost reductions through constraints on energy consumption, and of prevention of global warming (reduction in CO_2 emissions), we are working in a range of areas that include the development of new technologies to reduce environmental impact, improvement of the production processes, and enhancement of management.
In particular, 70 to 80% of the CO_2 emitted during the production of ceramics comes from the firing process. Therefore, we are developing and improving combustion technologies to conserve energy, shifting to fuels that generate less CO_2, and recovering heat from waste gas produced in kiln use. Through these efforts, we have been improving the energy efficiency of firing kilns and other production facilities.
Management activities include supporting Company education and development relating to energy conservation, improvements in management in accordance with the Energy Management Standards, and the promotion of energy conservation from all angles. Furthermore, to prevent global warming, we are also making further efforts to reduce CO_2 emissions in our construction of new medium-term targets for 2006 and long-term targets for 2010.

Primary Targets (2005)

1) Keep basic unit (total amount/sales) within 1990 levels.
2) Reduce basic unit (total amount/production) (index)* by 10% in existing main products such as insulators and HONEYCERAM®.

Secondary Targets (2004-2010)

Medium-term targets **Change in 2006 over 2003 0%**
Long-term targets **Change in 2010 over 1990 7% decrease**

* Basic unit (total amount/production)(index): An index based on the 1990 production amount as 100.

Long-term Schedule for CO_2 Emission Reduction

Item		2001	2002	2003	2004	2005	2006
Overall company targets		Primary targets					0% increase over 2003
			Secondary targets (medium-term targets)				
Improvements in technologies and facilities	Introduction of faster firing technology in tunnel kilns						
	Process improvements (reducing of firing time)						
	High-efficiency production system						
	Kiln energy conservation (regenerative combustion)						
	Heat recovery (waste heat boilers)						
	Clean room energy conservation						
	Office building energy conservation						
Management improvements	Improvements in operational methods and energy management						
Introduction of environmental assessment methods (LCA)							
Purchase of new types of energy (Green Power)							

Note: Due to business expansion, CO_2 emissions have been on the increase, and therefore in March 2004 the Company established new total emissions goals in order to achieve both the prevention of global warming and cost reductions.
We have established medium-term targets up to 2006 and long-term targets up to 2010 in order to strengthen our energy conservation activities.

Changes in CO_2 Emissions

Non-consolidated

Total CO_2 emissions in 2003 reached about 166,000 tons-CO_2, representing a 2.0% rise over 2002, and 17% higher than the results from 1990, which are the reduction objectives. The basic unit (total amount/sales) was 85.8 tons-CO_2/¥100 million, an increase of 3.3 tons-CO_2/¥100 million over 2002, and 25% above 1990 levels. These increases are caused by a rise in consumption of electricity and liquid natural gas (LNG) owing to the increased production of HONEYCERAM®, diesel particulate filters, and NAS® batteries, while individual CO_2 emissions reduction plans are already in place.

To strengthen management of CO_2, future CO_2 reduction targets have changed from the previous basic unit (total amounts/sales) to emissions quantities. In particular, we are implementing more thorough planning, measures, and follow-ups, and are introducing a management method in which increase and decrease of emissions are managed separately.

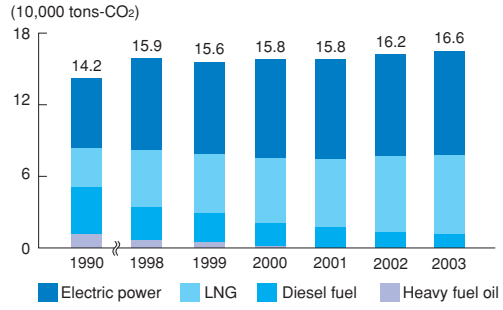
In order to enhance the management structure, we have reorganized the CO_2 Countermeasures Commission. Under the new commission, plant managers serve as chiefs at Regional Sub-Commissions, and the major departments that emit CO_2 participate in the commission as members.

Domestic and Overseas Group Companies

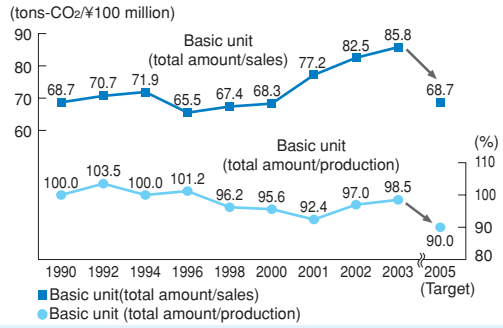
CO_2 emissions by domestic Group companies were 64,000 tons-CO_2, a level similar to 2002. A breakdown of CO_2 emissions by fuel shows the most significant sources were electricity and liquid petroluem gas (LPG).

Emissions by overseas Group companies were 160,000 tons-CO_2, resulting in a 10,000 ton-CO_2 increase over 2002 due to the expansion of data coverage from 13 companies to 16. A breakdown by fuel type shows the majority of emissions were from electricity and LNG, both of which offer relatively low CO_2 emissions.

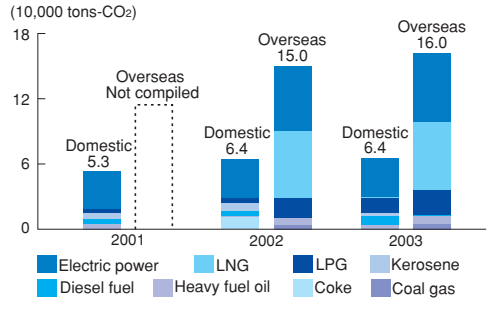
Changes in CO_2 Emissions (Non-consolidated)



Changes in Basic Unit (Non-consolidated)



Changes in CO_2 Emissions (Domestic and overseas Group companies)



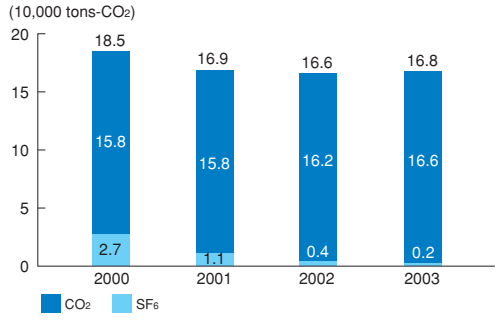
Note: The CO_2 conversion factor for years prior to 2003 has been changed.
Asahi Tec has been excluded from 2002 results for comparison with 2003.

Changes in Greenhouse Gas Emissions (Non-consolidated)

Of the six designated greenhouse gases*, we began calculating greenhouse gases in 2001 and have continued with calculating atmospheric emissions of CO_2, CH_4, and N_2O from combustion, and of SF_6 insulating gas. CO_2 and SF_6 accounted for nearly 100% of total emissions of greenhouse gases. In 2003, SF_6 emissions were reduced by a further 50% over 2002 levels.

* Greenhouse gases: gases that trap thermal radiation reflected from the surface of the Earth, thus resulting in a "greenhouse effect" wherein the overall temperature of the Earth increases. Carbon dioxide (CO_2), methane (CH_4), dinitrogen monoxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are designated as greenhouse gases. The greenhouse effect of SF_6 is approximately 24,000 times as strong as that of CO_2.

Amount of Greenhouse Gas Emissions

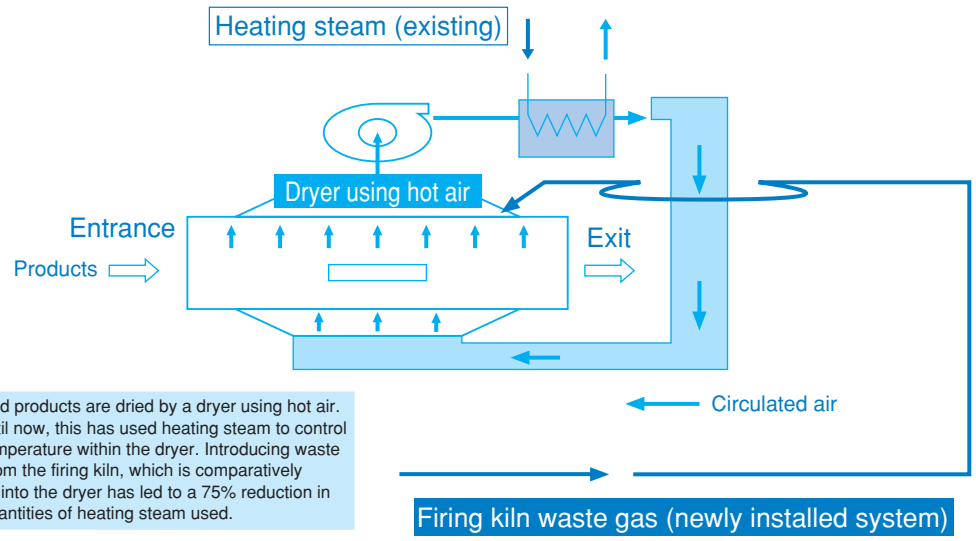


Effective Use of Firing Kiln Waste Heat

Effective Use of Firing Kiln Waste Heat

The Nagoya HONEYCERAM® plant utilizes a dryer with hot air for drying formed products. For efficient energy usage during the production process as a whole, the plant began application of waste gas from tunnel kilns for the dryer using hot air in 2003, and as a result achieved a 75% reduction in the quantity of heating steam used in the dryer. This resulted in a reduction in CO_2 usage, down to 304 tons-CO_2 per year.

Effective Usage of Firing Kiln Waste Heat



Formed products are dried by a dryer using hot air. Up until now, this has used heating steam to control the temperature within the dryer. Introducing waste gas from the firing kiln, which is comparatively clean, into the dryer has led to a 75% reduction in the quantities of heating steam used.

Reduction in CO_2 through Enhanced Management

Introduction of the Energy Monitoring System

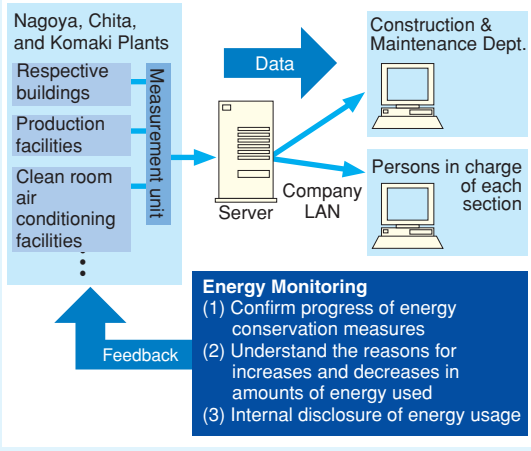
Efficient use of energy is one of the most important efforts for reducting the environmental impact caused by wasted energy. Accordingly, we have implemented the Energy Monitoring System in order to achieve more accurate energy management. A total of eight plants, including the Nagoya HONEYCERAM® Plant, the Komaki NAS® Battery Plant, and the Chita Plant for ceramic products for semiconductor manufacturing equipment, all of which have high energy usage, have introduced the Energy Monitoring System.

An understanding of the standard energy amounts in main processes allows appropriate energy management and energy conservation through energy reduction when the processes are not in use. In addition, the number of processes such as meter checking is reduced by overall system operation that achieves efficient energy management.

Optimization of Clean Room Electricity Usage

Up until now, clean rooms in R&D buildings have had in place full air conditioning for their use. However, an Energy Monitoring System has been introduced which enables a changeover to low-impact mode during unattended operation, including operation at night. As a result, energy used for air conditioning has been reduced, while still maintaining optimal operational environments. We have achieved energy reductions equivalent to 380 tons-CO_2 per year.

Energy Monitoring System



Other Activities

Compliance with CO_2 Regulations of Aichi Prefectural and Nagoya City Governments

Newly enforced regulations in Aichi Prefecture and Nagoya City include efforts to control CO_2 emissions in order to help prevent global warming. Compliance with these regulations is a responsibility of companies carrying out operations in these regions.
As of 2004, NGK has submitted plans for global warming countermeasures in accordance with prefectural and city regulations, and these plans are being publicized and firmly implemented. Additionally, the Company will work toward management of total quantities, complying with these regulations to achieve further decreases.

Full Energy Checks at Komaki and Chita Plants

NGK's three business sites have been listed as Type 1 designated energy-management factories in accordance with the Law Concerning the Rational Use of Energy. In accordance with this law, on-site investigations were carried out at the Chita Plant in October 2003, and at the Komaki Plant in January 2004. We succeeded in attaining a score of more than 80 points as a result of our efforts on establishment of a management system based on energy management standards. Additionally, we will make use of the points we received during this check for prompt responses in future management.

Full energy check

Reduction in Impact through Generation with Energy Use Leveling

A 500-kW NAS® battery was installed at the Komaki Plant to make use of nighttime electric power, and this is contributing toward a reduction in the environmental impact caused by increased demand for daytime electricity generation. We have expanded our activities toward energy use leveling through such measures as installation of NAS® batteries and introduction of "Eco-Ice." We will continue to spread the introduction of NAS® batteries.

NAS® battery (Nagoya Plant)

Green Power Purchasing

To limit rises in CO_2 emissions that accompany increases in production, NGK turned to wind power, a renewable energy that has minimal CO_2 emissions. In September 2001 NGK signed a contract with the Japan Natural Energy Co., Ltd. for a Green Power Certification System,* and began purchasing 2 GWh of wind power from January 2002. The basic unit of CO_2 emissions from wind power is less than 10% that of power from fossil fuels. The introduction of 2 GWh of wind power will prevent the release of 806 tons-CO_2 annually.

The Noshiro Wind Power Station

*The Green Power Certification system gives a concrete form of environmental added value such as energy conservation (reduction of fossil-fuel use), and reductions in CO_2 emissions obtained by using power generated by natural energy sources. It can be used by companies and other organizations as an independent energy-conservation or environmental measure.

Initiatives for the Future

NGK is seeing an increase in energy consumption (CO_2 emissions) attributable to business expansion and development. Against this background, the Company has established new medium-term targets (0% increase in 2006 over 2003) and long-term targets (7% decrease in 2010 over 1990) aimed at simultaneous pursuit of cost reduction and prevention of global warming.
NGK is continuing with energy savings in production facilities and its air conditioning and lighting equipment. Additionally, NGK is promoting more comprehensive energy management through compliance with the Energy Management Standards outlined by the Law Concerning Rational Use of Energy. Heat energy given off by ceramic firing kilns is a particular issue for NGK, and therefore in addition to existing heat recovery and usage systems, we are studying more sophisticated technology for efficient recovery and effective use. Technologies and know-how that are then proven to be effective will be deployed at both domestic and overseas Group companies, thus contributing toward the control and reduction of greenhouse gas emissions from a global perspective.

Production-related Environmental Activities – Recycling of Production By-products

In recent years, various laws related to the Basic Law for Establishing a Recycling-based Society (established in 2000) have been enacted, giving a legal infrastructure to assist in activities to form a recycling-based society. To this end, March 2003 saw the birth of the Basic Law for Establishing a Recycling-based Society to promote comprehensive and systematic policies, and this has clarified the form of the recycling-based society toward which Japan is moving.
NGK is utilizing its resources in its business activities more effectively than ever to adapt to social change. In 2002, we repositioned "wastes" as "by-products" (recyclable resources), and have been further expanding efforts in recycling by-products while working to reduce generation. In particular, as a result of our investigation and cultivation of our external cooperating companies for recycling, we have achieved significant reductions in the amount for outsourced processing.
In the future, we will further enhance our efforts to reduce by-products and promote recycling at domestic and overseas Group companies, and will continue with our aim of achieving zero emissions globally.

Recycling targets for by-products

2003 target: Reduce amount requiring outsourced processing by 40% compared to 2001 levels (3,300 tons)
2005 target: Zero emissions*

* Zero emissions:
The reduction of the volume of by-products for final disposal into landfills to levels of less than 1,000 tons per year. This will be achieved through the reuse of by-products as raw materials or fuels and the reduction of ordinary waste through improvements in production and manufacturing processes.

Long-term Schedule for By-product Recycling

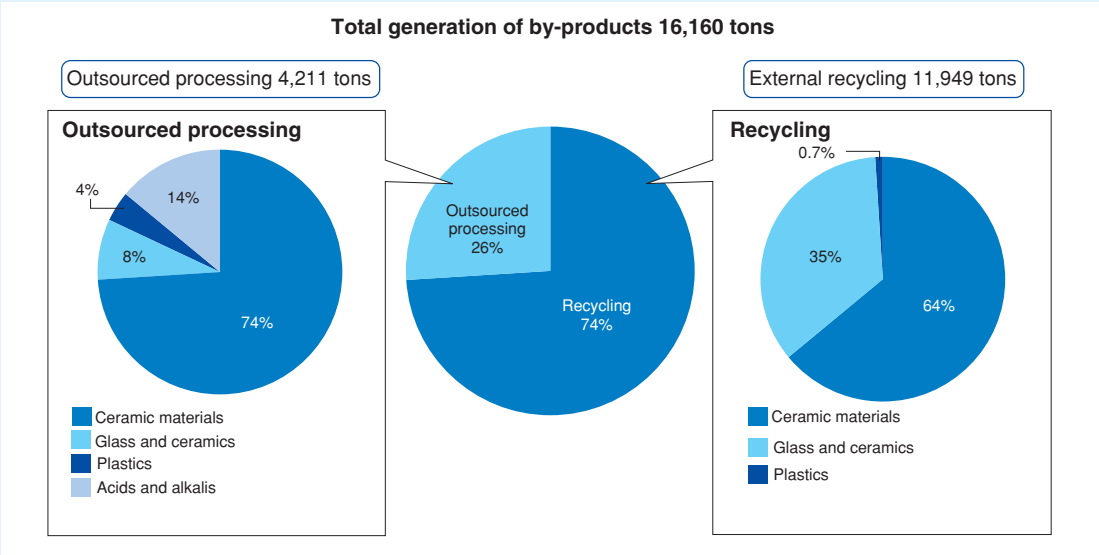
Item		2001	2002	2003	2004	2005
Effective by-product utilization	Reduction targets		40% from 2001 levels (3,300 tons)			Zero emissions
	Consideration and implementation of policies by division to reduce inherent inter-Group waste					
	Consideration by technical subcommittees when technical issues arise					
Production technology	Environmentally conscious production technology designed, environmental assessment					
	Development of essential technologies					

By-product Generation (Non-consolidated)

In 2003, the NGK production process generated a total of 16,160 tons of by-products, a level similar to 2002. As for amounts of outsourced processing, we were unable to achieve the 2003 target of 3,300 tons or less, due to stepped up production for new products such as diesel particulate filters and NAS® batteries. However, this was still a 1,336-ton reduction from 2002's 5,547 tons, and we are thus making steady advances toward achieving zero emissions in 2005.

The significant 1,336-ton reduction in outsourced processing was due to changing the metal acid washing system to a closed system and strengthening efforts for external recycling of ceramic material and glass and ceramics. Concurrent with this, the amount of by-products recycled was 11,949 tons for 2003, an increase of 1,063 tons over 2002's level of 10,886 tons, and the recycling rate rose from 66% in 2002 to 74% in 2003.

By-product Recycling and Outsourced Processing (Non-consolidated)



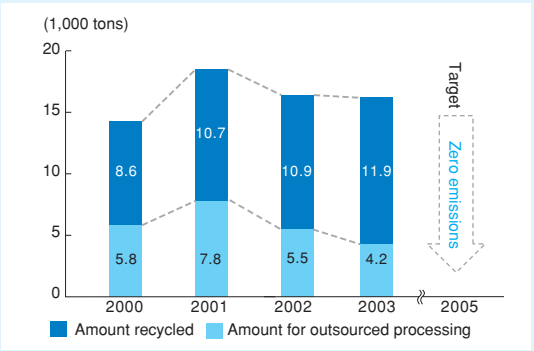
By-product Recycling (Non-consolidated)

Many of the by-products from the NGK production processes are ceramic materials as well as glass and ceramics, which can be recycled effectively. We are working to reuse these resources in-house, and at the same time, these can be reused outside the Company as raw materials for porous ceramics, bricks, and refractories.

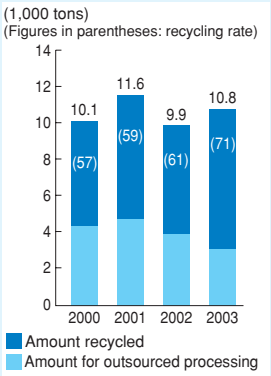
The year 2003 saw us make great progress in our move toward recycling of ceramic material by-products. Although the total amount generated increased 850 tons over the 2002 level, quantities recycled also increased by 1,665 tons; the recycling rate increased by 10%, from 61% in 2002 to 71%, and the amount for outsourced processing decreased by 815 tons over 2002.

Additionally, we are making great progress in recycling glass and ceramics, with our recycling rate increasing by 26% over the last three years, to surpass 90% in 2003. The amount of plastics generated has increased slightly and the amount recycled has decreased slightly, resulting in a drop in the recycling rate.

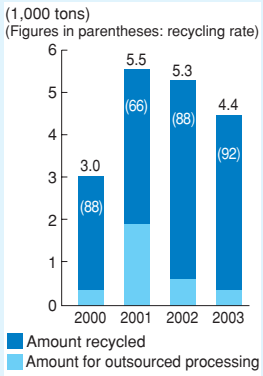
Trends and Targets in By-product Generation (Non-consolidated)



Changes in Recycling of Ceramic Materials



Trends in Recycling of Glass and Ceramics



Generation and Recycling of By-products (Non-consolidated)

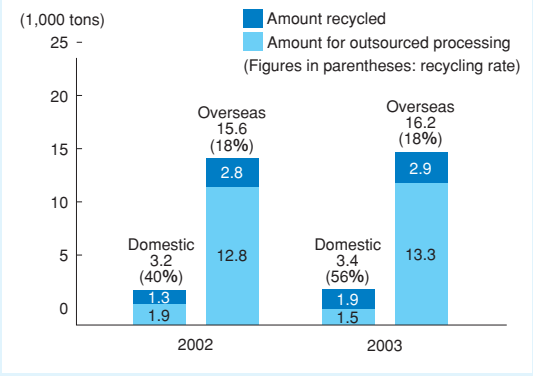
(tons)

By-product	2002				2003			
	Total generation	Recycled	(Recycling rate)	Outsourced processing	Total generation	Recycled	(Recycling rate)	Outsourced processing
Ceramic materials	9,882	5,985	(61%)	3,897	10,732	7,650	(71%)	3,082
Plastics	233	88	(38%)	145	256	84	(33%)	173
Glass and ceramics	5,281	4,655	(88%)	626	4,446	4,090	(92%)	356
Slag	42	42	(100%)	0	45	45	(100%)	0
Oils	145	116	(80%)	29	101	82	(81%)	20
Acids and alkalis	850	0	(0%)	850	580	1	(0%)	580
Total	16,433	10,886	(66%)	5,547	16,160	11,949	(74%)	4,211

By-product Generation and Recycling (Domestic and Overseas Group Companies)

For 2003, total amounts of by-products generated were 3,365 tons for the domestic Group companies and 16,000 tons for overseas Group companies, and both of these figures are largely unchanged. Recycling continued to expand in domestic Group companies, reaching 56%, with recycling rates surpassing 50%. However, not enough progress was made as regards recycling at overseas Group companies, with recycling rates at 18%. This will be one of the important issues in the future.
A breakdown of by-product generation shows that glass and ceramics account for the largest portion of the domestic Group companies output, followed by ceramic materials, then plastics. For overseas Group companies, glass and ceramics accounted for the largest portion, followed by ceramic materials.

By-product Generation (Domestic and overseas Group companies)



Note: Asahi Tec has been excluded from 2002 results for comparison with 2003.

Generation and Recycling of By-products (Domestic Group companies)

(tons)

By-product	2002				2003			
	Total generation	Recycled	(Recycling rate)	Outsourced processing	Total generation	Recycled	(Recycling rate)	Outsourced processing
Ceramic materials	941	22	(2%)	919	903	464	(51%)	439
Plastics	341	67	(20%)	273	406	111	(27%)	296
Glass and ceramics	1,385	859	(62%)	525	1,658	1,026	(62%)	632
Slag	28	28	(100%)	0	121	121	(100%)	0
Oils	124	92	(74%)	32	156	115	(74%)	41
Acids and alkalis	366	195	(53%)	171	104	31	(29%)	74
Other	5	5	(100%)	0	16	7	(47%)	8
Total	3,190	1,269	(40%)	1,921	3,365	1,875	(56%)	1,490

Note: Asahi Tec has been excluded from 2002 results for comparison with 2003.

Generation and Recycling of By-products (Overseas Group companies)

(tons)

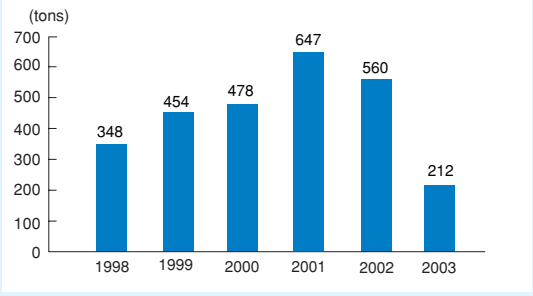
By-product	2002				2003			
	Total generation	Recycled	(Recycling rate)	Outsourced processing	Total generation	Recycled	(Recycling rate)	Outsourced processing
Ceramic materials	4,754	667	(14%)	4,088	4,126	69	(2%)	4,057
Plastics	349	13	(4%)	336	389	36	(9%)	353
Glass and ceramics	10,006	2,019	(20%)	7,988	10,851	2,710	(25%)	8,141
Slag	110	10	(9%)	100	235	20	(9%)	215
Oils	119	61	(51%)	58	123	77	(63%)	46
Acids and alkalis	273	0	(0%)	273	436	0	(0%)	436
Other	12	7	(58%)	5	17	6	(35%)	11
Total	15,623	2,777	(18%)	12,848	16,177	2,918	(18%)	13,259

Internal Resource Recovery Activities

Process Improvements in Metal Plants

The Chita Metal Plant has implemented equipment for the recirculation and concentration of copper-containing acid washing fluid. Additionally, switching from acid washing fluid to chemical polishing fluid means that the generation of both nitrogen emissions and acid waste after processing can be reduced. Concentrating this acid washing fluid makes it possible to reclaim the copper contained in it, which was impossible before. In addition, the recirculation of this acid washing fluid has enabled vast reductions in the amounts of acid used.

Trends in Processing Waste Acids (Chita Plant)



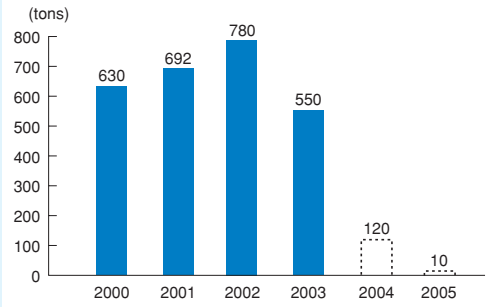
In 2003, NGK achieved a 350 ton reduction in the amount of acid used, with a corresponding ¥18 million decrease in processing costs for by-products.

Copper sulfate recovery equipment (Chita Plant)

■Recycling Cement Ceramics

At the Komaki Insulator Plant, we have started the recycling of cement ceramic materials, which up until November 2003 had been disposed of in landfills, and this has led to a significant reduction in outsourced processing.
Whereas 2002 had 780 tons of outsourced processing, in 2003 this figure had dropped to 550 tons, and 2004 is expected to see this drop to 120 tons.
Recycling of cement ceramic materials is carried out in conjunction with cooperating companies, and requires integrated management, from collection, right through transportation and processing. NGK has achieved effective recycling through inspections of constituents in by-products, enhancement of wastewater processing facilities, securement of appropriate storage locations, and development of carts for transportation.

Changes in Generation of Cement Ceramic Materials (Komaki Plant)



Removal of excess cement* and other materials → Cement ceramic materials → Storage and moisture removal of cement ceramic materials → Reuse at cooperating companies

Coment: Used to bond insulator ceramic with metal component.

Initiatives for the Future

To achieve our goal of zero emissions by 2005, we are continuing our efforts focusing on the control of by-product generation and on increasing the recycling rate. We will continue to follow up on our 2004 and 2005 plans, and in addition to responding to any new issues in a timely manner, once we have achieved our 2005 goals of zero emissions, we plan to work toward limiting the overall amounts of by-products generated. We will draw up a detailed schedule to meet these goals during 2004.

Production-related Environmental Activities – Management of Chemical Substances

Two years have passed since the enactment of the Law Regarding the Pollutant Release and Transfer Register (PRTR Law) in January 2001, which governs the appropriate management of chemical substances, and this is now established as an integral part of our business activities.
NGK not only observes applicable laws and regulations such as the PRTR Law, but is continuing its measures to minimize the environmental impact derived from chemical substances. These measures include development of management systems for enhanced handling of chemical substances, thorough control of emissions into the environment, the development and application of technologies for stabilization and detoxification, and full-scale investigation and employment of alternatives to harmful chemical substances.
A visible result of implementing these measures is that targets that we set for the control of PRTR-listed solvent emissions into the atmosphere, and that were part of our five year plan implemented at the same time as the PRTR law, were achieved two years ahead of schedule.
We are expanding our activities by using the accomplishments and management know-how gained at our three plants in the efforts of our domestic Group companies, and in requesting that both suppliers from whom we purchase materials, and our cooperating companies implement improved management of chemical substances.

Reduction Target for Chemical Substances

2005 target: Reduce atmospheric solvent emissions to below 20% compared to 2000 levels

Target Achieved in 2003

Long-term Schedule for Management of Chemical Substances

Item		2000	2001	2002	2003	2004	2005
Construction of a management framework	Building of a unified chemical substance management system						
	Chemical Substance Safety Committee						
Compliance with PRTR Law	Reduction target		Target Achieved in 2003 / Reduce atmospheric solvent emissions to below 20% of 2000 levels in 2005				
	Careful consideration of quantity used and promotion of recycling						
	Consideration of stabilization and detoxification methods						
Compliance with new regulations	Law Concerning Special Measures Against Dioxins and Polychlorinated-biphenyl (or PCB) Waste						
	EU regulations						
	Regulations in Aichi Prefecture and Nagoya City						
	Risk communication						

Chemical Substances Management System

To properly understand and minimize the risks inherent in management of chemical substances, the Chemical Substances Management System entered full-scale operation in October 2000, and currently approximately 6,500 chemicals are registered and carefully managed under the system. The Chemical Substances Management System has been integrated with the on-line purchasing system, and all raw materials, fuels, paints, and chemicals used by the Company are handled on identical systems. When the quantities of PRTR-listed substances purchased and consumed are input, the amounts of such chemical substances transferred off-site and emitted are automatically calculated.

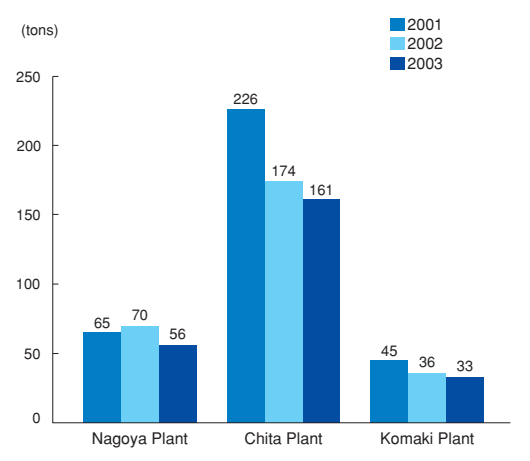
Moreover, we added a Material Safety Data Sheet (MSDS) search function and implemented reviews of regulations and component information regarding registered products to construct a database of chemical-substance information through the Company network. Sharing of chemical-substance information throughout the Company means a reduced risk in handling.

Implementation of Chemical Substances Management System (Nagoya Plant)

Handling of PRTR-listed Substances (Non-consolidated)

The PRTR Law specifies 354 Class 1 Designated chemical substances. NGK handled 71 of these substances in its Company-wide operations in 2003. The total amount of these substances handled was 250 tons. NGK notified the government as regards 19 substances, including raw materials for metallic products, glaze for insulators, and others. The total amount handled dropped 30 tons (11%) from the figure of 280 tons in 2002, as a result of appropriate purchasing and management in line with increased management consciousness. However, because of increases in quantities handled, the end of interim legal measures, and changes in production, the Company handled in total 13 of these substances, and an additional five substances for which notification was made to the government.
Broken down by plant, the Nagoya Plant handled approximately 56 tons of 55 substances, the Chita Plant approximately 161 tons of 51 substances, and the Komaki Plant approximately 33 tons of 28 substances. Each of our plants have seen a definite decrease over the last three years, and we will continue to manage these effectively.

Amounts of PRTR-listed Substances (Non-consolidated)



Amounts of PRTR-listed Substances Handled, Released, and Transferred (Non-consolidated)

(tons)

Business site	Substance	2003						
		Amount handled	Amount released				Amount transferred	
			Atmosphere	Water	Soil	Landfill	Sewage	Outside
Nagoya Plant	Toluene	15.96	0.87	0.00	0.00	0.00	0.00	0.05
	Formaldehyde	10.42	0.21	0.00	0.00	0.00	0.00	0.00
	Xylene	8.88	0.07	0.00	0.00	0.00	0.00	1.06
	Ethylene glycol	5.84	0.00	0.00	0.00	0.00	0.01	5.71
	Acetaldehyde	4.83	0.15	0.00	0.00	0.00	0.00	0.00
	Hydrogen fluoride and its water-soluble salts	4.32	3.26	0.00	0.00	0.00	0.01	0.05
	Nickel compounds	1.66	0.00	0.00	0.00	0.00	0.05	1.28
	Ethyl benzene	1.64	0.01	0.00	0.00	0.00	0.00	0.00
	Benzene	0.64	0.01	0.00	0.00	0.00	0.00	0.00
	Total	56.33 (55 substances)	4.68	0.00	0.00	0.00	0.07	9.41
Chita Plant	Beryllium and its compounds	102.55	0.00	0.00	0.00	0.23	0.00	0.14
	Nickel	17.24	0.00	0.00	0.00	0.81	0.00	0.00
	Cobalt and its compounds	8.88	0.00	0.00	0.00	0.46	0.00	0.04
	Manganese and its compounds	8.80	0.00	0.08	0.00	0.00	0.00	0.00
	Tri-n-butyl phosphate	8.08	0.00	0.00	0.00	0.00	0.00	0.00
	Chrome and trivalent chrome compounds	6.07	0.00	0.00	0.00	0.00	0.00	0.00
	Copper water-soluble salt	5.35	0.00	0.01	0.00	0.00	0.00	5.34
	Hydrogen fluoride and its water-soluble salts	1.20	1.20	0.00	0.00	0.00	0.00	0.00
	Dioxins	—	0.0393 mg/yr	0	0	0	0	0.0255 mg/yr
	Total	161.01 (51 substances)	2.04	0.10	0.00	1.50	0.00	6.75
Komaki Plant	Bisphenol-A epoxy resin (polycondensation polymer of 4,4'-isopropylidenediphenol and 1-chloro-2,3-epoxypropane)	8.69	0.00	0.00	0.00	0.00	0.00	0.09
	Manganese and its compounds	8.25	0.00	0.04	0.00	0.00	0.00	0.02
	Chrome and trivalent chrome compounds	6.28	0.00	0.00	0.00	0.00	0.00	0.05
	Ethylene glycol	3.48	0.01	0.00	0.00	0.00	0.00	0.00
	Antimony and its compounds	2.34	0.00	0.01	0.00	0.00	0.00	0.24
	Total	32.97 (28 substances)	1.03	0.07	0.00	0.00	0.00	1.02
	Grand total	250.30 (71 substances)	7.75	0.17	0.00	1.50	0.07	17.18

Note: Dioxins are subject to be notified as they are generated at special facilities.

Handling of PRTR-listed Substances (Domestic Group companies)

From 2002, the range of PRTR-listed substance data was expanded to cover domestic Group companies.
The total amount of these substances handled by domestic Group companies in 2003 was 134 tons. Eight companies provided notification to the government for a total of ten PRTR-listed substances.

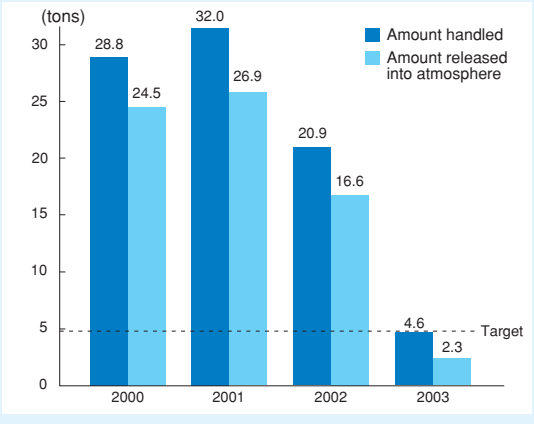
Amounts of PRTR-listed Substances Handled, Released, and Transferred (Domestic Group companies) (tons)

	Substance	2003						
		Amount handled	Amount released				Amount transferred	
			Atmosphere	Water	Soil	Landfill	Sewerage	Outside
Domestic Group Companies	Toluene	51.36	3.07	0.00	0.00	0.00	0.00	13.15
	Xylene	27.53	1.76	0.00	0.00	0.00	0.00	5.32
	Bis (2-ethylhexyl) phthalate	3.11	0.10	0.00	0.00	0.00	0.00	0.09
	Chrome and trivalent chrome compounds	1.39	0.00	0.00	0.00	0.00	0.00	0.02
	Lead and its compounds	23.22	0.00	0.00	0.00	0.00	0.00	2.67
	Bisphenol-A type epoxy resin	8.88	0.00	0.00	0.00	0.00	0.00	0.64
	Vanadium Divanadium pentoxide	4.60	0.00	0.00	0.00	0.00	0.00	0.00
	Silver and its water-soluble compounds	2.83	0.00	0.00	0.00	0.00	0.00	0.00
	Bisphenol-A	2.03	0.00	0.00	0.00	0.00	0.00	0.28
	Antimony and its compounds	1.70	0.00	0.00	0.00	0.00	0.00	0.01
	Tetrahydromethylphthalic anhydride	1.65	0.00	0.00	0.00	0.00	0.00	0.01
	Manganese and its compounds	1.22	0.00	0.00	0.00	0.00	0.00	0.17
	Boron and its compounds	1.17	0.00	0.00	0.00	0.00	0.00	0.00
	Benzene	0.66	0.00	0.00	0.00	0.00	0.00	0.00
	Total	133.87	6.03	0.00	0.00	0.00	0.00	22.56

Response to PRTR-listed Substances

Of the PRTR-listed substances released into the environment in 2000, 97% were organic solvents,* and most were released into the atmosphere. NGK is aiming to reduce the amount of solvent released into the atmosphere to less than 20% of 2000 levels by 2005, and has investigated the use of alternative substances and improved facilities, with the result that 2003 atmospheric emissions were 9% of 2000 levels, reaching this goal two years ahead of schedule. Additionally, the amount transferred dropped drastically as a result of improvements in the acid washing process in metal plants.

Changes in Amount of Solvents Handled and Released into the Atmosphere

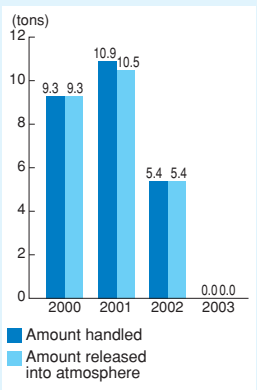


* Organic solvents:
Substances including toluene, xylene, and dichloromethane etc.

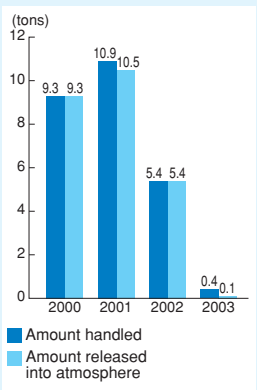
■Abolition of Solvents Used in Insulator Assembly

A mixture of dichloromethane and toluene had been used at the Komaki Plant as a solvent for insulator assembly, but has been replaced by a mixture of methylcyclohexane and ethylcyclohexane, neither of which are PRTR-listed substances. As a result, a mixture of dichloromethane and toluene which was used in quantities of 21 tons per year was totally eliminated in July 2002. No dichloromethane was handled in 2003. Furthermore, because other processes still use a small amount of toluene, it was not possible to totally eliminate its usage, however emissions quantities have dropped 98% from 2002.

Changes in Dichloromethane Emissions (Komaki Plant)



Changes in Toluene Emissions (Komaki Plant)



Measures to Prevent Soil Contamination

The Soil Contamination Countermeasures Law was enforced in February 2003, and NGK realized that environmental assessment of the soil and underground water was required. Chemical substances used in the past were researched, and surveys of soil and underground water were begun. In the event surveys do reveal pollution, this is quickly disclosed, and appropriate action shall be taken. Additionally, NGK is strengthening its preventative measures at the facility design stage for sump pits and the like.
Similar measures are also being recommended at domestic Group companies, and because a 2003 survey of soil and underground water at plants showed pollutants in excess of environmental standards at NGK Printer Ceramics Co., Ltd. (Head Office: Komaki, Aichi), one of the NGK Group companies manufacturing electronic products, a report was sent to both Aichi Prefecture and Komaki City, and necessary anti-pollution measures were undertaken. Investigations have not shown any pollution to wells in the area as yet, however, top priority has been given to the prevention of any discharge of pollutants from the premises, and furthermore, soil and groundwater decontamination have been carried out as a more permanent measure.

Chemical Substance Management

Moving to Self-management of Chemical Substances in the R&D Section

When new chemical substances are being used, NGK uses a new chemical substance management system that covers applications, investigations, registration, and usage quantities for new substances in order to avoid risks from chemical substances, and to understand the quantities of PRTR-listed substances used. However, the R&D Section uses many types of chemical substances in tiny amount which are applicable to various regulations, and some of these substances are very dangerous and harmful even in small quantities. Therefore, it is important for staff members using these to be fully aware of their chemical attributes, and able to handle and dispose of these chemicals in an appropriate and safe manner. Because of this, the R&D Section has started an independent Safety Committee in addition to the existing company-wide Chemical Substances Safety Committee.
By having managers in the R&D Section survey chemical substances based on company-wide, uniform screening criteria, it is aimed that this committee can implement more accurate management of safety, and improve awareness of chemical substance management. Furthermore, implementing applications using electronic files will speed up the application process and facilitate the import into the database, and thus improve convenience.

Enhanced Liquid Leakage Prevention Measures

Measures such as performance increases through the installation and multi-level use of detoxification equipment, recovery of effluent, and recycling have been implemented in chemical substances handling facilities in each section, in order to minimize the risk from chemical substances leaking into the environment.
Additionally, as well as clarifying systems and responses in a state of emergency, we are promoting reviews of the construction of facilities that may experience leaks into the environment during earthquakes and other disasters.

Initiatives for the Future

The PRTR Law has been in place for three years, and amendments to its regulations have necessitated even more advanced chemical management.
NGK is ensuring strict compliance with these newly amended regulations in order to ensure global environmental conservation. Furthermore, in order to improve management levels, we are promoting continuous reductions in the amount of PRTR-listed substances that are handled and emitted, thorough leakage prevention from those facilities and improvement of management manuals. Additionally, we will ensure even more detailed chemical management through implementing reviews of measures taken in response to disasters such as earthquakes.
Furthermore, the range of chemical regulations have been expanded and strengthened. Examples include regulations in Europe – the Directive of the European Parliament and the Council on end-of-life vehicles (ELV), which were implemented in July 2003 – and regulations that prohibit chemical substances in the electronics field (including RoHS and WEEE) that will come into effect in 2006. We are studying new chemical management standards for chemicals used in products, raw materials, and by-products from production, in order that we can adapt to these types of global regulations.

Environmental Activities Related to Procurement and Logistics – Green Purchasing

In order to reduce the impact on the environment, NGK is making positive efforts not only within our own area, but also in businesses upstream. NGK has a Green Purchasing Policy, which covers all purchased items and services, from raw materials and parts, to services and manufacturing facilities. Through preferential purchasing in line with our Green Purchasing Policy, NGK is contributing in a meaningful way to reducing the environmental impact upon society.

The Green Purchasing Policy

1. NGK conducts Green Purchasing of all materials, components, manufacturing equipment, office supplies, and services.
2. After considering quality, price, and delivery periods, NGK gives preference to companies that provide products and services in an environmentally friendly manner.

Long-term Schedule for Green Purchasing

	Item			2001	2002	2003	2004	2005
Purchased Items	Greening of office supplies	Introduction and expansion of *"Benrinet"*		100 items	Approx. 250 items	Development for indirect material application		
					Approx. 1,570 items handled by *"Benrinet"*			
	Greening of materials for production	Purchase of Green Power (Signed Sep. 2001, started Jan. 2002, 15-year contract)						
		Energy conservation measures	Office automation equipment, air conditioners, lighting, structural insulation standards, etc.					
			High-efficiency motors, transformers, etc.					
			Conversion to fiber kiln, inverter control, etc.					
	Reduction and greening of purchased packaging material	Begin with trial lines to establish procedure and technique						
		Enactment of Green Packaging Guidelines for operating divisions and suppliers			Enactment	Implementation		
Green Suppliers	Questionnaire on implementation by suppliers				200 companies			
	On-site inspections of suppliers' environmental activities							
	Guideline review and suppliers guidance							
	Explanatory meetings for suppliers							
Internal Education	Increase employee awareness with video news and Company magazine							
	Explanatory meetings for *"Benrinet"*							

Enactment of Green Packaging Guidelines

In March 2003, the Company enacted guidelines specifying such matters as the adoption whenever possible of returnable containers and the use of packaging materials bearing the Eco-Mark, out of consideration to the environmental impact of the packaging of purchased articles, and in May this year we requested 900 of our major suppliers to adhere to these guidelines as well. This year, we are also making efforts in order that our suppliers cooperate to further reduce quantities of packaging by-products generated at the time of delivery.

Reduction of Paper Usage through Review of Purchasing Processes

March 2004 saw the completion of the computerization of our purchasing system, and 80% of vouchers and forms issued both internally and externally have been switched over to an electronic system. We are now looking at reviews of office operations in order to reduce paper usage.

Approaches to Suppliers

In all operations, NGK gives priority to suppliers that place serious consideration upon environmental conservation. We explain our policies to our suppliers, and make sure these are understood. Additionally, we exchange opinions in order to request their cooperation in environmental conservation activities.
Furthermore, we are continuing with our reviews of Green Purchasing Guidelines, and are investigating the establishment of Green Purchasing Guidelines for our suppliers.

Environmental Activities Related to Procurement and Logistics – Green Logistics

NGK is working to reduce the environmental impact accompanying logistics by implementing its Green Logistics policy. A variety of measures are being used, including reduction of CO_2 emissions in logistical activity and reduction of by-product generation from packaging. We are also researching efficient transportation systems and a returnable logistics system based on the use of returnable containers, and are actively continuing our existing efforts to recover pallets and shipping boxes for reuse.

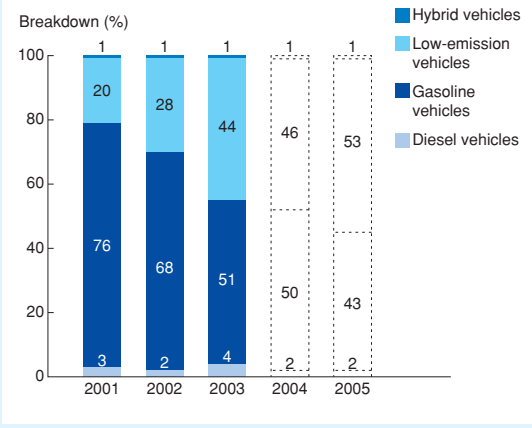
NGK's Green Logistics

Aim of Research	Concrete Measures
Reduction of CO_2 emissions	Modal shift
	Use of Green Energy
	Increase in loading efficiency
Reduction of volume of packaging materials	Returnable packaging
	Improvement of packaging efficiency

Response to the Vehicle NOx/PM Law

In June 2001, the Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides from Automobiles in Specified Areas (the so-called Vehicle NOx/PM Law) was enacted, and Aichi Prefecture was designated as an applicable region. NGK is a specific enterprise in Aichi, and under the Vehicle NOx/PM Law prepared vehicle usage and management plans and related documentation by September 2002, while introducing low-emission gasoline vehicles. Targets call for a reduction in NOx emissions in 2005 to be reduced by 25% from 2001 levels, and particulate matter (PM) emissions by 80%, while 50% of the NGK fleet will be low-emission gasoline vehicles. In 2003, NGK achieved the 2005 NOx and PM emissions targets two years ahead of schedule. To ensure moderate driving by employees and appropriate vehicle maintenance, we have prepared driving and maintenance management manuals. Together with employee education, we are implementing Green Logistics to minimize vehicle use and reduce vehicle-related environmental impact.

Transition to Low-emission Vehicles

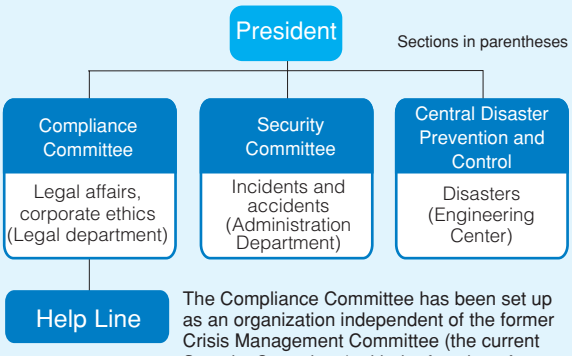


Establishment of a Corporate Governance System

As a corporate citizen, NGK is very aware of its responsibilities in being a benefit to society, both within Japan and overseas.
To this end, in order that all employees working in the NGK Group adhere to laws, regulations, and corporate ethics, we have revised the Guidelines for Corporate Behavior that were originally established in 1999, and as well as clarifying the intent of top management, are working on improving internal systems.

Improving Corporate Governance

Besides proactively promoting business activities, the construction of a system that can respond in a timely and flexible manner to risks that can be expected within the company is also an important task. We have revised the "Guidelines for Corporate Behavior," and while clarifying the policies within it, we are proceeding with upgrades of the system to implement these policies. For risk management, we have established a Central Disaster Prevention and Control Headquarters, a Security Committee, and a Compliance Committee as organizations with the president in direct control, with the aim of consistent risk prevention, and quickly and flexibly responding to issues.



The Compliance Committee has been set up as an organization independent of the former Crisis Management Committee (the current Security Committee) with the function of ensuring strict compliance with laws, regulations, and corporate ethics. Disaster control measures are consolidated in the Central Disaster Prevention and Control Headquarters. Through those reorganizations, the roles for Company-wide risk management have been explicitly clarified.

Establishment of a Compliance Committee

We have established a Compliance Committee for the widespread dissemination of the "NGK Group Guidelines for Corporate Behavior" that was revised in April 2003, and in order to operate a help line. A director who is responsible for the legal department assumes the role of chair, and in addition to the heads of main company departments, an outside counsel has been nominated as a member of the Committee. In order to further implement each employee's activities based upon the Guidelines, the "Help Line" has been newly established for consultations and reporting of problems. Details of consultations and reporting are studied by the Compliance Committee, and will be reported to the Company president or board of directors as necessary, who will then take the required action. A mechanism to protect the employees who consult with or make reports via the Help Line is also in place. This enables direct contact to be made with the outside counsel, and is aimed at maintaining the effectiveness of the system.

Pamphlet about guidelines for corporate behavior for NGK Group

NGK Group Guidelines for Corporate Behavior

■Relationship with Society

In pursuit of more openness from the management, NGK Group will improve its communication with society, and, as a good corporate citizen, will increase its contribution to the enrichment of society.
For continuous operation of the company, NGK Group finds it essential to tackle environmental problems, and will actively deal with such issues.

1. Disclosure of corporate information
   NGK Group will increase the transparency of its business activities through the fair and timely disclosure of information sought by shareholders and society in general.
2. Conservation of the global environment
   NGK Group will work to conserve the global environment and use resources effectively in all activities, including R&D, product design, production, sales, and disposal.
3. Promotion of activities that make social contributions
   NGK Group, as a good corporate citizen, will support activities that increase its contribution to local communities as well as to the international community.
4. Commitment to social order
   NGK Group will maintain healthy and appropriate relationships with political and administrative organizations and resolutely oppose any activity that threatens the order and security of society.

■Relationship with Business Activities

NGK Group will develop safe and valuable products to meet any future social demands and satisfy customers all over the world with those products. Throughout its business activities, NGK Group consistently obeys the letter and spirit of the law and conducts its business transactions fairly, transparently and freely. As a member of the international community, NGK Group respects regional cultures and customs and seeks to coexist with local communities. Profits earned through legitimate business activity are appropriately returned to shareholders.

1. Provision of beneficial and safe products
   NGK Group will supply valuable and highly reliable products at reasonable prices. Full consideration will be given to the safety of products throughout all processes, from R&D, production, and to sales, to gain confidence and trust from customers.
2. Observance of antimonopoly laws and regulations
   NGK Group will deal with its customers on the basis of free and fair competition and avoid exchanges of information or other interaction with competitors which might breach relevant laws and regulations. NGK Group will maintain fair and transparent relationships with its suppliers and deal with them according to objective criteria, as well as appropriate terms and conditions.
3. Observance of security export control laws and regulations
   NGK Group will follow its procedures in conformity with all laws and regulations concerning the security export control, which have been established to maintain international peace and security.
4. Respect for intellectual property rights
   NGK Group will encourage the creation of intellectual property and endeavor to protect and utilize it appropriately. NGK Group will also respect the intellectual property rights of third parties.
5. Care regarding entertainment and gifts
   NGK Group will keep entertainment of and gifts to clients, etc., within limits that are appropriate in terms of accepted social norms. The Group's response will be especially scrupulous where the other party is a member of an official agency, whether at home or abroad.
6. Respect for foreign cultures and customs
   NGK Group will conduct business activities not only complying with national laws and regulations but also with respect for local culture and customs.

■Relationship with Employees

NGK Group will always value people and show respect for basic human rights. All employees must obey labor laws and regulations as well as corporate regulations.
Simultaneously, they must work responsibly and in good faith, and endeavor to enhance their own abilities.

1. Respect for human rights; fair treatment
   Basic human rights must be respected and there must be no discriminatory behavior on the basis of race, nationality, belief, gender, or disability. NGK Group will provide equal opportunities and fair treatment, and there will be no toleration of sexual harassment or other forms of harassment.
2. Safe and comfortable working environments
   NGK Group will endeavor to provide and maintain safe, comfortable working environments.
3. Protection of corporate assets and information
   Employees of NGK Group will protect corporate assets and information and will not use them for illegal or unfair purposes.
4. Observance of insider trading control laws and regulations
   Employees of NGK Group will not conduct stock trade through the use of insider information, such as that of NGK Group and of its customers.

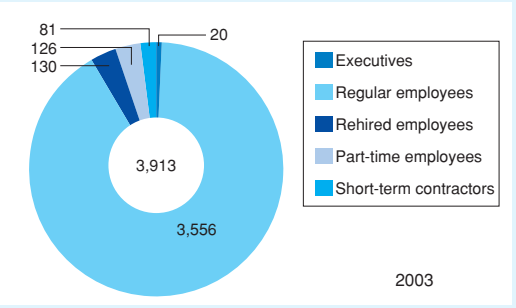
Human Rights and Employment Activities

NGK endeavors to employ personnel who are cheerful and eager to take on challenges. We also urge independence and autonomy among our employees, and are drawing up an equitable results-based treatment system, and a benefit program that lets employees work in comfort and security.

Employment Stability

NGK operates a broad array of operations, and we are therefore striving to provide a stable employment situation by drawing up employee and personnel plans that focus upon issues such as the restructuring of operations (also within Group companies) and increases in productivity.
When hiring new staff members, we carry out a policy of ongoing recruitment from a medium-term perspective, irrespective of whether the potential employees are fresh graduates or are changing employment mid-career. We have also made early moves towards the rehiring of employees who have reached retirement age, and as of the end of 2003, have rehired over 200 employees aged 60 and over. Furthermore, we are aiming for general employment stability and utilization of personnel, and we are investigating the use of dispatching companies and employment contracts in order to support variations such as those that occur when providing personnel to make up for maternity leave and temporary business loads.

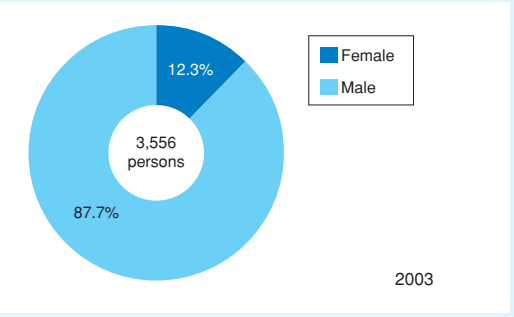
Regular and Irregular Employee Numbers



Equal-opportunity Employment

We employ personnel without regard for race, beliefs, gender, or disability, and are striving to achieve an equal-opportunity workplace. Women comprise approximately 12.3% of the workforce, and this figure includes four women in management positions. Additionally, we exceeded the legally mandated ratio of disabled employees throughout 2003, and are fully committed to implementing the intent of laws covering employment of people with disabilities in the future.

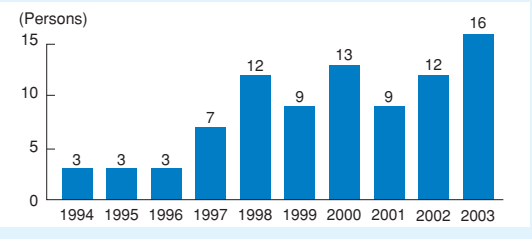
Ratio of Female Employees



Benefit Programs

We are promoting benefit programs that expand and improve upon existing systems to suit present conditions. NGK is promoting the acquisition of childcare and family-care leave in order to promote the raising of children. We are taking into account the creation of a harmonious working relationship within the Company, by concluding a labor-management agreement and establishing a grievance-reconciliation committee comprising representatives from both labor and management.

Changes in Numbers of Employees Using the Childcare Leave System



Note: Calculated from the date childcare began

Occupational Safety and Health

NGK's goal is to ensure a comfortable workplace environment, and to this end, is working toward the safety and health of all employees within our facilities, and has put forth a policy espousing this principle.

Safety and Health Policy

Safety and health are the very foundation of a company's existence, and ensuring these is a social responsibility.
Therefore, we are working in line with our Guidelines for Corporate Behavior, for the development and maintenance of a safe and clean work environment, and our aim is to ensure a comfortable workplace.

2004 Safety and Health Slogan

"Developing fundamental safety and health activities"

Safety and Health Activity Plan

NGK has decided upon specific details of the five items for our implementation of safety and health management that we are systematically promoting. These are safety and sanitation activities, external construction safety management, health management, education and training, and traffic safety.

Activity	Details of implementation	Implemented by
Safety and sanitation activities, safety activities, sanitation management	Complete implementation of "5S" (organization, neatness, cleaning, standardization, discipline) Review of risk assessment down to operator level Review and consolidation of safe operating manuals, and operator familiarity with these Dispatch a safety and sanitation manager at each site	Each plant Each factory
External construction safety management	Develop thorough gestures and calls Improve capabilities of site safety management staff, and ensure thorough site safety management	External construction safety and sanitation management committee and external construction site managers
Health management	Set up separate smoking rooms	Relevant departments, personnel department
Education and training	Safety and sanitation education for each level	Each plant, personnel department
Traffic safety	Safe driving manager, traffic-safety training and guidance for commercial-vehicle operators	Each plant

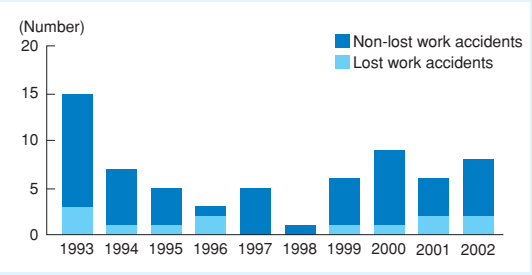
Employee Health

Having healthy employees is not only important for a company – being able to live a healthy life is a human right. NGK carries out regular health checks, and has an in-house medical-care system to make sure we have healthy employees.
From 2004, we started upon a more vigorous policy of separate smoking areas. This aims to prevent passive inhalation of second-hand smoke and to give assistance in stopping smoking. We also have a focus upon mental health, and by obtaining the cooperation of psychological counselors, are striving to attain a full mental-health service.

Work-related Accident Elimination Activities

We are striving to prevent the occurrence of disasters and work-related accidents. Since 1973, we have seen a continuous drop in the number of accidents, reaching just one in 1998. However, this number has risen slightly since then, and we are continuing with measures toward their elimination.

Changes in Numbers of Accidents



Environmental Communications

In order to further gain the trust of society through business expansion focusing on environmental conservation, it is important that we be active in information disclosure on environmental issues ourselves, and in keeping society informed of our activities. Additionally, it is important for us, as a good corporate citizen, to expand a wide range of community relations activities, and we believe that this leads to enhanced communication between society and NGK.

Environmental Report

Since 1999, the Company has issued an environmental report that summarizes NGK's environmental conservation activities. As well as covering basic Company positions on issues, the environmental report details energy-saving activities aimed at preventing global warming, recycling of production by-products, chemical substance management, Green Purchasing, and environmental accounting.

Information Disclosure on the NGK Web Site

With NGK's corporate web site, we have also made a large amount of environmental information available to the general public, from our Environmental Report to the latest facts. We are working to further increase our level of disclosure and provide even more information beyond what is covered in the report.

The NGK Environmental Activities Web Site
http://www.ngk.co.jp/english/eco/index.html

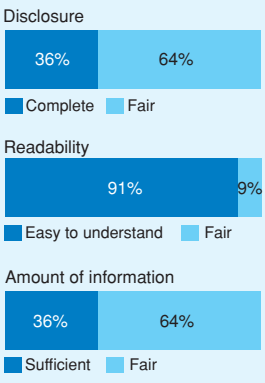
Participation via the Environmental Report Reader's Questionnaire

In response to the questionnaire provided with the 2003 Environmental Report, we received 11 comments from outside the Company. We received invaluable comments such as praise for our use of many easy-to-understand photographs and graphs, and suggestions that we explicitly list our social responsibilities. We value such comments in our business activities, and look forward to additional comments and suggestions.

Top 5 Items

- Environmentally Conscious Technologies and Products (6)
- Overall Perspective of Environmental Impact (7)
- Design and Development (5)
- CO_2 Emission Reductions (5)
- Recycling of Production By-products (7)

Disclosure



Participation in the Environmental Partnership Organization Club

NGK is a participant in the Environmental Partnership Organization Club (EPOC), which was established by a diverse group of corporations in the Chubu area of Japan. This was formed with the objective of working toward a recycling-based society, and it will also exhibit at the 2005 World Exposition, Aichi, Japan. EPOC is cooperating with the Japan Association for the 2005 World Exposition in carrying out the Backyard Tour (one of the Expo Eco Tours) within the venue, and furthermore, as a voluntary activity, plans to hold an "Eco-Talk Session" in which top leaders of EPOC member companies and the children of today, who will lead the next generation, discuss the environment.

Participation in Expo 2005 Aichi

NGK will cooperate with six other corporations to participate in the "Mountain of Dreams" Joint Pavilion at the 2005 World Exhibition in Aichi, Japan. In the "Original" zone where NGK is exhibiting (which has a floor space of 300 m^2), we plan to give a live theater presentation based around the theme of "water," using one of the world's largest immersive 3D projected videos. Our home, often called the "The Water Planet," comprises and is protected by that wondrous substance, which gives life to a panoply of life-forms. NGK is also developing a wide variety of water-related businesses, from water filters to water and sewage treatment. As well as this exhibit being a great chance to again think about the wonder and importance of water, we hope that it will be an opportunity in which people can better understand our business in this area.

Artist's impression of NGK's water-themed exhibition at Expo 2005

Advertisements

NGK provides a wide variety of products that contribute to environmental conservation, and the Company strives to keep the public informed regarding these.

NGK newspaper advertisement with an environmental-conservation theme

NGK's Community Relation Activities

The NGK Group is active in a range of community relation activities. Examples of these activities are the NGK Foundation for International Students, which provides accommodation and scholarships for international students, as well as NGK's environmental protection activities, plant tours, support for regional events, and activities being undertaken by Group companies in Japan and abroad.

From March 2001, we have issued "NGK Is Also Here," a pamphlet that introduces these activities. We hope you take the time to peruse it.

"NGK Is Also Here" introduces NGK's community relations activities.

Awards Received

(2003)

Date	Award	Granted for	Sponsor
June	Distinguished Company Award – Special Prize	HONEYCERAM® (1.9 mil, 900 cells/inch^2)	Nissan Motor Co., Ltd.
	29th Distinguished Environmental Equipment Award The Japan Society of Industrial Machinery Manufacturers' Chairman's Award	High-functionality ceramic-filter dust collectors	The Japan Society of Industrial Machinery Manufacturers
Aug.	Nagoya Mayor's Prize	Reductions in power usage in ceramics kilns	IMS 2003 Resource Recycling Production Systems Symposium
Oct.	2003 Good Design Award	C1 household water filter	Japan Industrial Design Promotion Organization
Nov.	Electrical Science and Engineering Award	NAS® battery	Electrical Science and Engineering
	Shibusawa Award	NAS® battery	Japan Electric Association
Feb.	Chairman's Award	Improvements in power saving through clean-room heat reservoir equipment	The Energy Conservation Center
	Tokai Hokuriku Department Chief Award	Distinguished energy management by 2 workers	The Energy Conservation Center
	Tokai Hokuriku Department Chief Award	Distinguished energy management by a technician	The Energy Conservation Center
Mar.	Okochi Memorial Production Award	NAS® battery	Okochi Memorial Foundation

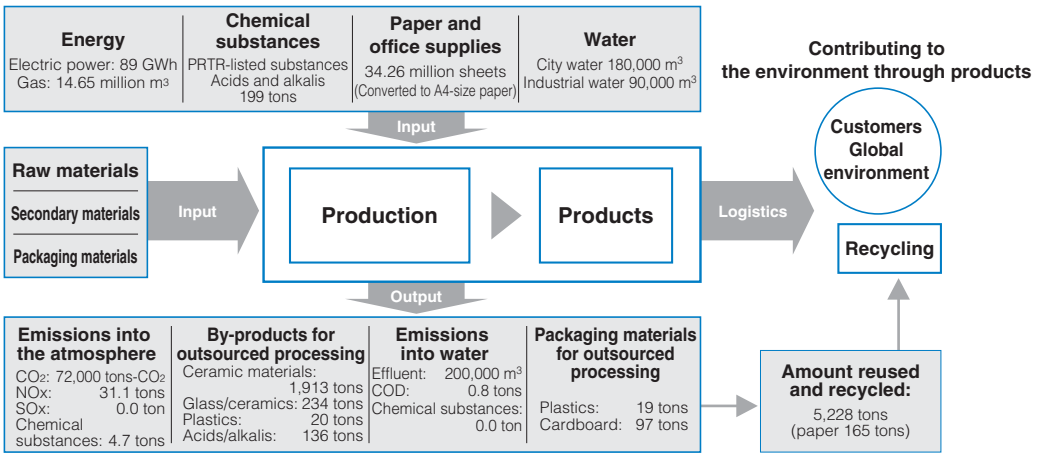
Environmental Activities by Plant

Environmental Activities at the Nagoya Plant

Nagoya Plant

●Address: 2-56, Suda-cho, Mizuho-ku, Nagoya
●Major products: HONEYCERAM®, NAS® batteries, etc.

■Representative:
Taro Kato, Executive Managing Director, Chief of the Nagoya Plant



■Measures to Prevent Global Warming

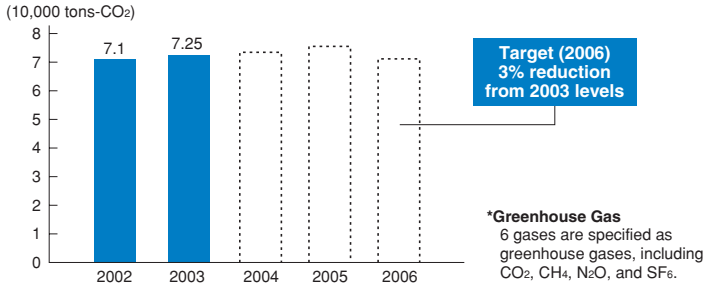
Medium-term Greenhouse Gas Control Targets
3% reduction from 2003 levels by 2006

The Nagoya Plant manufactures one of NGK's main products, the HONEYCERAM®, a ceramic substrate for catalytic converters, and this manufacturing results in emissions of greenhouse gases (containing 98% CO_2) from fuel (city gas) and electricity. In the future, we expect to see increases in production of new products such as NAS® batteries and DPFs, and experimental manufacture of new products with a corresponding increase in CO_2 emissions from energy consumption. In order to control the emissions of these greenhouse gases, while increasing production in 2003, we made efforts toward energy reductions (CO_2 emissions controls) through the introduction of the High-cycle Regenerative Combustion System, and through appropriate operation of air conditioning in clean rooms and offices. However, emissions rose by 1.8% over 2002 levels.
In response, we have drawn up a three-year plan targeted at controlling CO_2 emissions, and have started activities aimed at achieving the goal of "a 3% reduction from 2003 levels by 2006."

Activities in 2003
1) Introduction of High-cycle Regenerative Combustion System
2) Appropriate operation of air conditioning in clean rooms and offices
3) Strict compliance with Energy Management Standards
4) Energy saving activities such as turning off lights during daytime

Main Activities for the Next Three Years
1) Use of waste heat from tunnel kilns
2) Introduction of tunnel kilns mounting energy conserving combustion systems
3) Expansion of air conditioning energy conservation measures in offices and clean rooms

■Changes and Planning for Greenhouse Gas* Emissions Quantities



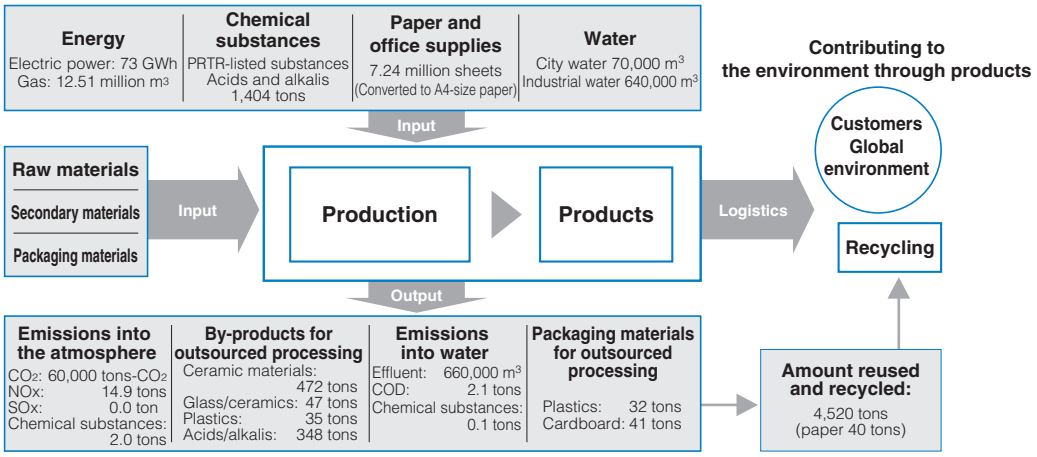
***Greenhouse Gas**
6 gases are specified as greenhouse gases, including CO_2, CH_4, N_2O, and SF_6.

Environmental Activities at the Chita Plant

Chita Plant

- Address: 1, Maegata-cho, Handa, Aichi
- Major products: Insulators, equipment for electrical transmission and distribution, ceramic products for the chemical industry, beryllium-copper strips, ceramic components for semiconductor manufacturing, etc.

Representative:
Takeyuki Mizuno, Director, Chief of the Chita Plant



Measures to Prevent Global Warming

Medium-term Greenhouse Gas Control Targets
5% reduction from 2003 levels by 2006

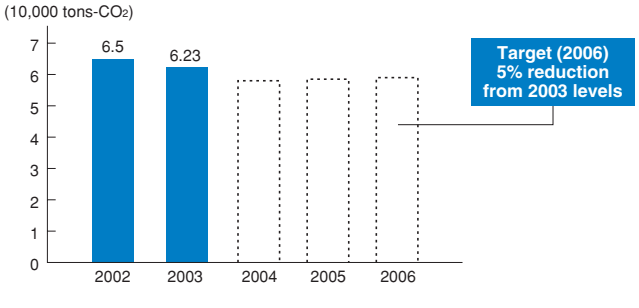
The Chita Plant manufactures items such as insulators and electrical equipment, beryllium-copper strips, ceramic components for semiconductor manufacturing, and ceramic products for the chemical industry. These emit greenhouse gases (95% CO_2) such as CO_2 from fuel (natural gas) and electricity, and SF_6 insulating gas for electronic equipment.

In order to control the emissions of these greenhouse gases, 2003 has seen us working toward energy conservation, by means that include the efficient operation of air conditioning in clean rooms and of bag filters, and by reducing the emissions of SF_6 insulating gas. These measures resulted in a 4.2% drop in emissions from 2002 levels.
As future measures, we have drawn up a three-year plan targeted at further controlling greenhouse gas emissions, and have started activities aimed at achieving the goal of a "5% reduction from 2003 levels by 2006."

Activities in 2003
1) Efficient operation of clean rooms and bag filters
2) Improvement and strict compliance with Energy Management Standards
Full-scale energy inspections by the Ministry of Economy, Trade and Industry (passed)
3) SF_6 emissions controls

Main Activities for the Next Three Years
1) Faster firing in tunnel kilns
2) Use of waste heat from tunnel kilns
3) Introduction of waste-heat boilers

Changes and Planning for Greenhouse Gas Emission Quantities

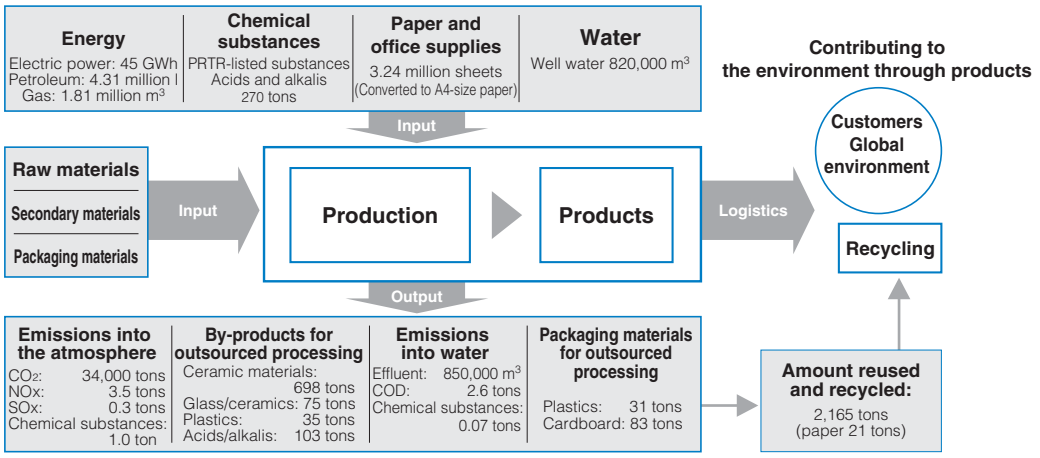


Environmental Activities at the Komaki Plant

Komaki Plant

●Address: 1155, Tagami, Futaebori, Komaki, Aichi
●Major products: Suspension insulators for electrical transmission, equipment for electrical transformation and distribution, HYCERAM®, etc.
New plants established in 2003 for the production of NAS® batteries and SiC-DPFs.

■Representative:
Eiji Hamamoto, Managing Director, Chief of the Komaki Plant



■Measures to Prevent Global Warming

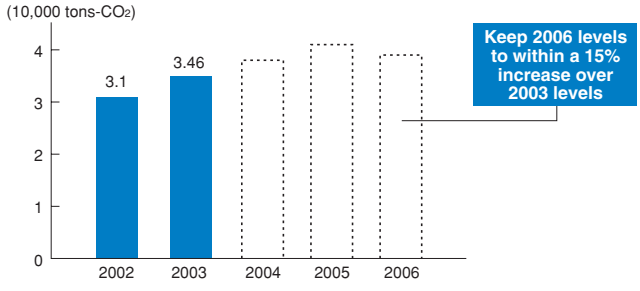
Medium-term Greenhouse Gas Control Targets
Keep 2006 levels to within a 15% increase over 2003 levels

The Komaki Plant manufactures a variety of ceramic products, including suspension insulators for electrical transmission, equipment for electrical transformation and distribution, and HYCERAM®. As the burning of fuels such as petroleum and natural gas for these firing processes is essential, emissions of greenhouse gases (100% CO_2) are unpreventable. In the future, we expect to see increases in production quantities of NAS® batteries, SiC-DPFs, and other new products, with a corresponding increase in CO_2 emissions resulting from energy consumption, including fuel and electricity.
In order to control the emissions of these greenhouse gases, in the midst of an increase in energy consumption resulting from the launch of new products, our combined efforts that include both reductions in steam amounts, and optimized operation of coolant systems has meant that we have managed to keep 2003 emissions to within a 13% increase over 2002 levels.
As future measures, we have established a new three-year plan targeted at controlling CO_2 emissions while expanding our business activities, and we have started activities aimed at achieving the goal of "keeping 2006 levels to within a 15% increase over 2003 levels."

Activities in 2003
1) Reduction in the basic unit of CO_2 emissions from main product lines
2) Improvement and strict compliance with Energy Management Standards
Full-scale energy inspections by the Ministry of Economy, Trade and Industry (passed)
3) Energy-conservation activities

Main Activities for the Next Three Years
1) Use of waste heat from tunnel kilns
2) Recovery of heat release
3) Process improvements
(Reductions in firing times, etc.)

■Changes and Planning for Greenhouse Gas Emission Quantities



Environmental Data by Plant

Actual values for exhaust gases, noise, vibration, pumped underground water, and effluent for all three plants met all relevant laws, regulations, and voluntary standards.

Standard Values (Under Laws and Agreements) and Actual Values

Category	Item	Units	Nagoya Plant		Chita Plant		Komaki Plant	
			Standard	Actual Value	Standard	Actual Value	Standard	Actual Value
Exhaust gas	Sulfur produced in combustion	%	0.5*1	(Shifted to LNG)	0.5*7	(Shifted to LNG)	0.6*8	0.0029 - 0.004
	SOx emissions	Nm^3/Hr	-	-	-	-	11.7*8	0.013 - 0.087
	NOx concentration	ppm	144*1	14 - 135	150*7	8 - 49	170*8	8 - 76
	NOx volume	g/Hr	24,500*1	23,302	-	-	-	-
	Soot and dust	g/Nm^3	0.15*2	N.D. - 0.017	0.2*7	N.D.	0.2*8	0.002 - 0.010
	Be total output plant	g/day	-	-	10*7	0.082 - 0.394	-	-
	Be output concentration in residential areas	$\mu g/m^3$	0.01*1	< 0.001	0.01*7	0.00002 - 0.00010	-	-
	Fluorine and its compounds	mg/Nm^3	(10)*9	N.D. - 8	-	-	-	-
Noise	Day	dB	70*1	37 - 67*6	65*7	50 - 63	65*5	50 - 65*10
	Night (West side of Plant)	dB	60*1	36 - 60*6	65*7(60*7)	39 - 62 (53)	-	-
Vibration	Day	dB	70*4	37 - 48	70*7	45 or less	65*5	18 - 36
	Night	dB	65*4	24 - 45	70*7	45 or less	60*5	-
Pumped underground water		m^3/day	-	-	-	-	4,023*5	2,237
Effluent	pH	-	5.0 - 9.0*3	7.1 - 7.6	5.8 - 8.6*7	6.8 - 7.3	5.8 - 8.0*8	6.4 - 7.9
	SS	mg/l	600*3	15 - 69	30*7	3 - 9	80*8	N.D. - 13
	BOD	mg/l	600*3	3.5 - 27	-	-	17*8	N.D. - 7.3
	COD	mg/l	-	-	20	1.9 - 4.2	-	-
	Total COD emissions	kg/day	-	-	59.2	16.6 or less	-	-
	Oil	mg/l	5*3	N.D. - 3.4	2*7	N.D.	2*8	N.D. - 1.3
	Copper	mg/l	3*3	N.D.	1*7	0.02	3*3	N.D.
	Zinc	mg/l	5*3	0.08	1*7	0.06	3*8	0.07 - 0.74
	Soluble iron	mg/l	10*3	N.D.	0.5*7	N.D.	10*3	< 0.08
	Soluble manganese	mg/l	10*3	N.D.	-	N.D.	10*3	0.02 - 0.07
	Cadmium	mg/l	-	-	0.1*3	N.D.	0.1*3	N.D.
	Cyanide	mg/l	1*3	N.D.	1*3	N.D.	1.0*3	N.D.
	Lead	mg/l	0.1*3	N.D.	0.1*3	N.D.	0.1*3	N.D.
	Hexavalent chromium	mg/l	0.5*3	N.D.	0.5*3	N.D.	0.5*3	N.D.
	Total mercury	mg/l	0.005*3	N.D.	0.005*3	N.D.	0.005*3	N.D.
	Total chromium	mg/l	2*3	N.D.	2*3	N.D.	2*3	N.D.
	Fluorine	mg/l	8*3	0.1	8*3	0.3	8*3	N.D.
	Nitrogen content	mg/l	-	6.9 - 9.6	10 (guideline)*5	1.4 - 4.1	10 (guideline)*5	1.4 - 2.3
	Phosphorus content	mg/l	-	2.8 - 19	1 (guideline)*5	0.02 - 0.17	1 (guideline)*5	0.02 - 0.04
	Tri-chloroethylene	mg/l	0.3*3	N.D.	0.3*3	N.D.	0.3	N.D.
	Tetra-chloroethylene	mg/l	0.1*3	N.D.	0.1*3	N.D.	0.1	N.D.
	1, 1, 1-trichloroethylene	mg/l	3*3	N.D.	3*3	N.D.	3*3	N.D.
	Dichloromethane	mg/l	-	-	-	N.D.	0.2*3	N.D.

*1. Nagoya Regulations *2. Air Pollution Control Law *3. Water Pollution Control Law *4. Vibration Control Law
*5. Aichi Prefecture Regulations or Guidelines *6. Including background noise *7. Pollution control agreement with Handa
*8. Pollution control agreement with Komaki *9. Self-imposed control *10. Adjacent to the road (includes background noise)
Background noise: Total volume of noise from unverifiable sources. Because plant noise and human activity are generally lower at night, foreground noise decreases and background noise becomes more conspicuous. (Foreground noise is noise from verifiable sources.)

pH: Concentration of hydrogen ions
SS: Suspended Solids
BOD: Biochemical Oxygen Demand
COD: Chemical Oxygen Demand
N.D.: Not Detected
Be: Beryllium
Note: Items indicated by "-" fall outside the scope of pollution control laws, pollution control agreements, and self-imposed controls.

This Environmental and Social Responsibility Report 2004 shows both our progress in line with the new medium-term management plan implemented in 2002, and the results and efforts of NGK's environmental activities. Additionally, as a new initiative, this also illustrates the activities undertaken by NGK in order to fulfill our corporate responsibilities to society, in consideration of the items regarding society outlined in the "Environmental Reporting Guidelines 2003" published by the Ministry of the Environment.

In general, our 2003 activities are on target to meet 2005 objectives. Our environmental management systems have reached the level of standards needed to obtain ISO 14001 certification, and each business group is developing Green Management aimed at promoting more effective responses to environmental issues.

We have accelerated our zero-emission activities aimed at meeting 2005 targets for the environmental impact from our production activities, and therefore expect to achieve these convincingly. In 2003, we formulated "Project E," and this has led to a comprehensive rethinking of energy systems aimed at achieving radical reductions of CO_2 emissions. Furthermore, ongoing improvements in production processes garnered through cooperation between business groups has led to reductions in CO_2. Our chemical-substance management has succeeded in dramatically reducing the quantities of these substances handled, through switching over to substitutes and updating facilities; our efforts, however, are continuing.

We are concentrating our focus on the environment in our research and development of products and technologies for environmental conservation as an activity tied closely to our operations. NGK is also making efforts on environmental communications in addition to environmental conservation activities and development of environmentally conscious products. Heretofore, NGK has not had much of a direct relationship with stakeholders such as the consumer public, environmental NGOs, and other businesses, but our aim for the future is to carry out active communication with society, and to contribute toward society's environmental conservation activities as a whole. Additionally, along with further promoting activities as a managing company of the Environmental Partnership Club (EPOC), we at NGK are carrying out our own activities. We are also proceeding with sharing information with a wide variety of stakeholders, through seminars on our various accumulated production technologies aimed at reducing environmental impact, exchange meetings, forums, community relation activities, and international exchanges. In addition, we will use our participation in and cooperation with the 2005 World Exposition, Expo 2005 Aichi, Japan, to communicate directly with the children who will lead the next generation, and we are aggressively developing activities that will contribute to society in the future.

Our society and planet are sustained by our activities, but these activities are also capable of destroying it. While using this Environmental and Social Responsibility Report as a means of better communicating with society, NGK is using this more in-depth, direct communication with our wide spectrum of stakeholders to protect the environment, further develop activities for its conservation, and attain the trust of society. We are certain that this is connected to fulfilling our corporate responsibility, and to contributing to establishment of a sustainable society.

Masanao Ono
Managing Director
and Environmental Protection
Committee Chairman
大野正直

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We are making every effort to recycle resources and protect the environment.

100%-recycled paper with 83% whiteness was used for the text of this publication and for the cover. By reusing old paper, NGK is helping to preserve greenery and making effective use of resources as well as reducing waste.

This report was printed with soy ink, which uses reduced levels of oil-based solvents compared with conventional inks. By using soy ink, we are reducing petroleum-product consumption and cutting emissions of volatile organic compounds (VOCs), a cause of atmospheric pollution during printing.

This report employs waterless printing, which reduces the burden on the environment caused by toxic waste liquids emitted during conventional printing. This environmentally friendly printing method meets all the laws and standards for prevention of water pollution and Green Purchasing and places very little impact on the environment.

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