

NSK Ltd.
**ENVIRONMENTAL
REPORT**
2001

Since the industrial revolution of the late 18th century, human beings have made remarkable progress. Development of industrial technology and an increase in scientific and medical knowledge allowed the world's population to grow rapidly, and a great number of people have been able to work toward a better life and pursue material abundance.

Approaching the late 20th century, however, it became apparent that the precious global environment had been negatively affected by our demanding standards of living. Awareness has been fostered among people that the protection of our planet is a critical responsibility, to be shared by all countries, all organizations, and all people, and that action must now be taken.

For the sake of future generations, discussions and emotional reactions are clearly not enough, we need to take immediate sustainable measures.

At NSK, we are serious about our environmental responsibility. Our actions may have only a small impact on the whole planet, but we are committed and determined that our environmental procedures will continually be undertaken with an eye towards the future.

NSK was a pioneer in first releasing Japanese-made bearings, since then, our products have been used in a variety of applications including machinery, automobiles, and home appliances. Our technologies and products reduce the friction associated with rotating parts thereby saving energy consumption and playing a significant role in energy conservation. During product development, the utmost consideration is given to the entire lifecycle of our products to ensure that they have the smallest environmental impact possible. Further, we believe that at NSK all areas of business operations should make a consistent effort to ensure environmental protection.



The era of mass-production, mass-consumption, and mass-disposal has come to an end and the need for optimum production, optimum consumption, and minimal disposal is in place. Entering the 21st century, we are clearly becoming an environmental society that is globally aware. One of the most serious challenges in our global business operations is to ensure sustainable growth while leaving a beautiful environment for future generations. NSK is now leading the way with the implementation of corporate-wide environmental programs to confront all environmental issues presented to us, benefiting from our position as the pioneering bearing manufacturer and as a powerful contributor to the growth of the machinery industry.

Message from the President

In 2001, the Ministry of the Environment released its Environmental White Paper stating that Japan shall become an environmentally aware country and is appealing for a nationwide commitment to becoming a recycling-oriented society. In entering the new “century of the environment,” entities that are involved in socioeconomic activities need to manage global environmental issues in a responsible manner.

NSK has long been active in environmental management, and this year, we will launch a focused practice of environmentally aware business management that will be positioned as the key factor in our resolution to transform our business management model. Environmental actions will be expanded from manufacturing department initiatives to corporate-wide programs. Employees will be able to take pride in the performance of our environmental protection programs, which will ensure our credibility in the community. We intend to focus on the development of new environmentally friendly products, which shall integrate the excellent technological prowess of the entire NSK Group, allowing us to continue to contribute products that better the environment.

Although environmental programs at NSK are at an introductory stage from a global standpoint and also from an anticipated long-lived activity standpoint, we will demonstrate leadership that will inspire responsibility and duty in all manufacturing industries. We will focus on, and be committed to the structuring of corporate management in order to promote a recycling-oriented society.

This environmental report is the first in our history, and is designed to project a clear understanding of any present or future steps we undertake with regards to environmental protection. A further objective of this report is to welcome candid criticism or suggestions from not only our stakeholders including, investors, stockholders or suppliers, but also from NGO's and the local communities where we have operations. Such valuable input will be taken into account when planning our environmental protection initiatives.



Tetsuo Sekiya
President & CEO

Deepening Cognizance of Global Environmental Protection

The primary objectives of manufacturers include producing goods and materials, but the natural cycle of the environment can be seriously affected by business operations.

NSK created an Environment Control Department in 1975 to address air pollution and water contamination issues. Since then, this department has audited pollution control procedures and compliance, as well as provided appropriate technical advice for pollution control at all manufacturing sites.

However, as the depletion of the ozone layer and global warming began to emerge as a critical problem worldwide, existing pollution control measures were no longer sufficient. In 1991, the policy to pursue global environmental protection was printed in the company's corporate philosophy, and subsequent activities were started under the new performance standard of global environmental measures.

Formation of the Global Environmental Protection Committee

Growing concerns about health and environmental hazards caused by the depletion of the ozone layer, led to NSK founding the Committee on the Comprehensive Management of Fluorocarbon Regulations in 1990. This committee was reformed in 1993 as the Global Environmental Protection Committee to cover broader aspects of environmental protection.

In order to carry out special missions to facilitate problem solving at the production facilities which generate significant environmental demands, the assigned committee members were general department managers from manufacturing, engineering, general administration, and purchasing. This committee was composed of four special subcommittees: Energy Conservation (global warming), Waste Reduction, Hazardous Chemical Substances Management (chemicals in products), and the Environmental ISO Certification Promotion Project Group. Each subcommittee develops optimum action plans to be aligned with the common objective across all operations facilities and each department implements these plans under the supervision of the committee. Performance of activities is managed by our environmental management policy, and methods are also presented in the work group meetings and energy management meetings for the purpose of mutual learning, information exchange, and horizontal propagation of case studies.

Furthermore, new subject matter subcommittees are formed periodically, to focus on such issues as the networking of affiliated companies on environmental management, company vehicle logistics, and the control of chemical substances used in manufacturing.

Development of a Voluntary Action Plan

In 1988 an international conference was held in Canada concerning climatic changes. Subsequently in 1992, governmental institutions from 179 nations gathered at the United Nations Environmental Development Conference (World Summit) in Brazil and began forming an international framework to prevent global warming. A Global Environmental Protection Committee was formed in 1993, and NSK moved forward following each action plan—energy conservation, emission and waste reduction, and hazardous chemical substances control as part of global environmental measures. 1997 saw the launch of Keidanren's Global Environment Charter of the Japan Federation of Economic Organizations (Keidanren). As a member of the Japan Bearings Industry Association, NSK seized the opportunity to be proactively involved in this voluntary action plan in 1998.

Establishment of NSK's Environmental Policy

In the corporate philosophy issued in 1991, NSK clearly expressed an intention to pursue global environmental protection and reinforced this promise by implementing action plans for environmental management. We established the new NSK Environmental Policy in December 1997 to aggressively address environmental issues associated with all business operations connected to not only production, but also the development of goods and technology. The policy highlights the need for symbiotic technology, the reduction of demands placed on the



environment, contribution to the building of a healthy and wealthy society, and the importance of being a good global citizen; the guidelines for environmental practices were also laid down.

NSK production sites are located throughout Japan and overseas, therefore, location specific environmental policies were drawn up to ensure that each plant harmonizes with the local environment.

Development of Products, which Contribute to the Betterment of the Environment

NSK's fundamental goal behind technology and product development is the enhancement of tribology technology, which is essentially the control of friction. Tribology technology could be explained as the "science or technology of the relative motion of two surfaces in contact," or in short, the "study of friction and lubrication."

The R&D in which NSK has been involved throughout our history can be described with this concept in mind. Years of steady and formidable effort have enabled NSK to develop proprietary technology in broad fields and applications such as lubrication, friction, abrasion and oil film dynamics, materials technology, processing technology, analysis and



measurement assessment technology, electromagnetic systems technology, and ultra-precision positioning technology. Taking advantage of such technologies, NSK has offered a variety of products that contribute to energy and resource conservation and environmental improvement.

Acquisition of ISO Certification for the Environment

Since the manufacturing division has a greater potential impact on the environment, in 1997, NSK began working on acquiring ISO 14001 certification by formulating company-wide guidelines for the introduction of international standards for ISO 14001 environmental management.

In Japan, certification has already been achieved by production facilities and affiliated companies engaged in manufacturing and sales under the NSK brand. At present, other affiliated companies engaged in manufacturing parts and machines are working to establish the internal environmental management system or acquire ISO 14001 certification. Overseas, an environmental management coordinator was assigned to operations in the American, European, and Asian regions, while an environmental management supervisor was assigned to each factory. These steps are a part of NSK's aggressive tackling of environmental protection issues.



Shift from Working on Issues Involved with Products and Manufacturing to Reforming Management

NSK has been addressing various environmental protection measures centered around issues such as product development, manufacturing processes, and waste management.

Great consideration is now given to promoting structural reforms that are rooted within the perspective of building a recycling oriented society. In March 2001 the Management Innovations Project Team was created as per a directive from the president; formation of the Environmental Stewardship Group followed in order that plans for tackling environmental issues could be improved and taken to a higher level. Placing this as a core project in NSK's environmental action plan, is considered a priority for business management issues at all levels company-wide.

Reformation of the Environmental Management Organization

After launching the Management Innovation Project, the organizational approach to environmental issues was reorganized to network across horizontally aligned functions. The Environmental Stewardship Group coordinates environmental issues management and functions horizontally in the organization. The Global Environmental Protection Committee drives the implementation of environmental action plans. In the previous management system, this committee was responsible for issues of environmental protection solely within a production facility. In March of this year, this committee was put in charge of environmental management on a corporate basis.

More specialized committees were formed for Products, Manufacturing, Logistics, Procurement, and General Administration. A board director responsible for each function was assigned to be a member of each specialized committee relevant to the director's function. As a result, this newly empowered committee clearly carries authority and responsibility. No change was made to the chairmanship; a board director or equivalent chairs a subject matter committee. The Environmental Stewardship Group assumed the supervision of overseas operations.

Challenging New Specialized Subcommittee Issues

Upon formation of the Environmental Stewardship Group, steps were taken to ensure environmental protection systems

were in place in the areas of Products, Logistics, Green Office, and Green Procurement.

Environmental Products Subcommittee

Although the Chemical Subcommittee played a primary role in the handling of materials used in products which impact the environment, the Environmental Products Subcommittee was organized in consideration of the need for R&D to understand environmental demands throughout the product life cycle, from raw materials to final waste disposal. Environmentally friendly products will be developed while the LCA (Life Cycle Assessment) methods are considered, and product standards will be enforced to meet environmental needs.

Logistics Subcommittee

In the area of distribution, major steps towards the reduction of environmental demands were taken with the introduction of low-pollution vehicles and the promotion of eco-driving. The Logistics Subcommittee was organized to promote corporate-wide activities. This committee will tackle the reduction of emissions such as CO₂ or NO_x during transportation, as well as promoting the use of eco-friendly packaging.

Green Office Subcommittee

Environmental measures at our head office have included the recycling of paper, waste separation, and the conservation of electricity and water. We recognized the need to integrate these activities across the group, and the Green Office Subcommittee was set up to provide leadership to all, including



branch offices, and affiliate offices; it also fosters an environmental mindset.

Green Procurement

Hazardous chemical substances management based on our own standards, and independent green procurement of copy paper, OA units, and vehicles based on voluntary action plans were already in the implementation phase. NSK developed the Green Procurement Standard and the Guidelines for Green Purchasing and began implementation. Hereafter, it will be applied to all procurement and purchasing groups. With the support of our suppliers, we will take steps towards creating a recycling-oriented society.

Introduction of Environmental Accounting

NSK began applying environmental accounting practices in 1999 to enable cost effective environmental management based on a better understanding of the cost and benefits of environmental protection measures, and for the disclosure of such activities to society in a quantitative manner. NSK has formulated its policies based upon the guidelines released by the Ministry of the Environment in May 2000, and is conducting accounting in accordance with these policies.

Executive Manager's Remarks



Isamu Terao
Executive Vice President
Environmental Management

Since the establishment of the Global Environmental Protection Committee in 1993, NSK has placed major emphasis on the implementation of the voluntary environmental protection action plans for our production sites.

All midterm goals were fully accomplished by the end of FY2000 as scheduled and goals addressing global warming, waste control measures, and hazardous chemical substances are right on track. In product development, NSK introduced environmentally friendly products such as, the POWERTOROS UNIT Half Toroidal CVT and low-torque ball bearings, both of which demonstrate excellent energy efficiency, compactness, and lightweight, and consequently contribute to energy and resource conservation.

Our achievements so far only illustrate our future potential. Further improvements will be sought in areas such as the reduction of global warming gases and hazardous chemical substances, the promotion of recycling activities, the alignment of the product life cycle program in R&D, public relations for our environmentally friendly products, and the disclosure of our environmental achievements. As a result of this evaluation, NSK started the new environmental programs in March this year, focusing on environmental stewardship as part of the Management Innovation Project. Through these continuous efforts, NSK will enable corporate-wide environmental management by strengthening the environmental management system and pursuing an environmentally aware business management model.

Corporate Profile

Company Name

NSK Ltd.

Establishment

November 8, 1916

Capital

Approximately 67.2 billion yen (as of March 31, 2001)

Head Office

Nissei Bldg., 1-6-3 Ohsaki, Shinagawa-Ku,
Tokyo 141-8560, Japan

Telephone

03-3779-7111

President and CEO

Tetsuo Sekiya

Major Business

Manufacturing and sales of bearings, automotive products,
precision machinery and parts, mechatronics products

Number of Employees

Consolidated: 23,283 (as of March 31, 2001)
Unconsolidated: 8,135 (as of March 31, 2001)

Annual Sales (consolidated)

533,144 million yen (fiscal year ended March 31, 2001)

Affiliates & Subsidiaries

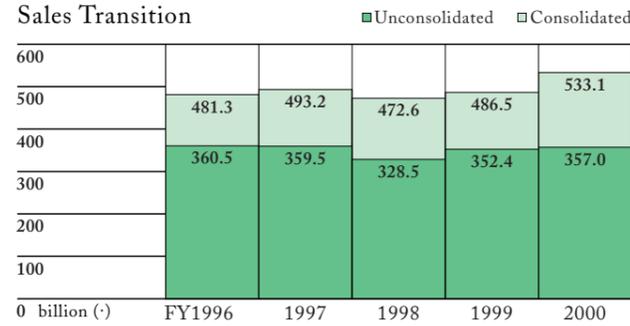
90 companies (as of March 31, 2001)
Domestic companies including NSK: 34
Overseas companies: 56

Global Production Network



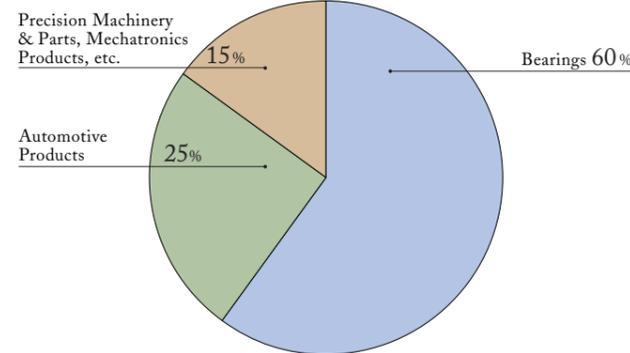
Please see p. 13 for more information about the production system in Japan.

Sales Transition



Sales by Product in FY2000

Consolidated Sales: ¥533.1 billion



Scope of the Report

The scope of activity is as listed below.

Companies that are Subject to NSK's Environmental Management:

- NSK Ltd.
- NSK Micro Precision Co., Ltd.
- Inoue Jikuuke Kogyo Co., Ltd.
- NSK Torrington Co., Ltd.
- NSK Autoliv Co., Ltd.
- NSK-Warner Kabushiki Kaisha
- NSK Kyusyu Co., Ltd.
- Shinnippon Koukyu Co., Ltd.
- Chitose Sangyo Co., Ltd.
- Asahi Seiki Co., Ltd.
- Shinwa Seiko Co., Ltd.
- Nissei Urawa Corporation

Voluntary Action Plan Performance Data Collected from the Following Plants:

- Fujisawa Plant
 - Shiga Ishibe Plant
 - Shiga Otsu Plant
 - Maebashi Plant
 - Soja Plant including Akagi Branch Plant
 - Saitama Plant including Saitama Precision Machinery and Parts Plant
 - Fukushima Plant
 - Kirihara Precision Machinery and Parts Plant
 - NSK Autoliv Co., Ltd.
 - (site sharing with Kirihara Precision Machinery and Parts Plant)
 - Tamagawa Plant
- Data was collected from 1993 to 2001 with the exception of the Tamagawa Plant—data collection ended in 1998 due to the plant's closure.

Activity Period

FY2000 (April 2000 through March 2001)

Performance data was collected during this time period but the contents of this report cover data collected through June 2001.

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- 27 **Initiatives Taken at Each Plant and Group Company**
 - Initiatives taken at each plant
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 - 31 ● Saitama Plant
 - 32 ● Fujisawa Plant/Fujisawa Technology Department
 - 33 ● Kirihara Precision Machinery and Parts Plant/NSK Autoliv Co., Ltd.
 - 34 ● Shiga Manufacturing Division (Otsu Plant, Ishibe Plant)
 - Initiatives taken at affiliated companies
 - 36 ● NSK Torrington Co., Ltd. (Haruna Plant)
 - 36 ● NSK-Warner Kabushiki Kaisha
 - 37 ● NSK Kyusyu Co., Ltd.
 - 37 ● Inoue Jikuuke Kogyo Co., Ltd.
 - 37 ● NSK Micro Precision Co., Ltd.

Corporate Philosophy

NSK aims to contribute to the well-being and safety of society and to protect the global environment through its innovative technology integrating Motion and Control. We are guided by our vision of NSK as a truly international enterprise, and work across national boundaries to improve relationships between people throughout the world.

NSK Environmental Policy

Our commitment to environmental management is essential for our existence and our pursuits.
We are determined to take independent and assertive actions.

1. Overall Goals

To create a harmony between people and the Earth by developing environmentally friendly manufacturing processes and technology, such as our Tribology friction control technology, using the full efforts of all employees and all departments in our company.

2. Reduction of Environmental Demands

To establish and continually improve an environmental management system, comply with regulations, prevent pollution and reduce environmental demands.

3. Contribution to Society

To be a good global corporate citizen, contributing to the social development of countries and communities where we operate, and also to advance the realization of affluent societies that are in concord with the environment.

Environmental Code of Conduct

1. To reform environmental management organizations, by improving operational systems and clarifying chains of responsibility.
2. To develop products and technology that will decrease environmental demands.
3. To tackle environmental protection more aggressively by setting our own self-disciplined regulations in addition to complying with laws, ordinances and agreements.
4. To ensure energy and resource conservation, waste reduction, and recycling in all spheres of our business operations.
5. To convert from ozone-depleting materials and hazardous chemical substances to environmentally friendly alternative materials, and where possible switch to alternative processes and technologies.
6. To communicate with environmental authorities and local communities in order to receive insightful and constructive opinions.
7. To contribute to local communities through participation in social environmental activities.
8. To encourage employees to understand our environmental policies and to ensure an environmental mindset in the company through education and internal communications.
9. To disclose the ongoing status of our environmental management activities to the public when necessary.



Tetsuo Sekiya
President and CEO, NSK Ltd.
December 12, 1997

NSK's Environmental Management

We have been diligently working on environmental management based on NSK's environmental policies, and have further strengthened our environmental management system while aggressively pursuing the acquisition of ISO 14001 certification. The system integrates activities across all functions horizontally, therefore, we can effectively pinpoint issues as required at each site, whether it is an office or a manufacturing plant. We are also developing environmentally friendly products and reducing environmental demands throughout our business operations. We are committed to being a highly trustworthy corporation with an esteemed brand reputation.

Voluntary Action Plans

In 1993, NSK formed the Global Environmental Protection Committee and set voluntary action plans that defined concrete goals by category mainly for the manufacturing department, as midterm goals terminating at the end of FY2000. Progress was monitored every year and all goals were surpassed by the end of FY2000.

With that accomplishment, we developed further voluntary action plans as our next midterm goals by adding the new categories of products, procurement, and logistics that are in process now.

In addition, we are continuing to take action towards acquiring the international standard of environmental management systems ISO 14001 certification in more fields.

Major Categories and Performance in Regards to Midterm Goals for the End of FY2000

The midterm goals terminating by the end of FY2000 were set mainly for the manufacturing department. As listed below, performance exceeding the goals was achieved.

Category	Goal	Performance
Anti-global Warming Measures	Reduction of as much as 16% of unit energy consumption per value added output by FY2000 (Base year: FY1990)	Reduction of unit energy consumption: 17.6% (Achieved)
Waste and Recycling Measures	Reduction of as much as 70% of unit waste per output by FY2000 (Base year: FY1990)	Reduction of unit waste: 78% (Achieved)
Measures for Hazardous Chemical Substances	Establishment of a management system for products containing high-environmental impact substances Elimination of dichloromethane use by end of 1999	Definition of hazardous chemical substances and management system put in place in 1997 (Achieved) Elimination by August 1999 (Achieved)
Environmental Management Systems	Acquisition of ISO 14001 certification by end of 1999 by all manufacturing sites in Japan Acquisition of ISO 14001 certification by end of FY2000 by five NSK brand manufacturing affiliated companies	Acquisition by December 1999 (Achieved) Acquisition by June 2001 by five companies

Major Categories for Mid and Long Term Goals

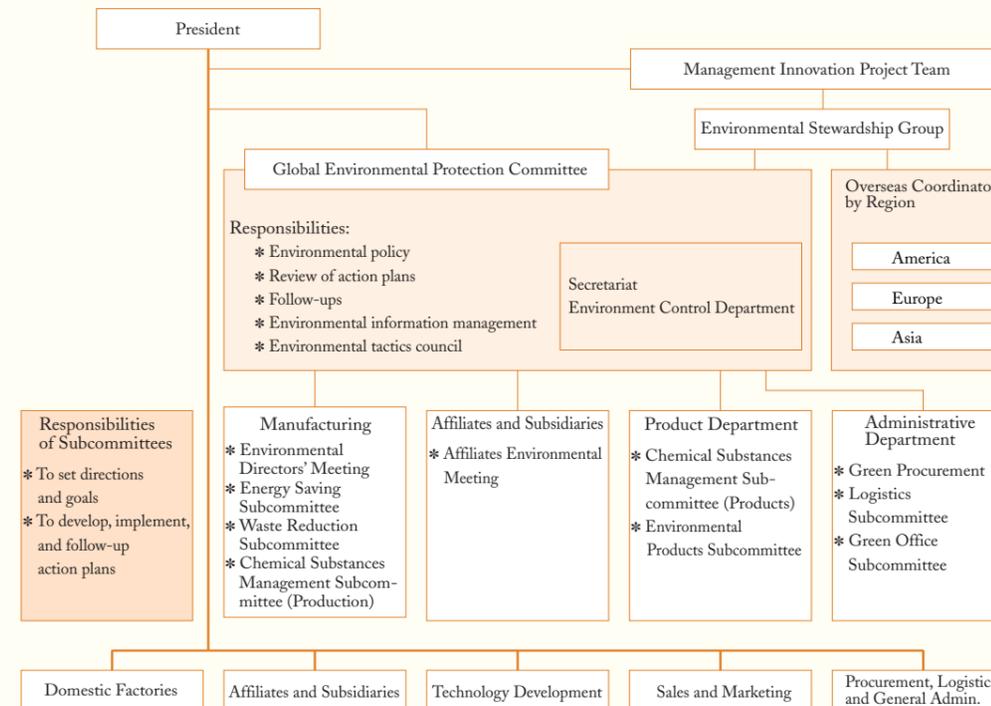
Product development, procurement and logistics that were conventionally handled individually by each concerned department, have become categories in the corporate-wide midterm goal.

Category	Midterm Goal
Manufacturing	Anti-global Warming Measures Reduction of unit energy consumption per value added output and unit CO ₂ emissions: 23% by 2010 (Base year: FY1990)
	Waste and Recycling Measures Recycling performance: 98% min. by FY2010 Zero emissions by three manufacturing sites by FY2003
	Measures for Hazardous Chemical Substances Elimination of CFC-11, 12, and 13 by FY2005 Elimination of halon based extinguishers from all sites by FY2005 Quickest and greatest possible reduction or elimination of other hazardous chemical substances
Environmental Management Systems	The acquisition of ISO 14001 certification or the establishment of in-house environmental systems by FY2003 at both our five affiliates which manufacture NSK brand components and machinery, and our overseas manufacturing sites
Product Development	Promotion of environmentally friendly products • Development of environmentally friendly and strategic products • LCA implementation on representative products from each of the product lines: Bearings, precision machinery and parts, and automotive products • Reduction of environmentally hazardous substances
Procurement	Adoption of the green procurement standards and the guidelines for green purchasing
Logistics	Reduction of environmental impact substances (CO ₂ , NO _x) emitted during transportation Promotion of eco-friendly packaging (reduction of packaging materials)

Environmental Management Organization

NSK corporate-wide environmental activities are under the direction of both the Environmental Stewardship Group, whose function is environmental issue management from a corporate

viewpoint, and the Global Environmental Protection Committee, which implements environmental protection programs.



Global Environmental Protection Committee—Activity History

Category	1993	1994	1995	1996	1997	1998	1999	2000	2001
Voluntary Action Plans	1st voluntary action plan								2nd voluntary action plan
Global Warming Measures	1st plan				2nd plan				3rd plan
Waste and Recycling Measures	1st plan		2nd plan		3rd plan		4th plan		
Measures for Hazardous Chemical Substances	Chemical Substances Management	Establishment of chemical substances management system for products containing substances with high-environmental impact						Establishment of a manufacturing processes management system	
	Ozone-depleting Materials	Elimination of cleaning chemicals from all sites							Reduction of CFC for refrigeration
	Chlorinated Solvents	Elimination of trichloroethylene from all sites		Elimination of dichloromethane from all sites					
	Dioxin Control	Elimination of incinerators from all sites						Conversion to chlorine-free lubricating agents	
Pollution/Environment Hazards Management	Legal compliance				Environmental hazards management/environmental demands				
Logistics Management	Elimination of PVC/foamed PS packaging			Introduction of returnable packing materials		Automotive committee	Logistics subcommittee		
Establishment of Environmental Management System	NSK Environment Policy Statement	Establishment							
	ISO 14001	NSK domestic site						Affiliates and subsidiaries/overseas operation	
	Environmental Accounting	Start-up of environmental accounting							
Environmental Audit	Audit of legal compliance		Audit of performance		Audit of system and support		Audit of affiliates and subsidiaries		
	Environmental Disclosure							Launch of website	Status report on annual report

Auditing Methods

Environmental activities are improved through continuous auditing of the environmental management system and activities in place, as detailed below.

1. ISO 14001 Certified Plants, Affiliates, and Subsidiaries

• System Audit

Audited once a year by a third party auditor and in-house auditors, certified by the third party auditor. Depending on the situation, the audit can be done by an in-house auditor commissioned by the environment control department of the head office.

• Performance Audit

Policy compliance management by the Energy Saving, Waste Reduction and Chemical Substances Management Sub-committees organized under the Global Environmental Protection Committee.

• Audit by Statutory Auditor

Annual audit of management activities by the statutory auditor.

2. ISO 14001 Non-Certified Sites of Affiliates and Subsidiaries

Periodic audit of system and performance, by the environment control department of the head office, implementing the guidelines for managing affiliates and subsidiaries.

Acquisition of ISO 14001 Certification

In order to improve the quality of business management, NSK has integrated its environmental conservation activities and is in the process of establishing an environmental management system.

We believe that the acquisition of the international standard ISO 14001 is key to establishing this environmental management system. Because each of our sites located worldwide have unique conditions both geographically and in the types of products they manufacture, it is necessary to include certification activities in our independent action plans.

1. Domestic Manufacturing Sites

Acquisition activities started at each manufacturing site in 1997. Following the Fukushima plant in July 1998, all domestic plants completed acquisition of ISO 14001 by December 1999.

2. Domestic Affiliates and Subsidiaries

The target five companies that manufacture and market NSK brand products obtained certification by June 2001. The other five companies manufacturing parts and machines are making an effort to build proprietary in-house environmental management systems or are preparing for acquisition of ISO 14001 certification. One of the five is supposed to obtain ISO 14001 certification by August 2001.

3. Overseas Manufacturing Sites

Each site is tackling environmental issues aggressively under the supervision of environmental coordinators assigned to the regions of America, Europe, and Asia and also an environmental management supervisor based at each site.

Four sites obtained ISO 14001 certification in FY2000, and 12 sites in total have acquired it to date. The remaining sites will obtain certification by FY2003 or are also planning to form their own in-house environmental management systems by FY2003.

Status of ISO 14001 Certification

Fiscal Year	Domestic Manufacturing Sites	Domestic Group Companies	Overseas Manufacturing Sites
FY1997 (Apr. 1997 to Mar. 1998)			NSK Bearings Europe Ltd., Blackburn (U.K.) Nov. 1997 NSK Korea Co., Ltd., Changwon (Korea) Dec. 1997
FY1998 (Apr. 1998 to Mar. 1999)	Fukushima Plant July 1998 Saitama Plant Sept. 1998 Shiga Ishibe Plant Oct. 1998		NSK Steering Systems Europe Ltd., Coventry (U.K.) Oct. 1998 NSK Bearings Europe Ltd., Peterlee (U.K.) Dec. 1998
FY1999 (Apr. 1999 to Mar. 2000)	Fujisawa Plant Sept. 1999 Shiga Otsu Plant Nov. 1999 Maebashi Plant Dec. 1999 Soja Plant Dec. 1999	NSK Autoliv Co., Ltd. Nov. 1999	Waelzlager Industriewerke Bulle AG (Switzerland) Nov. 1999 ISC Micro Precision Sdn. Bhd., Malaysia (Malaysia) Dec. 1999 NSK Brasil Ltda., Suzano (Brazil) Jan. 2000 PT. NSK Bearings Manufacturing Indonesia Ltd., Jakarta (Indonesia) Mar. 2000
FY2000 (Apr. 2000 to Mar. 2001)		NSK Kyusyu Co., Ltd. Oct. 2000 NSK Torrington Co., Ltd. Jan. 2001 Inoue Jikuuke Kogyo Co., Ltd. Feb. 2001 NSK-Warner Kabushiki Kaisha Mar. 2001 NSK Micro Precision Co., Ltd.*1	NSK Bearings Europe Ltd., Newark-Linear (U.K.) May 2000 Siam Nasteck Co., Ltd. (Thailand) Nov. 2000 Neuweg Fertigung GmbH (Germany) Jan. 2001 NSK Steering Systems Europe Ltd., Peterlee (U.K.) Feb. 2001

*1 Acquisition of ISO 14001 certification completed in June 2001

ISO 14001 Certified Domestic Sites



Environmental Accounting

Environmental accounting is an effective resource for tackling environmental issues and is also useful in providing information that can be disclosed to the public so that they can better understand our environmental measures and performance. Best described as a business management tool that shows the status of

◎ Purpose of Environmental Accounting

NSK introduced environmental accounting for the purposes listed below.

1. Practical Application from an Inside Administrative Perspective

- To understand performance compared to the expenditure and investment of environmental protection.
- To enable effective cost management.
- To foster a mindset of environmental integrity and cost consciousness in employees.

2. Practical Application from an Outside Administrative Perspective

- To enable disclosure of environmental protection activities to the public in a quantitative way.
- To improve corporate quality, evaluation, and reputation.

◎ Data Compilation Methodology

Data was compiled in the following way in FY2000.

1. Scope of Activity and Organization

- Operations at NSK core manufacturing sites and technical departments

2. Quantification Criteria for Environmental Conservation Costs

- Expenditures and investments correspond to the Ministry of the Environment's guidelines
- Five-year straight-line depreciation (Depreciation for the past five years should be booked in FY2000)
- Booking of composite costs by prorating each environmental activity

3. Quantification of Effects from Environmental Activities

- Reporting of material effect (material unit) and economic effect (monetary unit), both from environmental activities
- No consideration of deemed effects such as, risk hedge effects, made-up contribution profits

4. Accounting Term

- Starting April 2000 through March 2001

environmental protection activities in a quantitative manner, environmental accounting is still in the trial stages at NSK and needs to be improved for better reporting. In FY2000 the methodology used to collect and compile data was developed with guidance from the Environmental Agency.

◎ Resultant Compiled Data

1. Environmental Conservation Costs

The costs incurred in FY2000 were 0.87 billion yen in total investments and 4.78 billion yen in total expenditures.

A characteristic aspect of the compiled data, were large expenditures for R&D as much as 39% of the total investment or 0.34 billion yen, and 38% of the total expenditure or 1.83 billion yen. This figure for R&D in FY2000 was attributed to new environmentally friendly product development with a concentration on a longer product life cycle, lighter weight, and greater energy efficiency.

Environmental damage costs were unusually high, as much as 34% of total expenditures or 1.64 billion yen, this was due to the expenses incurred for the remediation of oil contaminated soil, which cost 1.6 billion yen, at the closing of the Tamagawa plant located in Ota-Ku, Tokyo in July 1999.

2. Environmental Conservation Effects

• Economic Effects

Only data supported with evidence was compiled for a total of 0.14 billion yen.

• Material Effects

Energy and water consumption were both markedly improved compared to the previous year. Since waste measures were almost close to being completed last year, there was not such a dramatic change, however, steady improvement was observed.

Costs and effects of environmental conservation are detailed in the following chart.

◎ The Next Step

The development of an information system that will use environmental accounting to help environmental management decisions. In addition, data will be compiled more efficiently and will be more informative. Environmental performance shall be improved by collecting broader data with environmental accounting.

Environmental Conservation Costs in FY2000

Category	Investment		Expenditure	
	Amount (Millions of yen)	Main purpose	Amount (Millions of yen)	Main purpose
1. Business area Costs	360.0	• Introduction of oil separator, oil recovery facilities • Introduction of battery driven forklifts	389.7	• Repair, inspection, maintenance of environmental facilities • Repair, inspection, maintenance of drainage facilities
(1) Pollution prevention costs				
(2) Global environmental costs	111.3	• Introduction of energy-efficient equipment	87.1	• Energy saving measures
(3) Resource circulation costs	24.5	• Introduction of solidifying machine for grinding swarf • Introduction of chilled water automatic blowing controller systems	358.2	• Recycling/reduction of waste • Disposal of general/industrial waste
Subtotal	495.8		835.0	
2. Upstream/downstream costs	0		48.2	• Green purchasing of paper and stationery • Recyclable and returnable packaging
3. Management activity costs	0		293.1	• Personnel costs for environmental protection organization • Maintenance and operation of ISO 14001 • Environmental training and education • Measurement and analysis of environmental impacts
4. Research and development costs	342.6	• Introduction of R&D facilities for new eco-friendly products	1,833.0	• R&D personnel and administrative costs of new eco-friendly product development
5. Social activities costs	5.4	• Landscaping and forestation	126.4	• Cleaning inside fences, construction and maintenance of landscaping • Participation in clean campaigns and donations to environmental groups
6. Environmental damage costs	30.7	• Introduction of remediation facilities • Research and analysis of soil	1,641.3	• Maintenance of remediation facilities • Soil remediation at the former Tamagawa plant
Total	874.5		4,777.0	

Effects of Environmental Activity in FY2000

Economic Effects (Monetary unit)

Category	Amount (Millions of yen)
Cost saving by energy conservation*1	106.4
Cost saving by waste reduction*1	5.1
Income of valued materials obtained by waste recycling*2	13.9
Total	135.4

*1 Including five-year investment from FY1996 through FY2000
*2 Salvaged value from sales to affiliates and subsidiaries

Material Effects

Category	Compared to Previous Fiscal Year
Unit energy consumption	4.1% improvement
Water consumption	7.1% improvement
Unit waste disposal quantity	3.7% improvement
Waste recycling ratio	0.7 point improvement

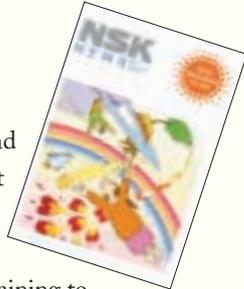


Environmental Education

Creating the right mindset in our employees is critical in order to motivate them to carry out environmental activities. NSK provides environmental education and self-development programs for its employees, and is further planning to enhance the training of in-house auditors and promote the acquisition of legal qualifications.

◎ Environmental Education and Enlightenment

As part of NSK's ongoing education and training, head office employees learn about our environmental activities from our annual report. At manufacturing sites, NSK conducts thorough education and training to ensure that environmental knowledge and environmentally unique technology is shared by employees of all levels from the front line to managers and supervisors, in accordance with the provisions of ISO 14001. Our employees' environmental mindset will be reinforced through an educational campaign that includes articles on the Intranet and in our in-house newsletter, NSK News. The people of NSK will learn about environmental issues on a daily basis.



◎ In-house Auditor Training

In-house auditors not only conduct audits at each manufacturing site, they also provide the leadership to develop environmental awareness at manufacturing sites. So far, 122 in-house auditors including 67 senior auditors have been internally certified through training organized by a third party training institute in addition to the internal refresher course. Employee development will remain a continuing priority.

◎ Acquisition of Legal Certification

NSK has always encouraged employees to obtain a certification for national licenses, for the purpose of training and employee development. We intend to increase the number of people who have legally certified licenses relevant to environmental management thereby improving the quality of our environmental management system.

Statistics of Legally Certified Licensees (as of March 2001)

Field of Certificate		Number of required personnel	Number of licensed personnel
Pollution Control	Air pollution	10	21
	Water pollution	2	26
	Noise	4	11
	Vibration	4	13
High Pressure Gas	Specified high pressure gas handling officers	1	5
	High pressure gas handling officers	0	10
	Safety management officers	43	69
	Refrigeration safety officers	3	3
	Production safety officers		
Licensed Energy Managers	Thermal energy	4	9
	Electric energy	8	17
Licensed Electrical Engineers	Class 2	8	12
	Class 3	2	6
Fire Laws	Hazardous materials officers	72	174
	Class A	0	8
	Class B1	0	2
	Class B2	0	1
	Class B3	0	1
	Class B4	34	333
Class B5	0	2	
Handling of Specified Chemical Substances		7	54
Handling of Toxic and Deleterious Substances		0	2
Administrator of Industrial Waste Subject to Special Control		9	22
Certified Measurer		0	4

Note: Statistics from each manufacturing site



External Activities

Each manufacturing site strives to build better community relations through volunteer work such as can collections or the clean-up of vacant lots. Also, NSK management and employees voluntarily support the NSK welfare fund.



Wildlife Fund Japan for their work in maintaining beautiful natural areas in Japan and for protecting wildlife from illegal trading.

Employees in Shiga Otsu and Ishibe deposit part of the fund in a savings account, and the interest is used for environmental activities. Officially named the Environmental FUREAI Savings Account it is often referred to it by its nickname "Mizusumashi," which means whirligig beetle.

◎ NSK Welfare Fund—FUREAI Club

After deliberating about how to contribute to society, NSK established the NSK welfare fund, FUREAI Club, meaning "friendship association." More than 50% (4,500) of NSK employees support the club. The funds from a portion of our charitable activities in Tokyo are used to support the World

◎ Support Association

The executive management of Japanese corporations located in the mid-economic zone have formed an Environmental Partnership Club. Supportive of activities that reduce environmental demands create a recycling oriented society, they organize occasional forums to exchange insight into environmental issues and share experience obtained in experimental field practices.

Dealing with the Life Cycle of Our Products

Our goal is to develop a total plan for reducing environmental demands by understanding the influences caused by not only our products themselves but also by their overall life cycles from raw materials to manufacturing, and transportation to use, and final disposal. Here, we list the achievements of NSK and our future targets with regards to the environmental impact caused by product development, manufacturing, logistics, and procurement.

NSK products, which are not readily visible, contribute to the conservation of the environment by facilitating the smooth operation of industrial machinery, electrical appliances, motor vehicles, air conditioners, refrigerators, etc. In order to reinforce activities, the Environmental Products Subcommittee has been established to actively promote the development of products which shall contribute to the environment.

Policies

We have been actively involved in the expansion of tribology technology, which is the control of friction, and have aggressively been promoting its practical application. Products built with this technology are well known for their reduced environmental impact due to improved friction resistance, longer operating life, compactness, and high speed.

Furthermore, to decrease the environmental impact of the usage and disposal of our products, we have worked towards the abolition of some hazardous chemical substances and the reduction of others.

The Environmental Products Subcommittee has organized activities to achieve the following goals.

1. Create environmentally friendly products.
2. Develop LCA¹ and set stricter criteria for environmentally conscious design.
3. Promote the acquisition of the Eco Mark.

Development of Environmentally Friendly Products

NSK has produced a great variety of technologies. With materials, we have established a technology that extends product life even under severe usage conditions, by minimizing non-metallic inclusions and improving heat treatment technologies.

By enhancing material and heat treatment technologies, NSK's originally developed Super-TF Bearing has achieved a life cycle 10 times longer than the existing carburized steel bearing under severely contaminated environments. We have also concentrated on developing a technology that achieves further product compactness, weight reduction, accuracy, and uniform compatibility with peripheral components. Thus, machinery incorporating NSK products has become smaller, lighter, more reliable, and saves energy and natural resources.

The Hub Unit Bearings used in automobile shafts is useful for reducing weight and frictional losses and for

enhancing reliability by integrating flanges, ABS sensors, and driving shafts.

Measures for Hazardous Chemical Substances

The measures for hazardous chemical substances are totally managed by the Chemical Substances Management Subcommittee for products under the Internal Management Regulations of 1997. In the regulations, the substances are classified into one of four categories—banned, controlled, monitored, and semi-monitored—in accordance with the levels of the hazards. This allows strict control while also abolishing and reducing the usage of hazardous chemical substances.

We will reduce the use of grease containing lead that has been used in minute amounts for specified bearings, and also promote the removal of chrome, especially hexavalent chrome contained in trace amounts in the surface-treated parts of the seal shield of bearings, through the increased application of a tin coating.

Development of Environmentally Friendly Grease

The life cycle of grease-sealed bearings is determined by seizure following the deterioration of the grease. For over 30 years we have worked to formulate higher performance grease with a longer life cycle.

Products using NSK original grease have contributed to the reliability and longer operating life of machines as well as minimizing environmental impact. We have also worked to eliminate hazardous chemical substances when developing grease.

NS7 Grease² not only enhances product performance but it is also biodegradable, decomposing itself with microorganisms that inhabit the soil, rivers, and the ocean. In FY2000, we used 80 tons of NS7, employing it in a wide range of products.

Future Activities

Product development had always been measured in performance terms, such as depreciation of frictional losses and longer operating life. From hereon, it is clearly important for us to consider the environmental effects a product has throughout its entire life cycle, from the raw materials stage on through manufacturing, distribution and usage, beginning from the product development phase; to apply the LCA, a quantitative evaluation of these effects; and to provide this information to our users.

Led by our Environmental Products subcommittee, at NSK we are firmly committed to strengthening our product development by creating products that are less destructive to our eco-systems.

*1 LCA: Life Cycle Assessment

*2 NS7 Grease: NSK's first product to acquire the Eco Mark.

Based on tribology technology that reduces friction and enhances efficiency, we have developed products that are friendly to the global environment, saving energy and natural resources.

The following are major products in each industrial field.

Bearings

◎Low-Torque Bearings for Fan Motors and Vacuum Cleaner Motors (GR™ Series)

Household electrical appliance manufacturers have found it necessary to significantly improve the operating efficiency of their products. In response, we have developed low-torque ball bearings for use in vacuum cleaner motors and air conditioner fan motors.



GR™ Series Bearings

In comparison with current bearings, dynamic friction torque has been reduced by 40-50%, by modifying the internal features of the bearings. Thus, this product is kind to the global environment, and improves the efficiency and energy savings of household electrical appliances.

Precision Machinery and Parts

◎Linear Guides and Ball Screws Equipped with the NSK K1™ Lubrication Unit

While linear guides and ball screws are generally lubricated by forced intermittent oil or grease, these lubrication methods each have problems. Forced intermittent oil lubrication wastes large amounts of lubricating oil, requires costly piping and equipment, and contamination occurs due to deterioration and produces the emission of foul odors. Grease lubrication requires periodic maintenance, and can also rapidly degrade in harsh operating environments. To respond to these issues, we have produced the NSK K1™ lubrication unit.

NSK K1™ lubrication units are made of "Molded-Oil™," a special material developed by NSK consisting of lubri-

cating oil and resin. A pair of NSK K1™ lubrication units, on either side of the grease-packed nuts of a ball screw or on either end of the ball slide of a linear guide can supply lubricating oil at an optimum rate over a long period of time to the sliding surfaces and adjacent areas.



Linear guides and ball screws equipped with the NSK K1™ lubrication unit

Linear guides equipped with NSK K1™ do not require lubrication replenishment and realize maintenance-free operation for more than 25,000 km.

Automotive Components

◎Half-Toroidal CVT POWERTOROS UNIT

Measures to reduce CO₂ emissions and save energy are a priority for the automobile industry when considering their impact on the global environment.

CVT^{*1} is an unprecedented variable transmission system that can decrease fuel consumption by 20% or more in comparison to conventional automatic transmissions.



Half-Toroidal CVT POWERTOROS UNIT

After expending much time and effort in the development of the Half-Toroidal CVT, NSK has succeeded in the practical application of the POWERTOROS

UNIT, the core component of Half-Toroidal CVT, in commercially manufactured vehicles. Attracting widespread global attention, the Half-Toroidal CVT can be used in large-sized vehicles over 3,000 cc. This innovation won both the JSME Medal for New Technology from the Japan Society of Mechanical Engineers and the Nikkei Best Product & Service Award from the Nippon Keizai Shinbun.

◎Electric Power Steering (EPS)

Unlike conventional hydraulic power steering, EPS^{*2} improves energy consumption by 3-5% as it only uses power when the steering wheel is turned by the driver.

Because it contains no oil, it has the distinct advantage of never polluting the environment in either production or final disposal.



EPS (Column Type)

EPS is expected to promote automatic steering as a user-friendly technology that should ultimately reduce traffic accidents.

*1 CVT: Continuously Variable Transmission

*2 EPS: Electric Power Steering. EPS is available in three types: a column type in which the reduction gear is mounted on the column, located directly under the steering wheel; a pinion type in which the reduction gear is attached to the pinion of the rack and pinion assembly; and a rack type where the motor and rack are arranged on the same shaft, and the ball screw reduction gear is located on the rack.

Anti-global Warming Measures

In 1993, we made a plan to reduce unit energy consumption by 10% per value-added output by FY2000, in comparison to that of FY1990. In 1996, we successfully exceeded this target by a significant amount; therefore we revised our goal to 16% reduction. The performance result of FY2000 reached 17.6%, which again highly surpassed our goal.

Measures and Policies

Expanding on our policy that already focused on energy efficiency, we have increased activities to promote the use of clean energy. We have been pursuing measures in the following areas:

- Reduction of fixed energy (decreasing the consumption of energy while machinery is not in operation, and the consumption of energy that is appropriate to the load that machinery is driving or bearing.)
- Replacement of existing equipment with more energy efficient models.
- Improvement of and compliance with the management standards for energy equipment.
- Careful control of energy consumption.
- Conversion to natural gas usage.

We have also been innovative in production by employing lean manufacturing. Thoroughly eliminating wastefulness in this area will improve efficiency and lead to energy savings.

Water is considered an invaluable energy resource at NSK and we make great efforts toward reducing our water

consumption. The over flowing of water has been reduced by the installation of automatic blowing controller systems in cooling towers for the cooling of equipment. We also installed additional flow meters for flow regulation, and are conducting regular inspections of the piping to check for leakages.

Achievements during FY2000

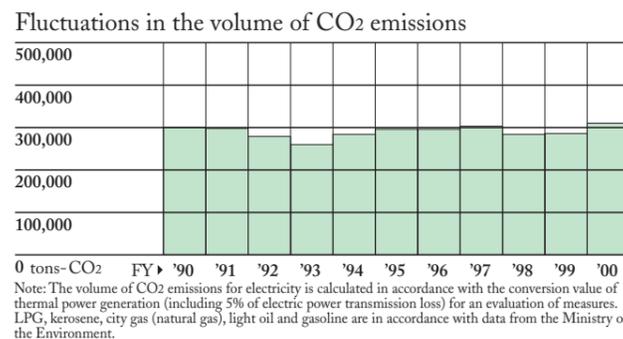
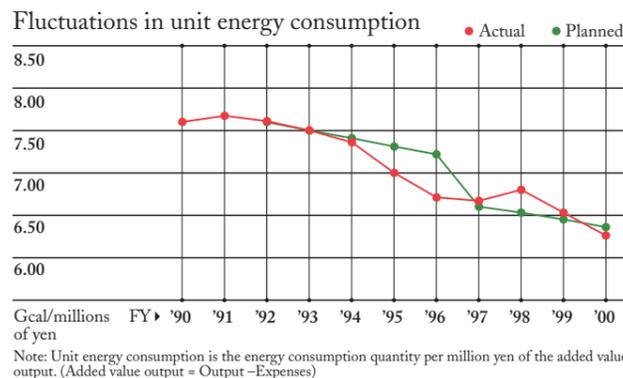
- The Saitama plant introduced inverter compressors as the compressed air controller to regulate the number of compressors. Since this properly monitored loads, energy savings of 270 Gcal/year were achieved.
- The Ishibe plant in the Shiga Manufacturing Division replaced butane for air conditioning and heat treatment with city gas (natural gas). About 2,200 tons of CO₂/year for the volume of CO₂ emissions was reduced.
- The Otsu plant in the Shiga Manufacturing Division enhanced operating capacity by improving the feeding of products to the furnace. This included

developing a more rational process of heat treatment. As a result, the energy saved was approximately 3,600 Gcal/year.

- As an example of production innovation, at the Soja plant we have successfully enhanced our production efficiency by 20% in the steering intermittent gear assembly lines.
- Additionally, NSK took the opportunity to further review the air conditioning program as changes to product line-ups are made. We have been using energy-saving air conditioners as well as inverter-type pumps and fan motors; we have converted to high-efficiency motors and lighting apparatus; and we have also been implementing periodical checks for air leakage.

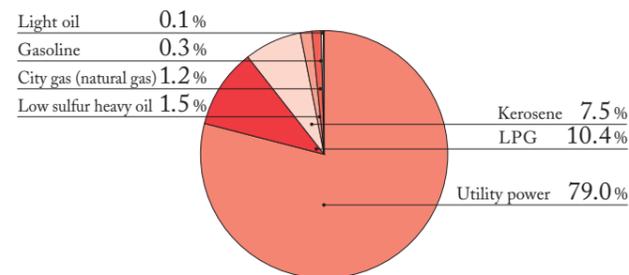
Future Activities

A co-generation system will be introduced which is extremely efficient at converting heat into energy from the heat that is discharged through power generation. From a partial review of our tabulation standards, we plan to reduce our unit energy consumption by 23% per value-added output by FY2010, in comparison to that of FY1990, as our next mid to longterm goal.

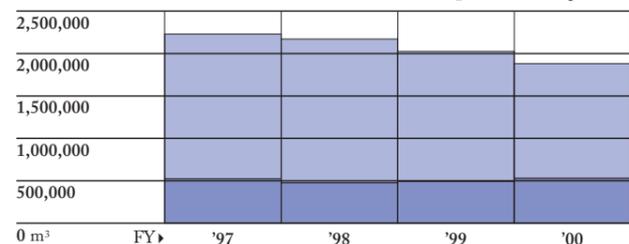


Note: The volume of CO₂ emissions for electricity is calculated in accordance with the conversion value of thermal power generation (including 5% of electric power transmission loss) for an evaluation of measures. LPG, kerosene, city gas (natural gas), light oil and gasoline are in accordance with data from the Ministry of the Environment.

Breakdown of energy consumption



Fluctuations in the volume of water consumption



Waste Reduction and Recycling Measures

Since 1993, we have taken steps to meet our goal of reducing waste disposal volume by 70% of FY1990 levels by FY2000. Under the initiative of the Waste Reduction Subcommittee, which develops measures for handling waste and recycling, we have formed a plan based on the principle of the 3Rs (Reduce, Reuse, and Recycle), and have achieved a 78% reduction (recycling ratio of 89%) in FY2000, successfully exceeding our goal.

Measures and Policies

We are contributing to the formation of a recycling oriented society by promoting the 3Rs.

- Reduce
Control waste generation (reducing the amount of paper used, more precise stock removal, usage of oil that has a longer life cycle, etc.)
- Reuse
Reusage (returnable and recyclable packaging, usage of used grinding stones in other process areas, etc.)
- Recycle
(recycling of grinding swarf, and recyclable plastics, etc.)

swarf into briquets was installed to reduce outside commission fees and enhance recyclability. Further, the grinding coolant contained in the grinding swarf was collected during the solidifying process. This provided an effective reuse of resources.



Solidified grinding swarf

Reducing the generation of scrap metal

In the forging process of the outer and inner rings of bearings, metal scrap is produced. At the Saitama plant, the process of forging was optimized to reduce the volume of this metal scrap. As a result, we succeeded in a reduction of 14 tons per year.

Promotion of wood chips recycling

At the Maebashi and Soja plants, wood chips such as packing wastes were incinerated. However, we have recycled them into charcoal which is used to adjust the moisture under the floors of the building. As a result, 40 tons of wood chips were recycled per year.

Future Activities

We have focused our activities on finding a solution to the lack of final disposal sites. From hereon, we will make an active commitment to creating a recycling-oriented society. Our next targets are to achieve a zero emissions^{*1} rating at three plants by FY2003, and to improve our recycling ratio to a minimum of 98% by FY2010.

Along with the further careful implementation of the 3Rs, challenging issues will be met with the concentrated efforts of every plant and the achievements and expertise gained will be expanded to other plants as model activity in order to efficiently achieve our targets.

The aforementioned in-house solidifying of grinding swarf is an example of an activity that is part of a model plan. This will be expanded to other plants.

*1 Zero emissions: defined as the disposal volume of direct entrusted reclaim (final disposal volume) being less than 1% of total waste.

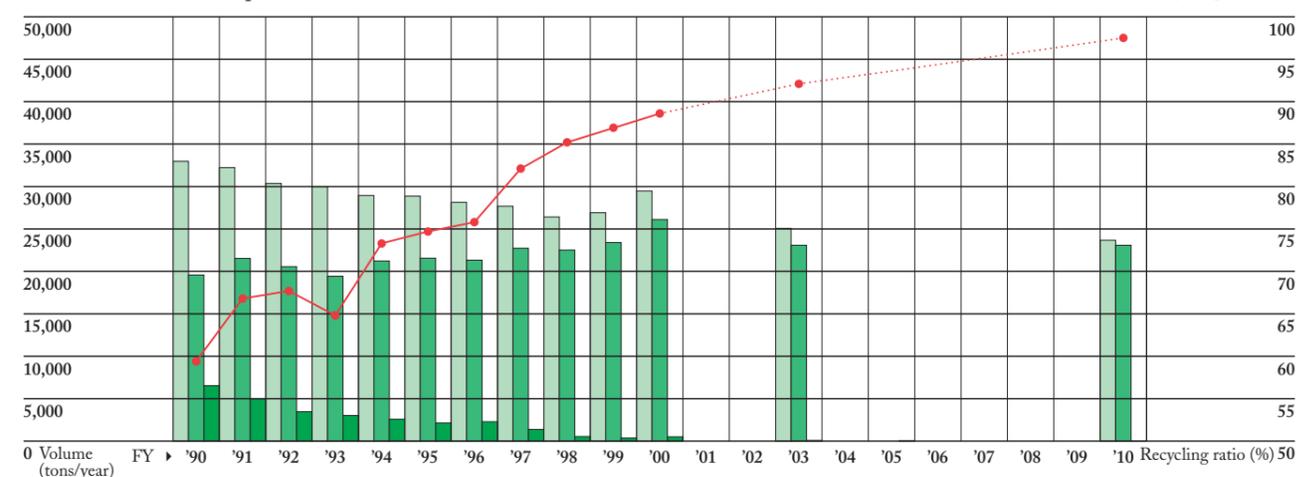
Major Measures for FY2000

In-house solidification of grinding swarf into briquets

During the manufacturing of bearings, swarfs are produced in the grinding process.

NSK promoted the recycling of solidified grinding swarf as steel and cement materials, and achieved total recycling by 1998. Furthermore, at the Otsu plant in the Shiga Manufacturing Division, equipment to solidify grinding

Fluctuations and plans for the recycling ratio and the volume of final disposal



Note: The final disposal volume and recycling ratios (volume) are indexes that have been newly adopted for FY2001. This is different from the waste volume (intermediate and final disposal volume) that was the index used until FY2000.

Measures For Hazardous Chemical Substances

We established the Chemical Substances Management Subcommittee for production, in addition to the Chemical Substances Management Subcommittee for products. The subcommittee established guidelines for the management and classification of hazardous chemicals in production, classifying the chemical substances—substances to prohibit, to reduce, and to curtail emissions—it also carries out the management and operation. Furthermore, we have worked towards the total elimination, reduction of usage amounts, a switch to alternatives, and the reductions of emissions of the substances to be managed.

Measures and Future Activities

© Ozone layer depleting substances

By introducing new manufacturing systems (cleaning machinery, vacuum dryer), ozone layer depleting substances used in the cleaning processes (CFC-113/1,1,1-trichloroethane), were totally abolished in 1994.

Our next goal is to eliminate designated CFC gases (CFC-12•13) used in freezers by the end of FY2003, and to gradually reduce CFC-11 along with a comprehensive review of air conditioning systems that includes policies to prevent global warming. Halon used in fire extinguishers is to be eliminated by the end of FY2005.

© Chlorinated organic solvents

Trichloroethylene, a suspected carcinogenic substance, was abolished in May 1994. Dichloromethane had been used at some plants due to the accuracy problem in cleaning precision parts. It was totally abolished in August 1999 because of our improved cleaning technology.

© Dioxin

All waste incinerators ceased operation in order to eliminate toxic dioxin. Safety is confirmed by soil analysis.

We are also promoting the use of a non-chlorinated machining oil agent as an alternative to our current machining-oil agent, which contains a chlorine additive.

© Apparatus utilizing PCBs

PCBs are excellent for insulation, they resist decomposition even under high temperatures, and are chemically stable, hence, they have been used as insulators for transformers and condensers. However, in 1972 their toxicity became apparent and further production and usage was prohibited. Any use or disposal of remaining apparatus containing PCBs is as mandated under the Waste Disposal and Public Cleansing Law.

At NSK, existing equipment with PCBs such as high- and low-pressure condensers, (99 units of high-pressure condensers and 195 units of low-pressure condensers) are kept under strict control.

Furthermore, we have conducted a fact-finding survey on PCBs in lighting equipment. 439 units of fluorescent lights, which are now in use, are controlled and will be systematically replaced. As soon as administrative authorities are equipped with the facility to handle and dispose of PCBs, we shall dispose of our PCB equipment.

Complying with the PRTR Law

In accordance with the PRTR pilot project overseen by the Ministry of the Environment and the PRTR guidelines provided by the Japan Federation of Economic Organizations, we have reported the control conditions of PRTR-subject substances.

354 substances were defined as substances to be reported under the PRTR Law*1. Before this law went into effect, we began the cleanup of such substances including a total abolishment of chlorinated organic solvent for cleaning (CFC-113, trichloro-ethylene 1,1,1-trichloroethane dichloromethane), the reduction of grinding coolant additive 2-aminoethanol, as well as halon used in fire extinguishers, and substituted ones with CO₂.

Seven substances were subject to reporting in FY2000, and a total of 115 tons were treated. Based upon the total results we continue to reduce consumption and/or emissions of these substances.

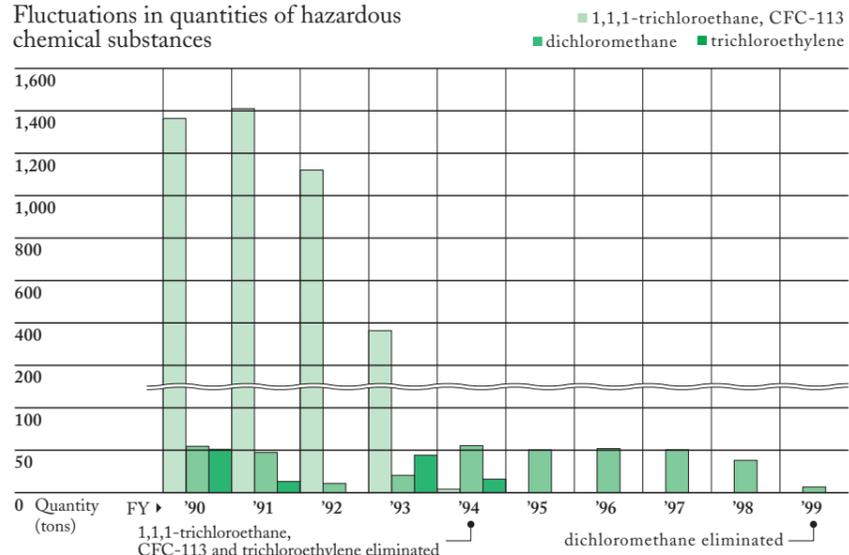
*1 PRTR Law: Pollutant Release and Transfer Register

Research results for PRTR substances (FY2000)

Substance code	CAS code	Substance name	Number of sites using substances	Volume to be treated (tons/year)
16	141-43-5	2-aminoethanol	3	9.3
24	None	n-alkylbenzenesulfonic acid and its salts	1	1.2
63	1330-20-7	xylene	8	74.9
224	108-67-8	1,3,5 trimethylbenzene	2	2.7
227	108-88-3	toluene	4	22.3
304	None	boron and its compounds	1	3.5
309	9016-45-9	poly(oxyethylene)-nonylphenyl ether	1	1.1

Note: At each site, annual volume of treated substances exceeding 1 ton is subject to reporting.

Fluctuations in quantities of hazardous chemical substances



Anti-pollution and Environmental Hazard Measures

NSK is working actively to preferentially procure materials that lessen demands on the environment, and switching to alternative materials and curtailing usage quantities. This would minimize the negative effects of the chemical substances and machinery used in manufacturing process on the air, water and soil. Moreover, we are aggressively promoting the introduction of production systems, incidental and pretreatment machinery that reduce negative environmental impacts.

Air Conservation

Air conditioning and heat treatment are the primary NSK activities that affect atmospheric conditions. At air conditioning facilities we have taken steps to diminish soot and smoke by switching from using heavy oil to low sulfur heavy oil, kerosene, and liquefied petroleum gas (LPG) for use as fuel. As a result, sulfur oxide emissions and dust density have been far below emission standards. During the hardening process in heat treatment, an electric dust precipitator eliminates the oil mist generated.

In response to concerns over the toxicity of dioxin we have ceased operating all incinerators. As we remain firmly committed to air conservation, we continue the usage of natural gas as opposed to other fuel sources as countermeasures for global warming.

Water Conservation

The quality of wastewater is affected by runoff from grinding processes, the cleaning fluids that are used in heat treatment processes, and waste runoff from barrels, etc. Outside contractors were previously given the work of processing these emulsion wastes due to the difficulty in processing wastes containing surfactants.

Now at Fukushima, Fujisawa, Saitama, and from September at the Maebashi plant we have evaporating concentrators in place to distill runoff and separate grinding coolant from water before disposal.

To enhance the effectiveness of the overall monitoring systems and accelerate responses to accidents, each plant has an oil-water separation tank and a retarding basin at the point of discharge as well as a monitor for constant readings of the

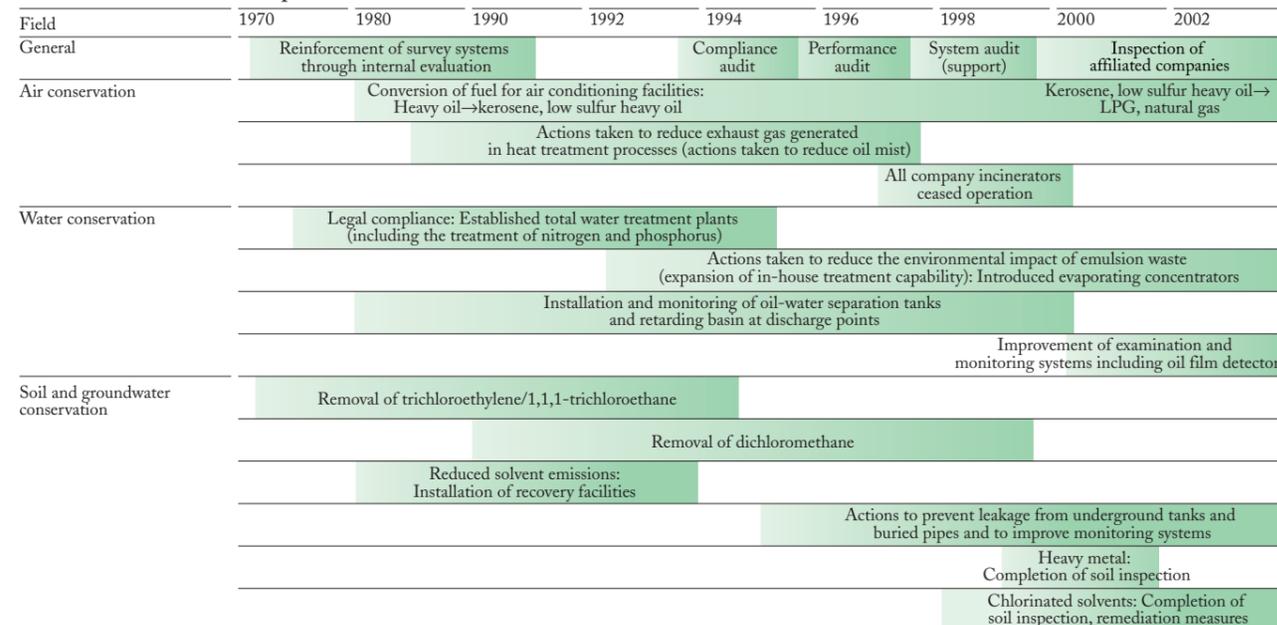
pH meter.

We will continue to decrease negative environmental impacts and will aggressively pursue further water recycling solutions.



An evaporating concentrator at the Saitama plant

Preventative measures for pollution and environmental risks



Soil and Groundwater Conservation

◎ **Response to environmental hazards**

- In order to eliminate sources of chlorinated organic solvents, we abolished the use of 1,1,1-trichloroethane and trichloroethylene in parts cleaning processes in 1994, and of dichloromethane, which had been used in some of the cleaning machinery, in 1999.
- Inspections of soil and groundwater contamination have been completed in accordance with guidelines set by the Ministry of the Environment. We have been conducting detailed inspections to detect chlorinated organic solvent contamination through soil boring tests at multiple sites even in cases where the density of soil gas was low. Contamination was detected at three plants and remediation measures have been duly implemented. Detailed inspections for contamination caused by heavy metals revealed no contamination because historically only trace amounts of these metals were used in the operations carried out at these facilities.
- Taking the above measures ensures that there will be no new risks of soil and groundwater contamination caused by chlorinated organic solvents or heavy metals.
- NSK has drawn up guidelines for the testing of soil and groundwater contamination to be used when purchasing or selling land both in Japan and overseas.
- Since 1995 we have installed leakage prevention layers on underground tanks and elevated buried pipelines at facilities located on soft ground. The direct burial of new tanks is prohibited, therefore, installment is made above ground, in double-layer chemical storage tanks or in basement structures allowing for six-sided inspections. To prevent oil and other leakages, periodic inspections, including airtightness tests, are conducted on buried pipelines.

◎ **Remediation measures for chlorinated organic solvents**

During inspections conducted at 3 worksites, contamination which was caused by chlorinated organic solvents and that exceeded environmental standards was found both in the areas where cleaning machinery are located and in storage areas. While the contamination was limited and posed no threat outside the compound at all three plants, the regulatory authorities were informed and remediation measures were implemented to eliminate further problems. Completed at one plant in FY2000, treatment will continue at the two remaining plants. Periodic monitoring of the compound boundaries of each of the plants is ongoing and no abnormalities have been reported.

◎ **Remediation measures for oil and other leakage accidents**

While we did not find any serious hazardous chemical contamination upon inspection of the soil at the Tamagawa plant prior to its closure in July 1999, we did find some oil pollution caused by leakage in the buried pipelines. A soil remediation process was instituted in which oil-contaminated soil was separated from uncontaminated soil, and was heat-treated in a drying oven.



Soil remediation plant at the former Tamagawa plant site

Complaints from Local Residents and Regulatory Requirements Violations

In FY2000, three complaints concerning noise and one complaint concerning odor were received from local residents and all complaints were addressed. Additionally, there were two cases where pH level limits were exceeded. All cases were caused by the effects of photosynthesis by algae, and countermeasures have since been implemented.

Measures and Policies

◎ **Reducing environmental impact of transportation and delivery activities (Lowering emissions of CO₂ and NO_x gases)**

1. Enhancing efficiency of transportation and loading capacity.
- Streamlining the number of vehicles and shortening mileage through a review of major principal routes.
- Raising the efficiency of loading capacities by promoting joint deliveries.
- Establishing distribution centers.
- Introducing “milk run” regular routes.
2. Introducing low-emission vehicles.
3. Conducting thorough vehicle maintenance.
4. Promoting “Eco-driving.”
5. Considering transportation modal shifts.

◎ **Promoting eco-friendly packaging (Reducing the use of packing and packaging materials and other measures)**

1. Reduce
 - Reducing the use of cardboards, realizing simplified packing and packaging.
2. Reuse
 - Returnable and reusable containers for transporting and exporting products.
3. Recycle
 - Recycling plastic containers, trays, palettes, PP binding bands, film, and vinyl.

Examples of Eco-friendly Packaging

◎ **Recycling plastic containers**

For the shipment of NSK products we are replacing cardboard with reusable plastic containers. However, after prolonged use, plastic containers become deformed and damaged, or they may become unfit for use due to changes made in the dimensions of our products. In the past, it was common practice to dispose of plastic containers by burning them as fuel.

NSK now collaborates with manufacturers by taking the unusable containers and pulverizing them into a raw material that can be recycled to produce new plastic containers. Conventionally, only gray-

colored plastic containers and resin trays had been processed, but with the application of a coloring process we have now succeeded in recycling containers of different colors. This has enabled us to recycle approximately 50,000 plastic containers.



Recycled plastic containers

◎ **Returnable packing materials**

In our efforts to cut down on packing materials for export, we have been successful in introducing returnable packing materials for Electric Power Steering delivered to Europe. Previously, the one-way wooden palettes and tri-wall packing that were used, were discarded as waste after arrival. By using resin palettes and trays that can be stacked for return, we

have developed repeated-use, returnable packing. Packing materials have been greatly reduced from 900 tons to 10 tons per year.

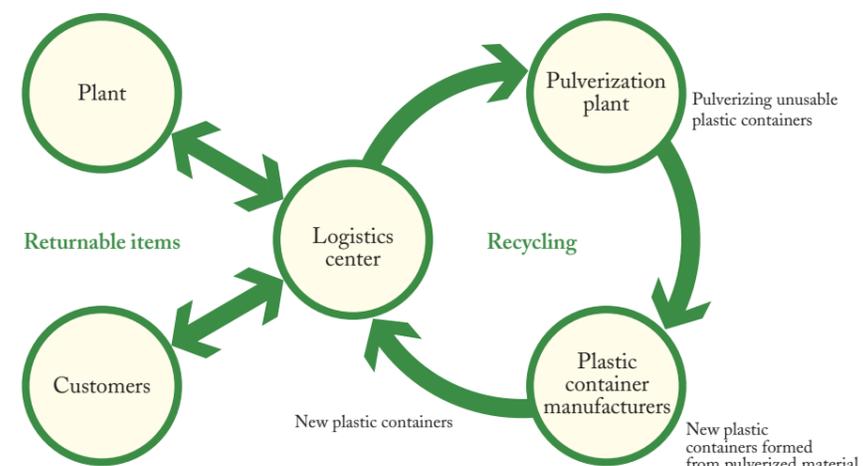


Before: one-way wooden palettes and tri-wall packing



After: returnable resin palettes and trays

Outline of plastic container recycling



Recyclable materials: plastic containers (various colors), other plastic products (resin trays etc.).

Green Procurement

NSK has been actively implementing the control of hazardous chemical substances based on voluntary standards and promoting green purchasing of paper, office equipment, and vehicles. To make a valuable contribution to the creation of a recycling-oriented society, we must assess the environmental impact of the products we procure, work harder towards reduction, and go beyond our corporate operations to encourage suppliers to take environmental action. To that end, we have launched a variety of new activities.

Policies for Activities

1. Reducing the environmental impact of raw materials, parts, and material resources.
2. Promoting controls for hazardous chemical substances.
3. Encouraging suppliers to implement voluntary environmental measures.
4. Reducing the environmental impact of general purchases.

To achieve these policies, we have developed new Green Procurement Standards and Green Purchasing Guidelines, and have begun implementation.

Green Purchasing of Raw Materials, Parts, and Material Resources

Publicly disclosing issues surrounding energy and resource conservation and hazardous chemical substances is one of

the ways we diminish the environmental impact of raw materials and parts used in our products and materials used in our production processes. Valuable information provided by our suppliers helps us to gain new insight into implementing internal control.

We have drawn up our Green Procurement Standards, and put them into practice to encourage our suppliers to take voluntary steps toward improvement. We will provide an assessment of the measures they have taken and urge them to develop an awareness of the critical importance of responding to environmental problems.

environmental responsibility.

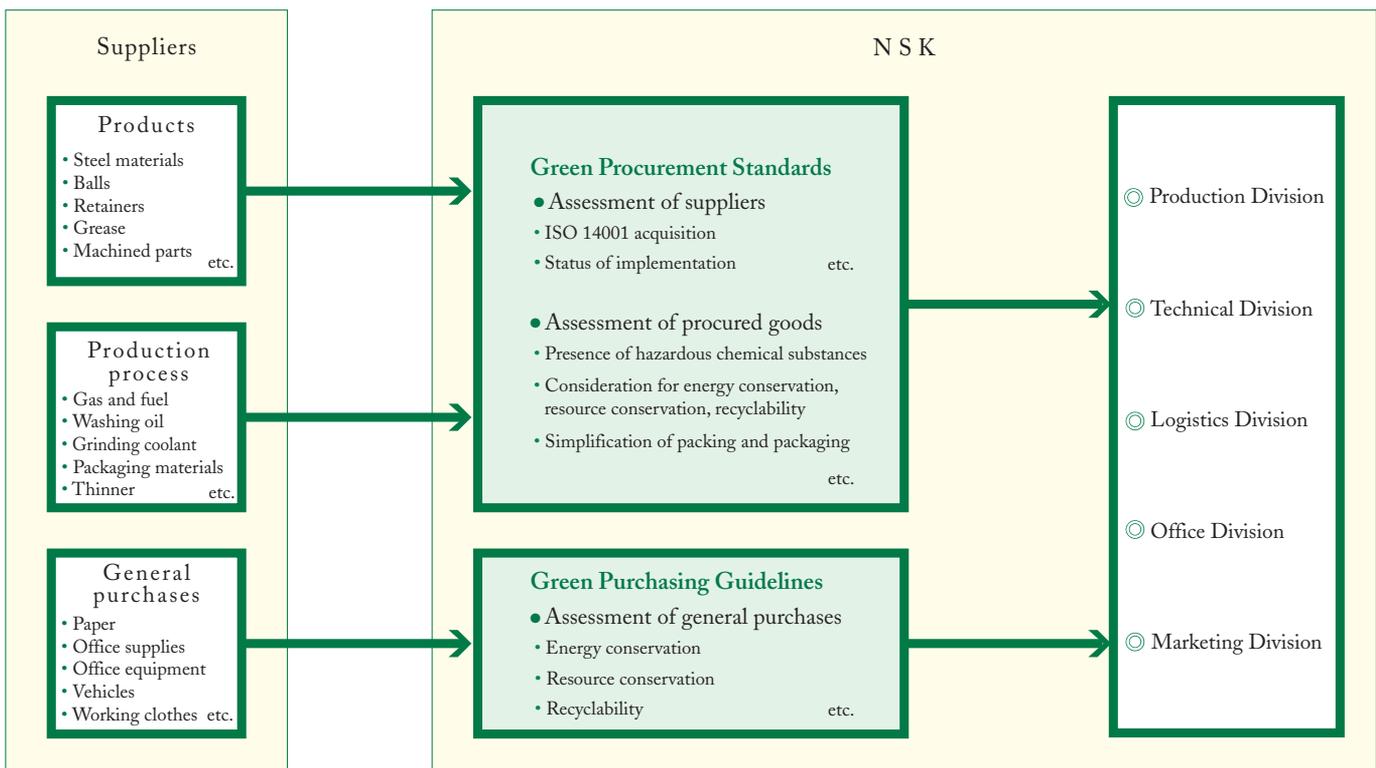
In order to travel further down that road and build a recycling-oriented society in the future, we decided it was necessary to expand green procurement policies across the Group, for a wider selection of purchased goods, which led to the creation of our Green Purchasing Guidelines.

The Guidelines are a list of factors to be considered when selecting goods and is already being used by the purchasing divisions.

Green Purchasing of General Goods

Individual assessments of energy conservation, the use of recycled materials, and the promotion of the green purchasing of paper, office equipment, and vehicles have been the initial steps on the road to

System for Green Procurement



Initiatives Taken at Each Plant and Group Company

After studying the environmental impacts of our plants' production, we created an Environmental Management Committee at each site. Promoting energy conservation and control of waste as well as hazardous chemical substances, we are also actively involved in contributing to local communities. At NSK Group companies, 10 affiliated companies in which NSK holds more than a 50% share, have environment liaison meetings where they exchange information on conservation as well as environmental policies. All affiliates carry out voluntary action plans with the same focus and determination as that of our own plants.

Initiatives taken at each plant

Fukushima Plant



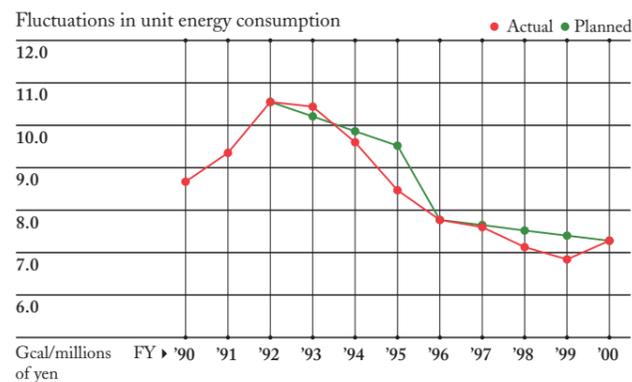
Water Quality

Item	Regulatory requirements	Actual value	
		Max.	Ave.
pH	5.8-8.6	8.9*	7.53
BOD (mg/l)	20.0	13.0	7.3
COD (mg/l)	-	-	-
Suspended solids (mg/l)	50.0	9.0	5.8
Oils (mg/l)	5.0	1.0	Less than 1
Nitrogen (mg/l)	60.0	5.5	4.5
Phosphorus (mg/l)	8.0	0.64	0.44

● Discharge point: River
 * Exceeded regulatory requirements because of photosynthesis by algae (light shielding countermeasures are being instituted to restrain photosynthesis).

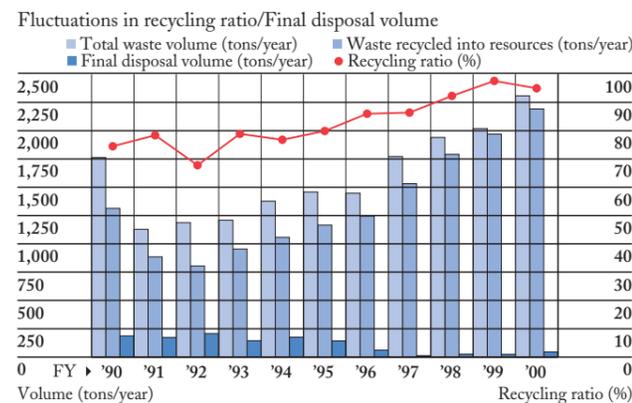
Air Quality

Item	Machinery	Fuel	Regulatory requirements	Actual value
NOx (ppm)	Boiler	Low sulfur heavy oil	180	72
Soot and dust (g/m ³ N)	Boiler	Low sulfur heavy oil	0.3	Less than 0.008
SOx (m ³ N/hr)	Boiler	Low sulfur heavy oil	17.5	0.68



Substances regulated by PRTR

Substance code	CAS code	Substance name	Volume treated (tons)
63	1330-20-7	xylene	4.9
227	108-88-3	toluene	6.4



Outline

Location	180-1, Nikaki, Tsutsumi, Tanagura-machi, Higashishirakawa-gun, Fukushima
Site Area	193,313 m ²
Number of Employees	595 (as of March 31, 2001)
Products	Small sized and miniature bearings
Acquisition of ISO 14001 Certification	July 1998

Status of Environmental Actions

◎ Environmental Management System

• In 1998, the Fukushima plant became the first Japanese site in the NSK Group to acquire ISO 14001 certification. It has been the model plant for the establishment of the Environmental Management System.

◎ Energy Conservation

• Unit energy consumption has been reduced as planned, due to energy-saving initiatives.
 • In FY2000, the plant's dedication to energy-saving activities were recognized and rewarded with the Excellent Energy Control Plant Award by the Director-General of the Agency of Natural Resources and Energy.

◎ Waste

• Due to the plant's expansion and the transference of additional equipment from other sites, the total volume of waste increased, however, this also led to a rise in the recycling ratio. In FY2000, the recycling ratio decreased to 95%, however, the plant is aggressively promoting environmental protection activities and is aiming towards zero emissions.

◎ Others

• In order to prevent leakage, the underground tank has been set in a basement structure.
 • In FY1998, a technological problem was overcome, and the use of chlorinated organic solvents for super-precision cleaning, was completely abolished.

Initiatives taken at each plant

Maebashi Plant



Water Quality

Item	Regulatory requirements	Actual value	
		Max.	Ave.
pH	5.8-8.6	7.7	7.6
BOD (mg/l)	25.0	22.0	7.8
COD (mg/l)	25.0	17.0	8.0
Suspended solids (mg/l)	50.0	6.0	2.7
Oils (mg/l)	5.0	Less than 1	Less than 1
Nitrogen (mg/l)	120.0	2.8	2.75
Phosphorus (mg/l)	16.0	0.34	0.24

● Discharge point: River

Air Quality

Item	Machinery	Fuel	Regulatory requirements	Actual value
NOx (ppm)	Boiler	Kerosene	180	110
	Heating furnace	Kerosene	200	77
Soot and dust (g/m ³ N)	Boiler	Kerosene	0.3	Less than 0.008
	Heating furnace	Kerosene	0.25	Less than 0.011
SOx (m ³ N/hr)	Boiler	Kerosene	0.9	Less than 0.02
	Heating furnace	Kerosene	0.5	Less than 0.02

Outline

Location	78 Toba-cho, Maebashi-shi, Gunma
Site Area	94,500 m ²
Number of Employees	1,096 (as of March 31, 2001)
Products	Precision machinery and parts
Acquisition of ISO 14001 Certification	December 1999

Status of Environmental Actions

◎ Environmental Management System

• Previously, this was the integrated site of the Maebashi plant and the Soja plant. In 1999, it became a separate organization and acquired ISO 14001 certification individually.

◎ Energy Conservation

• The result for unit energy consumption was the combined total of the Maebashi plant and the Soja plant. However, from FY2001, the data is to be calculated and managed separately.
 • After making an upward revision in FY1996, unit energy consumption fell below the set target. However, since FY1999, improvements as a result of continuing energy-saving activities have been clearly visible.
 • The plant remains committed to achieving targets by improving unit energy consumption during the heat treatment process.

◎ Waste

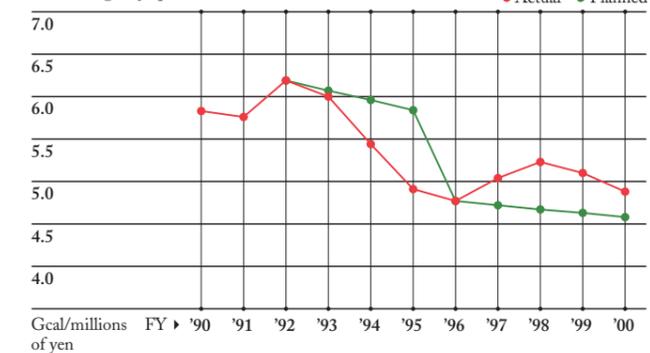
• Emulsion wastes from the nearby Soja and Akagi plants are treated together at this site in order to reduce environmental hazards and to increase efficiency. This year, to further advance treatment efficiency, the plant is switching to an evaporating concentrator.

• To enhance the internal environment of the plant, improvements were made in the storage area for metal scrap in order to gather them for thorough separation and recycling.

◎ Others

• To protect air quality, a conversion has been made from heavy oil to kerosene at an early phase in operations. The density of soot at this site is far below the emission standard.

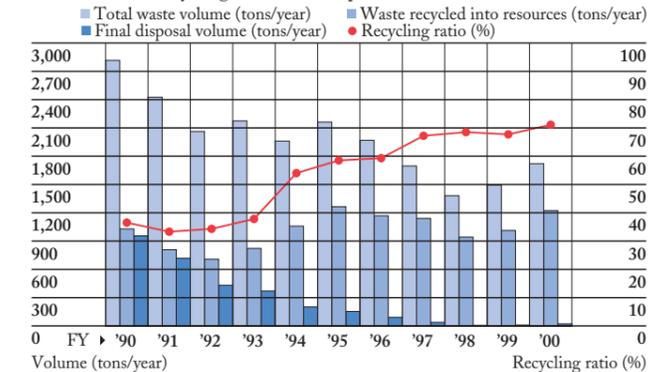
Fluctuations in unit energy consumption (including Soja plant)



Substances regulated by PRTR

Substance code	CAS code	Substance name	Volume treated (tons)
63	1330-20-7	xylene	5.7
227	108-88-3	toluene	1.3
304	None	boron and its compounds	3.5

Fluctuations in recycling ratio/Final disposal volume



Initiatives taken at each plant

Soja Plant



Outline

	Soja plant	Akagi branch plant
Location	1-8-1 Soja-machi, Maebashi-shi, Gunma	1240-1, Iidoi-machi Maebashi-shi, Gunma
Site Area	73,381 m ²	86,517 m ²
Number of Employees	876 (as of March 31, 2001)	200 (as of March 31, 2001)
Products	Automotive parts	Automotive parts; Precision machinery and parts
Acquisition of ISO 14001 Certification	December 1999	December 1999 (Acquired by Soja plant)

Status of Environmental Actions

Environmental Management System

- The Soja and Maebashi plants were previously integrated, however, the Soja plant (including the Akagi branch plant) became a separate organization in 1999 and acquired its own ISO 14001 certification.

Energy Conservation

- Before FY2001, unit energy consumption for this site was included in the figures for the Maebashi plant. Beginning in FY2001, it will be calculated separately for each site.

Waste

- At the Soja plant, measures were taken towards resource conservation, such as increasing the yield of the punching press and introducing a cold forging facility.
- The Akagi branch plant has been active in environmental protection by making returnable export packing materials, which is an effective use of resources and significantly lowers the volume of waste at the customer's end. Further, they have shown their dedication to separating waste and recycling by creating an area for collecting scrap metal.

Others

- The Soja plant is located in an area rich in water and greenery, near Mt. Akagi and the Tone River. Efforts have been made to landscape the site to match the surrounding countryside.

Water Quality

Plant	Item	Regulatory requirements	Actual value	
			Max.	Ave.
Soja	pH	5.8-8.6	8.2	7.6
	BOD (mg/l)	25.0	13.0	4.8
	COD (mg/l)	25.0	19.0	6.8
	Suspended solids (mg/l)	50.0	29.0	Less than 6.8
	Oils (mg/l)	5.0	Less than 1	Less than 1
	Nitrogen (mg/l)	120.0	4.2	3.5
	Phosphorus (mg/l)	16.0	0.27	0.2
Akagi	pH	5.8-8.6	7.1	6.8
	BOD (mg/l)	25.0	6.0	Less than 3.3
	COD (mg/l)	25.0	21.0	16.3
	Suspended solids (mg/l)	30.0	9.0	Less than 4.8
	Oils (mg/l)	5.0	2.0	1.7
	Nitrogen (mg/l)	120.0	19.0	13.6
	Phosphorus (mg/l)	16.0	1.9	1.3

• Discharge point: River

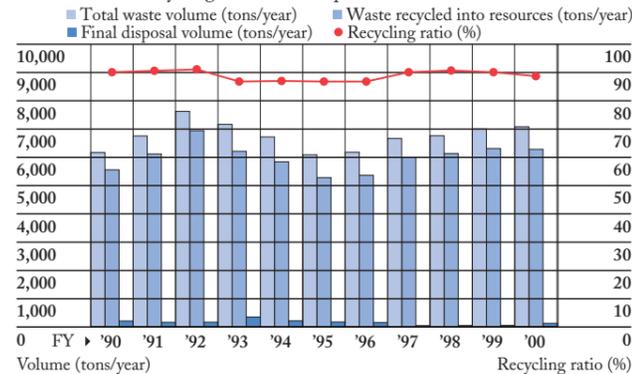
Air Quality

Plant	Item	Machinery	Fuel	Regulatory requirements	Actual value
Soja	NOx (ppm)	Boiler	Kerosene	180	100
	Soot and dust (g/m ³ N)	Boiler	Kerosene	0.3	Less than 0.01
	SOx (m ³ N/hr)	Boiler	Kerosene	0.8	Less than 0.02
Akagi	NOx (ppm)	Boiler	Kerosene	180	97
	Soot and dust (g/m ³ N)	Boiler	Kerosene	0.3	Less than 0.009
	SOx (m ³ N/hr)	Boiler	Kerosene	0.9	Less than 0.02

Substances regulated by PRTR

Plant	Substance code	CAS code	Substance name	Volume treated (tons)
Soja	63	1330-20-7	xylene	3.9
	227	108-88-3	toluene	11.6
Akagi	63	1330-20-7	xylene	1.9

Fluctuations in recycling ratio/Final disposal volume



Initiatives taken at each plant

Saitama Plant



Outline

Location	1-1 Onuma, Hanyu-shi, Saitama
Site Area	280,627 m ²
Number of Employees	599 (as of March 31, 2001)
Products	Automotive bearings; CVT; Precision machinery and parts
Acquisition of ISO 14001 Certification	September 1998

Status of Environmental Actions

Environmental Management System

- The Saitama plant, including the Saitama Precision Machinery and Parts plant, has acquired ISO 14001 certification.

Energy Conservation

- As a result of its aggressive energy conservation activities, the Saitama plant has significantly reduced its unit energy consumption. The figures for the year FY2000 greatly exceeded the target, thereby it became a model plant.

Waste

- The Saitama plant has been active in waste recycling for many years. In FY1994, it greatly reduced the final disposal volume by totally recycling grinding swarf.
- The Saitama plant has achieved 100% recycling of scrapped grinding stones and has been working to reduce the runoff, particularly grinding coolant, by doing on-site reprocessing. Consequently, the recycling ratio for FY2000 was 94% and the final disposal volume was small. Zero emissions are almost within reach.

Others

- Leakage walls have been installed around underground tanks that are buried in soft ground, and pipes that would normally be buried underground are now being suspended above ground.
- In order to clarify where hazardous chemical substances are used as well as to increase awareness of environmental issues, a "Hazard Map for Chemical Substances" has been created.
- By participating in clean-up activities in the surrounding area, the Saitama plant has also contributed to the protection of the local environment.

Water Quality

Item	Regulatory requirements	Actual value	
		Max.	Ave.
pH	5.8-8.6	8.7*	7.3
BOD (mg/l)	25.0	21.0	7.5
COD (kg/day)	5.1	4.7	2.5
Suspended solids (mg/l)	50.0	27.0	7.4
Oils (mg/l)	5.0	2.5	0.9
Nitrogen (mg/l)	60.0	15.0	8.1
Phosphorus (mg/l)	8.0	0.6	0.3

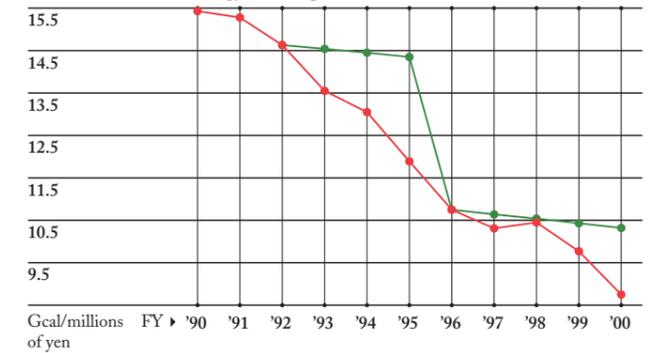
• Discharge point: River

* Exceeded regulatory requirements because of photosynthesis by algae (an aerator was installed in the water collection reservoir in order to prevent photosynthesis).

Air Quality

Item	Machinery	Fuel	Regulatory requirements	Actual value
NOx (ppm)	Boiler	LPG	150	130
	Heating furnace	Kerosene	180	71
Soot and dust (g/m ³ N)	Boiler	Kerosene	0.3	0.003
	Heating furnace	Kerosene	0.25	Less than 0.002
SOx (m ³ N/hr)	Boiler	Kerosene	1.42	0.049
	Heating furnace	Kerosene	1.53	Less than 0.026

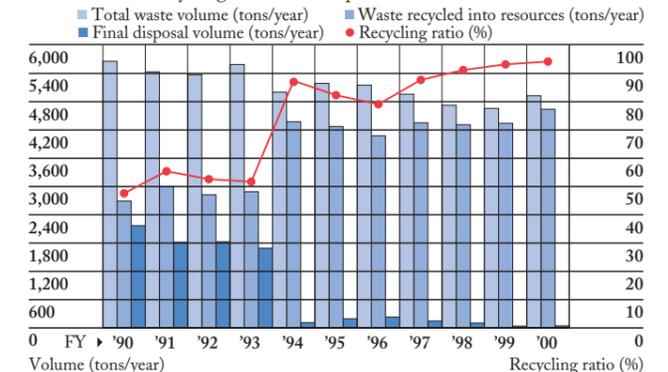
Fluctuations in unit energy consumption



Substances regulated by PRTR

Substance code	CAS code	Substance name	Volume treated (tons)
16	141-43-5	2-aminoethanol	4.7
24	None	n-alkylbenzenesulfonic acid and its salts	1.2
63	1330-20-7	xylene	11.0
227	108-88-3	toluene	3.0

Fluctuations in recycling ratio/Final disposal volume



Initiatives taken at each plant

Fujisawa Plant/Fujisawa Technology Department



Water Quality

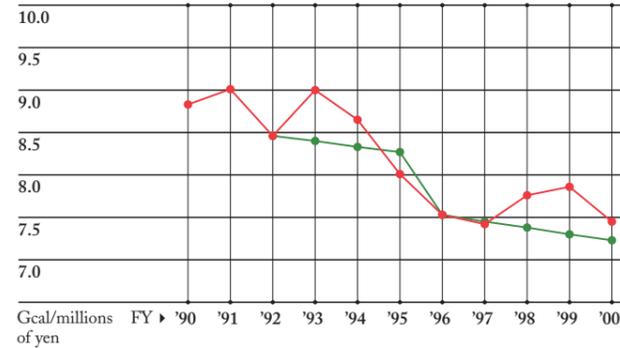
Item	Regulatory requirements	Actual value	
		Max.	Ave.
pH	5.0-9.0	7.8	7.1
BOD (mg/l)	600.0	60.0	28.3

• Discharge point: Sewage treatment plant (rivers unavailable)

Air Quality

Item	Machinery	Fuel	Regulatory requirements	Actual value
NOx (ppm)	Boiler	LPG	150	99
	Heating furnace	LPG/Kerosene	200	107
Soot and dust (g/m³N)	Boiler	Kerosene	0.3	Less than 0.001
	Heating furnace	LPG/Kerosene	0.25	0.04
SOx (m³N/hr)	Boiler	Kerosene	3.37	Less than 0.02
	Heating furnace	LPG/Kerosene	1.24	Less than 0.02

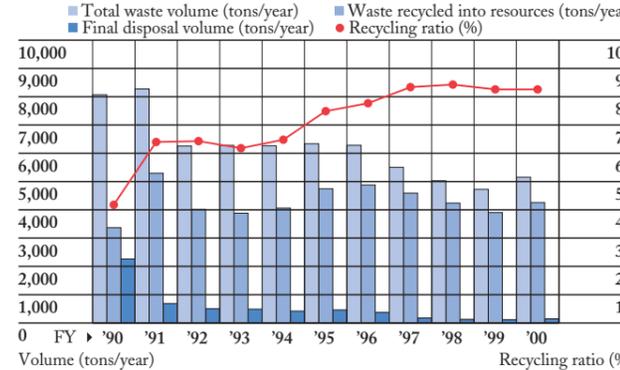
Fluctuations in unit energy consumption



Substances regulated by PRTR

Substance code	CAS code	Substance name	Volume treated (tons)
16	141-43-5	2-aminoethanol	1.9
63	1330-20-7	xylene	39.1
224	108-67-8	1,3,5 trimethylbenzene	1.3
309	9016-4-9	poly(oxyethylene) = nonylphenyl ether	1.1

Fluctuations in recycling ratio/Final disposal volume



Outline

Location	1-5-50 Kugenuma Shinmei, Fujisawa-shi, Kanagawa
Site Area	163,851 m²
Number of Employees	1,516 (as of March 31, 2001)
Products	Large-sized ball bearings; Roller bearings
Acquisition of ISO 14001 Certification	September 1999

Status of Environmental Actions

◎ Environmental Management System

- The Technology Department, the hub of the company is located at this site, that has acquired ISO 14001 certification which also covers manufacture, design, and development.

◎ Energy Conservation

- Due to an upward revision in FY1996, unit energy consumption results have been below target since FY1998. However, by aggressively conducting energy conservation activities, the results for FY2000 have improved compared to those of FY1999.

◎ Waste

- The Fujisawa plant has been working to reduce waste and its negative impact on the environment through in-house reprocessing of grinding coolant and the total recycling of scrapped grinding wheels.

◎ Others

- As more urbanization occurs, the Fujisawa plant has increased greenery within the site and is using cleaner fuel.
- The Product Development Division is located at this site, so the plant has enforced strict control over the usage of hazardous chemical substances.
- In compliance with the Kanagawa Automobile Control System, environmental measures have been carried out in the logistics section.
- The plant has been involved in environmental management education by creating a basic textbook every year and by training employees from each section.

Initiatives taken at each plant

Kirihara Precision Machinery and Parts Plant/NSK Autoliv Co., Ltd.

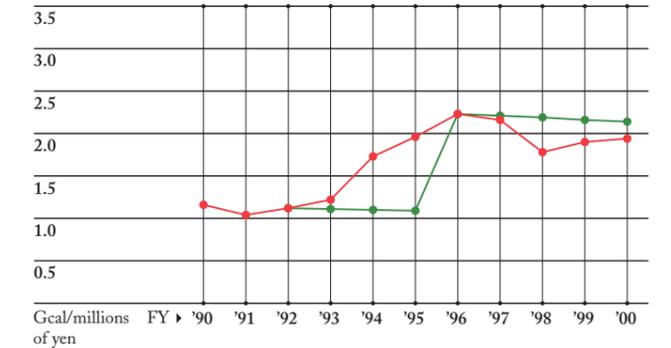


Water Quality

Item	Regulatory requirements	Actual value	
		Max.	Ave.
pH	5.8-8.6	8.0	7.9
BOD (mg/l)	60.0	12.0	3.2
COD (mg/l)	60.0	11.0	5.0
Suspended solids (mg/l)	90.0	13.0	Less than 3.4
Oils (mg/l)	5.0	Less than 1	Less than 1

• Discharge point: River

Fluctuations in unit energy consumption



Outline

Location	12 Kirihara-cho, Fujisawa-shi, Kanagawa
Site Area	44,044 m²
Number of Employees	391 (as of March 31, 2001)
Products	Mechatronics products; Precision machinery and parts (Kirihara Precision Machinery and Parts plant); Seatbelts (NSK Autoliv)
Acquisition of ISO 14001 Certification	November 1999

Status of Environmental Actions

◎ Environmental Management System

- The plant initially acquired ISO 14001 certification as NSK Autoliv Co., Ltd. When the Precision Machinery and Parts plant was transferred to this site, both became involved in the development of the Environmental Management System.

◎ Energy Conservation

- Due to the recent transfer of machinery from other plants, unit energy consumption has increased slightly, but the end results have still exceeded the targets.
- During the extension, energy conservation and anti-global warming measures were considered. Energy conserving machinery was installed; a gas-heat-pump-package air conditioner for the use of cleaner energy, and an inverter compressor, etc.
- With assembly as the main manufacturing process, the plant does not have heat treatment facilities, therefore, energy consumption at this site is less than other sites and is more environmentally friendly.

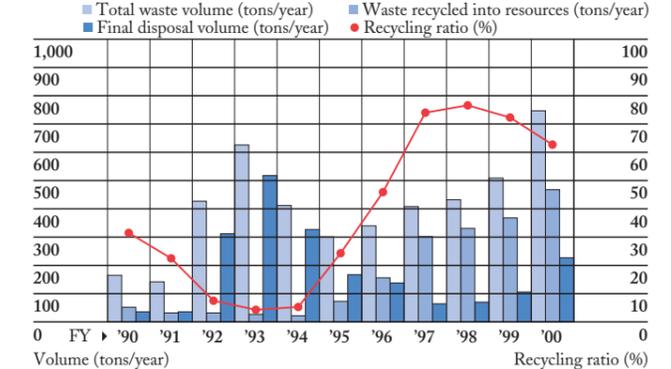
◎ Waste

- Since 1995, the total waste volume has increased in line with the increase in seatbelt production. At the same time, efforts have been made to enhance the recycling ratio by reusing resources, such as, the raw materials used in shaft furnaces for waste plastic; and scrap metal combined with plastic. The recent transfer of the Precision Machinery and Parts plant has led to an increase in waste and a slight decline in the recycling ratio, but a firm commitment to improvement will be made.

◎ Others

- The main manufacturing process at this site is assembly and the amount of chemical substances used is small, consequently substances regulated by PRTR are not being used.

Fluctuations in recycling ratio/Final disposal volume



Note: Facilities not subject to air pollution restrictions. Substances regulated by PRTR not used

Shiga Manufacturing Division (Otsu Plant, Ishibe Plant)



Outline

	Otsu plant	Ishibe plant
Location	1-16-1 Seiran, Otsu-shi, Shiga	1-1-1 Ishibegaoka, Ishibe-cho, Kouga-gun, Shiga
Site Area	53,279 m ²	185,330 m ²
Number of Employees	545 (as of March 31, 2001)	830 (as of March 31, 2001)
Products	Ball bearings	Automotive bearings; Ball bearings
Acquisition of ISO 14001 Certification	November 1999	October 1998

Status of Environmental Actions

Environmental Management System

- Before the Otsu and Ishibe plants were integrated into the Shiga Manufacturing Division, each plant had individually acquired ISO 14001 certification. As a result of their integration, certification was combined in November 2000.

Energy Conservation

- While the unit energy consumption at the Otsu plant fell short of the target, the Ishibe plant improved performance for FY2000 over that of the previous fiscal year. It has met the target as a result of the development of energy-saving activities.
- The Ishibe plant uses environmentally friendly fuels for air conditioners and heat treatment facilities, protecting the earth from further global warming.

Waste

- With a recycling ratio as high as 96% in FY2000—the result of the in-house solidification of grinding swarf into briquets that contributed to the stabilization of recycling processes—the Otsu plant is a model plant among other factories. The plant is planning to achieve zero emissions in FY2003, and furthermore it will proactively promote initiatives.
- Ishibe plant has been actively promoting the recycling of plastic containers as an environmental logistics policy.

Others

- Located near Lake Biwa, the water source for the Kinki region, the Shiga Manufacturing Division enforces strict control over water quality.
- This site has been active in promoting environmental protection including issuing the first environmental report in NSK's history for each site.

Otsu Plant

Water Quality

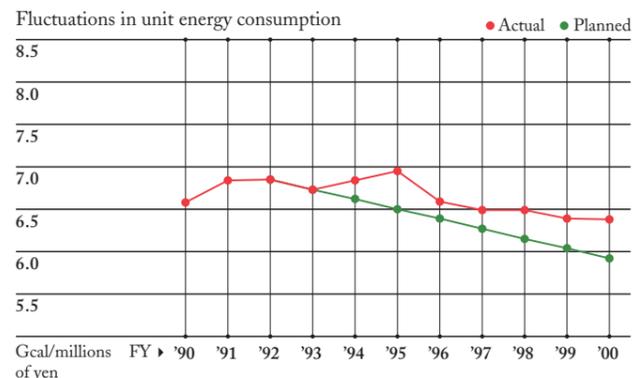
Item	Regulatory requirements	Actual value	
		Max.	Ave.
pH	6.0-8.5	8.1	7.4
BOD (mg/l)	70.0	26.0	5.8
COD (mg/l)	70.0	9.6	5.6
Suspended solids (mg/l)	90.0	29.0	5.1
Oils (mg/l)	5.0	2.6	0.9
Nitrogen (mg/l)	40.0	5.7	2.3
Phosphorus (mg/l)	2.0	1.2	0.6

- Discharge point: River

Air Quality

Item	Machinery	Fuel	Regulatory requirements	Actual value
NOx (ppm)	Boiler	LPG	150	100
Soot and dust (g/m ³ N)	Boiler	Kerosene	0.3	0.011
SOx (K value)	Boiler	Kerosene	8.76	Less than 0.01

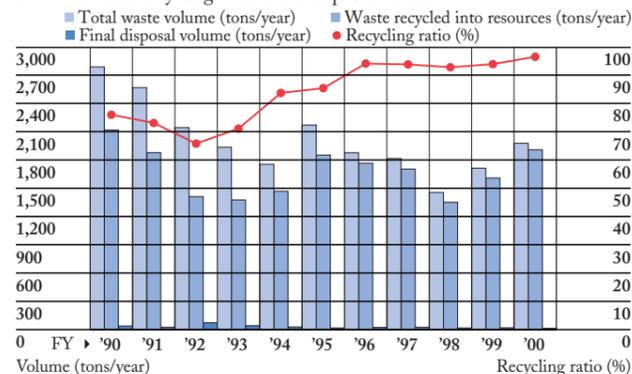
* K value: An index established by local ordinances for limiting the volume of SOx emissions.



Substances regulated by PRTR

Substance code	CAS code	Substance name	Volume treated (tons)
63	1330-20-7	xylene	5.0

Fluctuations in recycling ratio/Final disposal volume



Ishibe Plant

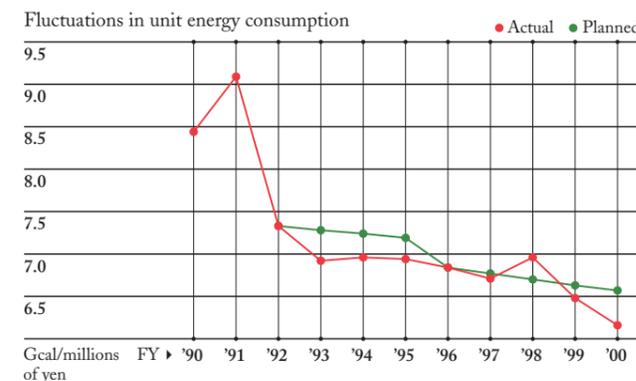
Water Quality

Item	Regulatory requirements	Actual value	
		Max.	Ave.
pH	6.0-8.5	8.4	7.6
BOD (mg/l)	70.0	19.1	8.0
COD (mg/l)	70.0	16.6	8.4
Suspended solids (mg/l)	90.0	71.8	11.8
Oils (mg/l)	5.0	3.2	1.4
Nitrogen (mg/l)	40.0	4.5	2.4
Phosphorus (mg/l)	2.0	0.1	0.1

- Discharge point: River

Air Quality

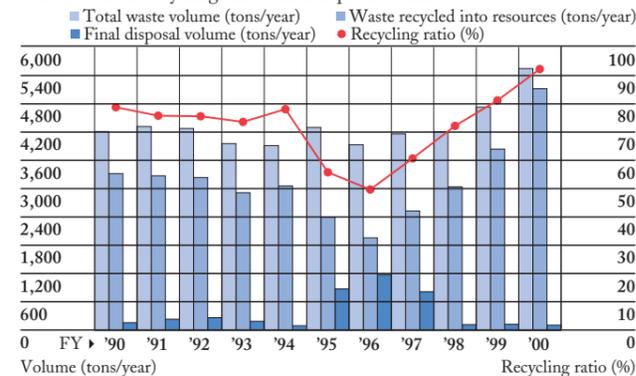
Item	Machinery	Fuel	Regulatory requirements	Actual value
NOx (ppm)	Boiler	Natural gas	150	78.6
Soot and dust (g/m ³ N)	Boiler	Natural gas	0.1	0.02
SOx (K value)	Boiler	Natural gas	8.76	Less than 0.1



Substances regulated by PRTR

Substance code	CAS code	Substance name	Volume treated (tons)
16	141-43-5	2-aminoethanol	2.7
63	1330-20-7	xylene	3.4
224	108-67-8	1,3,5-trimethylbenzene	1.4

Fluctuations in recycling ratio/Final disposal volume



Note: The increase in final disposal volume between 1995 and 1997 was caused at our consignees, where it was not possible to recycle a portion of the grinding swarf.

Definitions of Environmental Data for Each Plant

1. Glossary

pH

Hydrogen ion concentration

COD (Chemical Oxygen Demand)

Amount of oxygen in oxidant, consumed to oxidize pollutants in water.

BOD (Biochemical Oxygen Demand)

Amount of oxygen needed for microorganisms to decompose pollutants in water.

NOx

Nitrogen Oxide

SOx

Sulfur Oxide

LPG

Liquefied Petroleum Gas

2. Others

Air Quality

The actual value of NOx, soot and dust, and SOx indicates the maximum amount at the relevant facility.

Unit Energy Consumption

The energy consumption quantity per million yen of the added value output.

Energy conservation awards won by each plant

We have been engaged in efficient energy use mainly in the production departments since the 1960s. Our energy conservation activities have won the following awards.

Year	Award	Authority	Plant
1962	Excellent Energy Plant	Minister of International Trade & Industry (Electricity)	Fujisawa
1981	Excellent Energy Plant	Minister of International Trade & Industry (Heat)	Fujisawa
1982	Excellent Energy Plant	Minister of International Trade & Industry (Heat)	Maebashi
1983	Excellent Energy Plant	Minister of International Trade & Industry (Electricity)	Otsu
	Excellent Energy Plant	Minister of International Trade & Industry (Electricity)	Ishibe
1984	Excellent Energy Plant	Minister of International Trade & Industry (Electricity)	Saitama
1986	Excellent Energy Plant	Agency of Natural Resources and Energy (Electricity)	Ishibe
1987	Excellent Energy Plant	Agency of Natural Resources and Energy (Electricity)	Saitama
	Excellent Energy Plant	Minister of International Trade & Industry (Heat)	Fujisawa
1993	Excellent Energy Plant	Agency of Natural Resources and Energy (Electricity)	Fujisawa
1994	Energy Control Achiever	Minister of International Trade & Industry (Electricity)	Fujisawa
1997	Excellent Energy Plant	Minister of International Trade & Industry (Electricity)	Fukushima
	Excellent Energy Plant	Minister of International Trade & Industry (Electricity)	Saitama
1999	Energy Control Achiever	Minister of International Trade & Industry (Electricity)	Saitama
2000	Excellent Energy Plant	Agency of Natural Resources and Energy (Electricity)	Fukushima

Initiatives taken at affiliated companies

NSK Torrington Co., Ltd. (Haruna Plant)

Outline

Location	941-2 Nakagawa, Nakasatomi, Haruna-machi, Gunma-gun, Gunma
Business	Manufacture of needle bearings
Site Area	88,187 m ²
Number of Employees	356 (as of March 31, 2001)

Status of Environmental Actions

NSK Torrington was jointly established by NSK and The Torrington Co., Ltd. of the U.S. to produce needle bearings mainly for vehicles at the Takasaki and Haruna plants and Yahata branch plant. The Haruna plant was built as a new, environmentally friendly plant with state-of-the-art facilities. Situated in a beautiful location that is rich in nature, it is surrounded by the Jomo Sanzan (three famous mountains of the Jomo region) Mt. Akagi, Mt. Haruna, and Mt. Myogi. The company has established an Environmental Management System, acquired ISO 14001 certification in January 2001, and has been promoting environmental protection activities.

Haruna plant: Main Features of Facility

1. Reduction of Environmental Impact

- Use of city gas (natural gas)—use of cleaner energy.
- Centralized Energy Control System—efficient usage of energy.
- Prevention of noise caused by mechanical pressing machine—noise prevention by installation of sound insulator into the machine.

2. Anti-pollution and Emergency Measures

- Centralized Monitoring System—24-hour monitoring of the conditions of runoff, soot and dust, compressed air, kerosene, groundwater, tap water, and onsite power generation of electricity.
- Drainage Facility—advanced drainage facility adopting nitrogen treatment technology.
- Waste Storage Site—structure that prevents the leakage of substances such as waste oils.
- Hazardous Substances Storage Site—structure that prevents the leakage of substances such as grease.
- Drainage Conduit for Rainwater—logical structure and drainage routes.



Drainage facility

NSK-Warner Kabushiki Kaisha

Outline

Location	2345 Aino, Fukuroi-shi, Shizuoka
Business	Manufacture of one-way clutches and products related to friction materials
Site Area	136,430 m ²
Number of Employees	736 (as of March 31, 2001)

Status of Environmental Actions

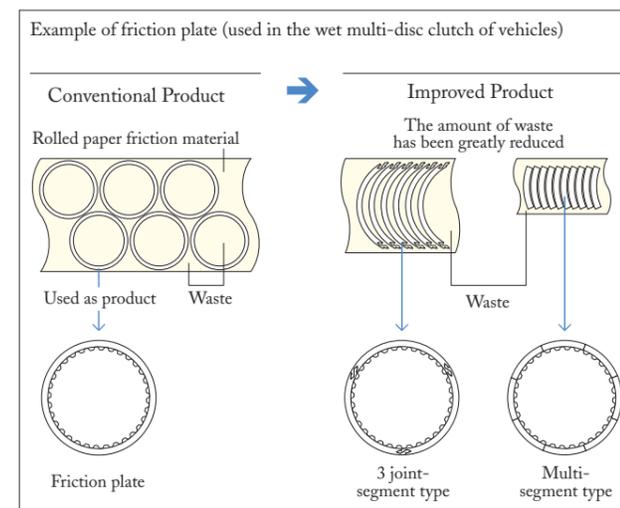
Founded as a joint venture between NSK and BorgWarner, Inc., NSK Warner Kabushiki Kaisha has been engaged in the production and development of one-way clutches and products related to friction materials. Situated in Fukuroi-shi, Shizuoka, and ringed by the Ogasayama Hills, the plant greatly benefits from its rich natural location.

Since the beginning of plant construction, the company has been aggressively involved in energy-saving activities, such as, controlling the number of air compressor units, promoting closed-loop control of cooling water; and introducing a centralized monitoring system, which automatically measures the usage volume of fuel, power, and water.

A large amount of paper friction materials are used in the manufacturing of friction material-related products, one of the plant's major products. In the past, only the ring-cut plate punched out from the rolled material was used as a product, resulting in a large volume of waste. Since then, the company has developed a new method to produce ringed plates, by jointing several strip-shaped parts and thus, improving the efficiency of material usage. By gradually extending the application of this new method, the company will make continuous efforts to dramatically reduce the volume of waste.

As proof of the company's active involvement in environmental protection, it acquired ISO 14001 certification in March 2001.

Measures to reduce friction material wastes



NSK Kyusyu Co., Ltd.

Outline

Location	774 Nissei, Furukawa, Ukiha-machi, Ukiha-gun, Fukuoka
Business	Manufacture of automotive parts (steering); Precision machinery and parts (ball screws); Bearings for special environments
Site Area	152,000 m ²
Number of Employees	267 (as of March 31, 2001)

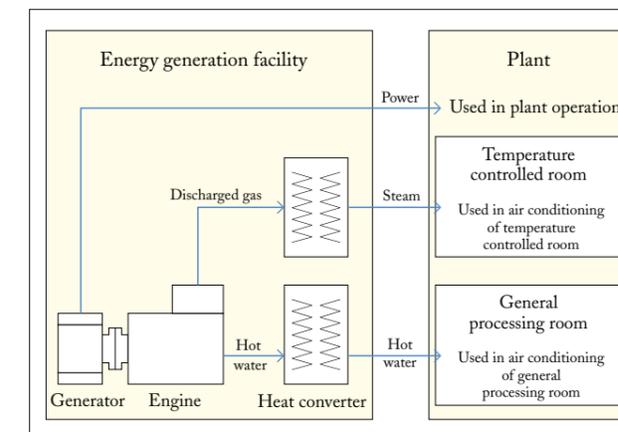
Status of Environmental Actions

NSK Kyusyu Co., Ltd. started operations as a subsidiary of NSK in 1996. The site is located in the non-restricted area of Yaba Hita Hikosan Quasi-National Park with Mt. Minou to its south and the Chikugo River to its north. It manufactures automotive and precision machinery and parts at this beautiful location, among rivers and mountains.

Since the launch of operations, the company has been highly conscious of environmental issues. Activities began toward the acquisition of ISO 14001 certification ahead of other sites, by the group's development of the Environmental Management System, and it was acquired in October 2000. By continually strengthening energy-saving and waste reduction measures, the plant proves its commitment to environmental conservation.

In April 2001, the plant began the manufacture of ball screws, and while undergoing expansions the site became the first in the NSK Group to introduce a co-generation system. By using discharged heat from the generator for air conditioning, the efficiency of fuel consumption has been improved, with the aim to decrease CO₂ emissions to approximately 1,000t – CO₂/year and to achieve energy savings of 3,000 Gcal/year.

Outline of Co-generation System



Inoue Jikuuke Kogyo Co., Ltd.

Outline

Location	1640-1 Sabi, Tondabayashi-shi, Osaka
Business	Manufacture and sales of ball bearings and related parts
Site Area	20,682 m ²
Number of Employees	246 (as of March 31, 2001)

Status of Environmental Actions

Established in 1944, the Inoue Jikuuke Tondabayashi plant is located near Kongo Ikoma Quasi-National Park, where mountains, water, and greenery are plentiful. The plant produces ball bearings that respond to industry's diverse needs. Due to its location, the plant is equipped with a highly advanced drainage facility. It is also actively engaged in the promotion of environmental conservation activities with the adoption of highly efficient transformers and a gas heating pump air-conditioning system.

Furthermore, an Environmental Management System has been built as a part of business activities, with the aim of harmonizing with the environment. ISO 14001 certification was acquired in February 2001.

NSK Micro Precision Co., Ltd.

Outline

Location	645 Miyamae, Fujisawa-shi, Kanagawa
Business	Manufacture and sales of miniature bearings and unit products
Site Area	5,619 m ²
Number of Employees	294 (as of March 31, 2001)

Status of Environmental Actions

Established in 1949, the plant is located in the natural surroundings of the Shonan region, with Enoshima to its south and Mt. Fuji to its west. NSK Micro Precision manufactures miniature bearings, which support the latest technology including that of the IT field, and unit products made with technology used in bearing production.

In addition to submicron levels of machining accuracy, high cleanliness is required in production. Although it is a difficult problem to tackle, the company has actively been working to decrease the environmental impact of chemical cleaners, by introducing a new cleaning technology.

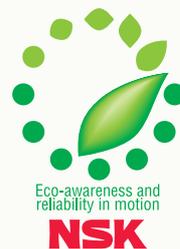
ISO 14001 certification was acquired in June 2001. NSK Micro Precision will further promote environmental protection with more efficient energy usage and less waste production in the future.



For further information regarding this Environmental Report, please contact us at:

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URL: <http://www.nsk.com>



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