

# II

# For the Global Environment

**Balancing production and environmental conservation, we will handover the global environment in sound condition to the next generation.**

As a business dependent on forest resources, or a gift of nature, as its major raw material, we place the highest priority on conservation of the global environment. To realize sustainable development in harmony with the global environment, the Core Group Companies vigorously promote the recycling of wastepaper, prevention of global warming, reduction and recycling of waste generation, energy saving, resource saving, and the reduction of environmental impact caused by their business activities, while nurturing renewable forest resources ourselves.

## Recognition of Current Situation

All human beings share the challenge of conserving and maintaining the global environment in sound condition and promoting sustainable development. In February 2005, the Kyoto Protocol became effective, defining the targets for CO<sub>2</sub> reduction for developed nations. Businesses now undertake a more significant role in the achievement of the goals of the Protocol.

Among all, paper manufacturing is an industry that consumes a huge amount of resources in its production process, including water, fuel, and wood materials. Therefore, conservation of the global

environment, or the source of such resources, is the key issue that exerts enormous influence on the existence of the industry.

Under the recognition, each of the Core Group Companies has conducted environmental conservation activities that meet the characteristics of its business. For the purpose of fulfilling the Group's social responsibility, it is important to enhance environmental management and continue the improvement of environmental performance of the whole Group. Based on the environmental conservation activities that have been conducted by each mill and office, now is the time to build an organization or scheme that exercises control over the efforts of each company, pursuing more substantial results.



### Outline of FY 2004 and Policy

Based on the system established by each subordinate company, we are currently enhancing the environmental management of the whole Group. We are examining the plan to acquire blanket certification of ISO 14001 as a group by FY 2011. In preparation for that, subordinated companies, mills, and offices that have not yet acquired certification of an environmental management system are currently endeavoring to acquire ISO 14001 or other certification such as Eco-Action 21.

The Group is also reducing the environmental impact of its

products through their whole life cycle from selection of raw materials to production, distribution, and disposal after use. While investing in the equipment for environmental conservation, the Group promotes expansion of the use of wastepaper, reduction of CO<sub>2</sub> emissions from fossil fuels through the utilization of biomass fuel, and reduction of the use and emission of hazardous chemical substances. In FY 2004, one mill of Nippon Paper Industries Co., Ltd., started operation of a biomass power generation facility, and key manufacturing companies in the Pulp and Paper Business achieved the targets of reducing the final-disposal waste predetermined by each company. We will set higher targets and make efforts to reduce environmental impacts.

# Environmental Management

## Environmental charter

As paper manufacturing is largely dependent on nature, which nourishes wood, the raw material for paper, the Nippon Paper Group is always aware of the importance of being thoughtful of its impact on the environment from a long-term viewpoint.

Nippon Paper Industries Co., Ltd. and Daishowa Paper Manufacturing Co., Ltd., predecessors of the Nippon Paper Group, independently established the Charter on the Environment in 1993 and have been ecologically conscious in their business. When Nippon Unipac Holding (present Nippon Paper Group, Inc.) was founded, the Charter on the Environment by the Group was established. The Group's core production companies have established their own specific action guidelines in accordance with the Charter.

## Environmental management promotion scheme

Each subordinated company consisting of the Nippon Paper Group or its mills has been tackling construction of an environmental management system individually since before the business integration in March 2001.

Each mill of the major subordinated companies has its own environmental management system based on such standards as ISO 14001, and each company has an Environment Subcommittee to supervise the system. An example is Iwakuni Mill of Nippon Paper Industries. The Environment Management Committee and Environment Manager are responsible for operations, and the Technical Service & Environmental Control Department at the Mill exercise control over all administrative tasks.

Based on the organizations of each company, we endeavor to enhance the total environmental management system as a group.

## The Charter on the Environment

(established on March 30, 2001)

### Philosophy

Nippon Paper Group regards the coexistence with the natural environment as the basis for their sustainable corporate activities. Based on this recognition, the group will strive to achieve a recycle-based society and to protect the natural environment on a global scale over the long term.

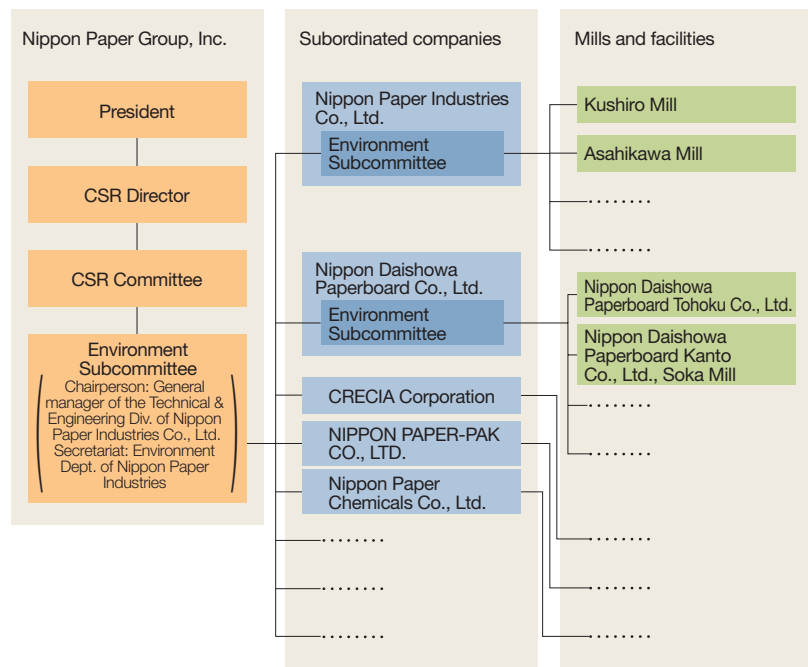
### Basic Policy

- 1. Forest Resource Protection**  
The group shall promote tree-farm operations for securing sustainable resources basis and utilize wood resources efficiently.
- 2. Efficient Use of Resources**  
The group shall promote energy savings, utilization of wastepaper, and recycling of containers and packaging.
- 3. Reduction of Environmental Impact**  
The group shall enhance the management of substances that may impact on the environment and promote to reduce the usage of such substances, as well as the enhancement of the reduction of wastes.
- 4. Consistency of Technological Development and Environmental Protection**  
The group shall engage in the R&D of new products and manufacturing technology which is in consistent with environmental protection.
- 5. Advanced Disclosure of Environmental Information**  
The group shall actively disclose environmental information and promote internal & external communication.

### Action Guidelines

Each group company shall establish its own specific action guidelines that are in compliance with the basic philosophy and policy.

## Environmental management promotion scheme



\* The Environment Subcommittee of Nippon Paper Group, Inc. also undertakes the role of the Environment Subcommittee of Nippon Paper Industries.

## The present situation of construction and implementation of environmental management systems

Nippon Paper Group, Inc., has an Environment Subcommittee under the CSR Committee that was established in October 2003. The Environment Subcommittee discusses a variety of environmental management issues of the whole Group, including policy formulation and object setting for environmental conservation activities. The general manager of the Technical & Engineering Division of Nippon Paper Industries, Co., Ltd. is appointed as chairperson of the subcommittee and the Environment Department of the same company assumes the role of secretariat.

The agenda discussed and resolved by the Environment Subcommittee of Nippon Paper Group, Inc., shall be communicated to the Environment Subcommittee of each subordinated company, which discusses the issues regarding the environmental management of the company based on the resolution and promotes its own environmental conservation activities.

## Promoting acquisition of certification for environmental management systems

The Nippon Paper Group promotes acquisition of ISO 14001 certification, an international standard for environmental management systems. In FY 2004, five sites acquired the certification. The operating companies listed on the right have acquired certification as of October 2005.

## Strengthening the environmental management of the whole Group

To further strengthen environmental management as a group, the Nippon Paper Group plans to acquire blanket certification of ISO 14001 by FY 2011. As an effort toward acquisition, the Group's mill and offices that have not acquired ISO 14001 certification set a target of acquiring the certification or introducing one of the simplified environmental management systems like Eco-Action

21\* by the end of FY 2008. All mills and offices of Nippon Paper Industries Co., Ltd., also aim at acquiring the blanket certification.

\*Eco-Action 21 is a guideline laid down by the Ministry of the Environment as a method to encourage a range of small- to medium-sized corporations, schools, and public institutions to establish, operate, and maintain a system for effective and efficient implementation of environmental efforts; set and implement environmental objectives; and summarize, evaluate, and report their results. Certification and registration systems based on this guideline are provided for businesses.

### Acquisition of ISO 14001 certification

Company name	Mills, office or production subsidiaries <sup>*1</sup>	Date acquired
Nippon Paper Industries Co., Ltd.	Kushiro	27 Aug. 1999
	Asahikawa	10 Dec. 2004
	Yufutsu	20 Nov. 1998
	Shiraoi	25 Jan. 2002
	Ishinomaki	12 Nov. 1999
	Iwanuma	27 Aug. 1999
	Nakoso	5 Nov. 1999
	Suzukawa	8 Sep. 2000
	Fuji	20 Dec. 2001
	Fushiki	5 Feb. 1999
	Iwakuni	5 Nov. 1999
	Komatsushima	30 Sep. 1999
	Yatsushiro	24 Dec. 1999
	Research & Development Div.	14 Sep. 2001
Nippon Daishowa Paperboard Co., Ltd.	Nippon Daishowa Paperboard Tohoku Co., Ltd.	17 Dec. 1999
	Nippon Daishowa Paperboard Kanto Co., Ltd. (Soka Mill)	3 Dec. 1999
	Nippon Daishowa Paperboard Kanto Co., Ltd. (Ashikaga Mill)	27 Oct. 2000
	Nippon Daishowa Paperboard Yoshinaga Co., Ltd.	7 Dec. 2001
	Nippon Daishowa Paperboard Nishinippon Co., Ltd. (Geibo Mill)	1 Dec. 2000
	Nippon Daishowa Paperboard Nishinippon Co., Ltd. (Kochi Mill)	25 Jun. 1999
CRECIA Corporation	Tokyo	8 Feb. 2002
	Kaisei	19 Sep. 2003
	Kyoto	19 Dec. 2003
	Iwakuni	14 Feb. 2003
KOYO PAPER MFG. CO., LTD.	Headquarters Mill	22 Feb. 2001
Kitakami Paper Co., Ltd.	Headquarters Mill	12 Mar. 2004
SAN-MIC SHOUJI CO., LTD.	Whole company	19 Oct. 2001
NIPPON PAPER-PAK CO., LTD.	Headquarters and Liquid Packaging Center	4 Aug. 2000
	SOKA PAPER-PAK CO., LTD.	28 Dec. 2000
	EGAWA PAPER-PAK CO., LTD.	28 Dec. 1999
	MIKI PAPER-PAK CO., LTD.	22 Dec. 2000
	ISHIOKA KAKO CO., LTD.	27 Apr. 2001
	Gotsu	22 Oct. 1999
Nippon Paper Chemicals Co., Ltd.	Iwakuni	Incorporated into the system of Iwakuni Mill of Nippon Paper Industries Co., Ltd.
	Higashimatsuyama	12 Mar. 1999
	Yufutsu	Incorporated into the system of Yufutsu Mill of Nippon Paper Industries Co., Ltd.
	Komatsushima	Incorporated into the system of Komatsushima Mill of Nippon Paper Industries Co., Ltd.
	Headquarters and Miyagi Mill ◆	17 Mar. 2005
Daishowa Uniboard Co., Ltd.	Headquarters and Miyagi Mill ◆	17 Mar. 2005
SHIKOKU COCA-COLA BOTTLING CO., LTD.	Headquarters and Komatsu Mill	25 Nov. 2000
Nippon Paper Lumber Co., Ltd.	Insulator Sales Dept. ◆	25 Mar. 2005
Nippon Paper Development Co., Ltd.	Headquarters+two divisions <sup>*2</sup>	5 Jul. 2002
Sakurai Co., Ltd.	Headquarters	29 Jan. 2003
South East Fibre Export Pty. Ltd.	Whole company (Headquarters, mills, forest land business and others) ◆	19 Aug. 2004
Nippon Paper Treefarm Australia Pty. Ltd.	Portland Treefarm Project ◆	8 Feb. 2005
	Bunbury Treefarm Project ◆	30 Mar. 2005
	Victoria Treefarm Project	11 Mar. 2004

\*1 Mills, offices or production subsidiaries with ◆ acquired the certificate in FY 2004.

\*2 Two divisions denote Landscape Department and Tokyo Sports and Amusement Department.

# Environmental Management

## Environmental audit

The Core Group Companies regularly conduct two types of environmental audits: a system audit and a performance audit.

A system audit means an environmental audit based on ISO 14001 standards (ISO audit), and it audits the status of implementation of the environmental management system. Internal environmental auditors of each company conduct an internal environmental audit, and external auditing organizations provide an external environmental audit.

On the other hand, a performance audit is an in-house environmental audit voluntarily conducted by the Core Group Companies. Headquarters of each company audit the performance of its mill in terms of environmental conservation activities. This is currently performed by five manufacturing companies among the Core Group Companies; Nippon Paper Industries Co., Ltd., Nippon Daishowa Paperboard Co., Ltd., CRECIA Corporation, NIPPON PAPER-PAK CO.,

LTD. and Nippon Paper Chemicals Co., Ltd. Grasping and improving the present situation from two aspects of system and performance effectively accelerates environmental conservation activities.

The in-house environmental audit checks the environmental performance of the mill based on the each company's Action Guidelines compliant with the Charter on the Environment by the Nippon Paper Group. Specifically, members of the Environment Subcommittee from the company's headquarters and staff from other mills visit a mill to audit documents, including environment-related data, and then perform a site audit in the factory. Taking the characteristics of the mills into account, auditors compare the status of their environmental conservation activities, verify whether they are appropriate, point out the areas that need improvement, and report them to the president of the company. Priorities are set to the check items in this annual in-house environmental audit in accordance with the social circumstances and the issues the company has in terms of environmental conservation.

In FY 2005, Nippon Paper Industries

focused on the audit of the check/verification systems for wastewater quality survey results, as well as calibration of automatic measurement equipment in response to the falsification of data of wastewater quality that occurred in other companies in Japan in the same year.

## Environmental education and training

The Core Group Companies provide environmental education mostly to the mills and offices that have acquired ISO 14001 certification. Each mill or office offers employees opportunities to learn basic knowledge about the environment based on ISO 14001 standards, as well as hierarchical education including that for new recruits to understand the environmental policy, target, and objective and specialist education for operators of environmental facilities like the wastewater treatment plant. In addition to the education within the mills and offices, the Core Group Companies utilize training opportunities sponsored by

### Details of environmental audits

Company name	Period of audit	Priority check points	Audit results	Measures
Nippon Paper Industries Co., Ltd.	May-Aug 2005	Control of wastewater processing (check system of the survey results, etc.)	Double-checking, feedback to the sites, and regular calibration are properly performed.	For early detection and prompt response to any abnormality, sensors and continuous measurement equipment shall be fully utilized.
		Response to abnormality/emergency	There was a case where a problem occurred due to an inappropriate response to an abnormality.	Response procedures shall be optimized and education/training opportunities shall be provided in line with the current situation.
Nippon Daishowa Paperboard Co., Ltd.	May-Aug 2005	Conservation of local environment (compliance with regulated values, checking system of measurement results, response to emergency, etc.)	Imperfection in the checking system was found in one mill and then corrected. Other mills are in good condition.	More waterproof banks for chemical tanks shall be built. Manuals for abnormality detection shall be understood and emergency drills conducted.
		Use and storage of electric devices containing PCBs and disposal plan for the future	Use and storage are in good condition. Registration of PCB waste disposal at an earlier time is being studied.	Devices in operation shall be replaced sooner. Registration of PCB waste disposal shall be made at an earlier time.
CRECIA Corporation	Jun 2005	Compliance with environment-related laws and regulations	The level of management in each mill is improved due to the acquisition of ISO 14001. All regulated values are achieved.	There were some cases where a small volume of chemical leaked, while no influence was observed outside the mills. Therefore, measures shall be implemented for obsolete facilities.
		Current status of energy saving	Specific energy consumption of all mills in total has been improved by 1.7% compared to the previous year.	Energy saving shall be further promoted and specific energy consumption shall be improved by 1% or more compared to the previous year.
NIPPON PAPER-PAK CO., LTD.	Feb-Mar 2005	Current status of waste disposal	Recycling rate of 99.4% or above has been maintained as a result of enhanced separation.	Further separation shall be promoted and waste generation shall be minimized.
		Compliance with laws	No problem was observed.	Compliance with standards shall be maintained.
Nippon Paper Chemicals Co., Ltd.	Apr-Jun 2005	Current status of VOC emissions into the air and measures taken	Emissions into the air have been reduced in all mills. It is mainly due to the measures implemented but partly due to the change in brands produced. Measures should be continually implemented hereafter.	Objectives shall be set and control shall be enhanced for proper implementation of self-imposed regulations on VOC emissions into the air.

external organizations. They support employees in terms of expenses and flexibility in working hours when they participate in such external seminars for acquisition of pollution-related qualifications, like the Pollution Control Manager and expert knowledge on the latest information on the environment.

For environmental-friendly business activities, increased awareness of every employee is essential. The Core Group Companies will continue to provide educational and training opportunities and to increase awareness and power of execution of all employees.

#### Environmental education in FY 2004

Total hours of environmental education:	24,730 hours
Cumulative number of participants:	18,913

### Measures for emergencies

Most of the core subordinated companies of the Nippon Paper Group are manufacturing companies. As they use chemicals and combust fuel in boilers, they face risks of leakage of chemicals and fire.

To minimize such risks, waterproof banks are built around the tanks that contain chemicals, leakage of which may impact the environment. In preparation for a case where normal effluent treatment should become impossible because of chemical leakage, an emergency communications system was established, including a reporting system to municipalities and public fire services. Emergency drills are regularly conducted, and the communications system and equipment are reviewed as required.

When we look at FY 2004, Asahikawa Mill of Nippon Paper Industries Co., Ltd. had a fire on April 27, 2004, and Nippon Daishowa Paperboard Tohoku Co., Ltd. had one on March 14, 2005 (see page 29). Both cases were reported to the public fire service at the earliest opportunity according to the emergency procedure and thus extinguished.

### Compliance with environmental laws and regulations

In FY 2004, the Core Group Companies did not commit any serious violations of environmental laws and were not subject to accompanying monetary penalties, lawsuits, or accidents that seriously influenced the environment. In December 2004, however, dioxins in concentrations over the emission standards were

detected in an incinerator of the Geibo Mill of Nippon Daishowa Paperboard Nishinippon Co., Ltd. (Otake City, Hiroshima Prefecture). In February 2005, mercury exceeding the environmental limit was detected in the examination of river water quality conducted by Iwaki City, and it was assumed that wastewater from Nakoso Mill of Nippon Paper Industries Co., Ltd. was the cause. The details of the accidents and measures taken are explained below.

#### Report

##### ● Failure to adhere to the standard value for emission of dioxins

Geibo Mill of Nippon Daishowa Paperboard Nishinippon Co., Ltd.

It was revealed that the density of dioxins contained in gas emitted from a general-purpose incinerator exceeded the standard value.

Businesses are obligated to measure the density of dioxins from incinerators at least once a year, and the mill carried out the measurement in December 2004. The result showed the detection of dioxins at 10 ng-TEQ/m<sup>3</sup>N (the standard value is 5 ng-TEQ/m<sup>3</sup>N). It was reported to Hiroshima Prefecture, and the use of the incinerator was halted under the instruction of an administrative body.

The Mill has conducted the measurement of dioxin density regularly, but the density has never exceeded the standard value up to that time.

The cause of the excess was assumed that a large quantity of soot adhered to the internal surface and flue of the incinerator when tarred railroad crossties were incinerated in July to December 2004. The soot was cleansed and removed, and it was confirmed that the density of dioxins came below the standard when it was re-measured. Based on the facts, the "Report of Dioxins Measurement Results" was compiled and submitted to the prefecture in May. It was accepted and the operation of the incinerator restarted. To prevent such violation of standards from reoccurring, we are committed to implementing the environmental regulation compliance evaluation in accordance with ISO 14001.

##### ● Mercury leakage in drainage and measures taken

Nakoso Mill of Nippon Paper Industries Co., Ltd.

An examination of the water quality of the Hiruta River by Iwaki City in February 2005 detected 0.0053 mg/l (the environmental standard is 0.0005 mg/l or less) of mercury. Iwaki City conducted an inspection in March, revealing that drainage from the Nakoso Mill contained mercury (0.0032 mg/l), which had never been detected up to that time. Although the content did not exceed the environmental standard value for wastewater (0.005 mg/l), it was assumed that the origin of mercury was drainage from the mill.

The Nakoso Mill does not use mercury as a raw material. The on-site inspection, however, revealed that it was contained in the drainage from a equipment (called a "scrubber") for washing exhaust gas from biomass boilers (see page 49). The device has been in operation since September 2004 but no mercury was detected in the examination of the water quality in November 2004. From this fact, it was assumed that the problem did not lie in the device itself but in the fuel, which was wood waste, and that some was contaminated by mercury, and it was mixed into the drainage during a limited period only.

The mill stopped the use of wood waste. At the same time, it installed in the biomass boiler, as permanent measures, wastewater treatment equipment to eliminate mercury in the chemical reaction, even if contaminated wood waste was accidentally included as fuel. The effect was reconfirmed by our measurement.

An improvement plan adopting this method was submitted and accepted by Iwaki City. Accordingly, the Nakoso Mill restarted the use of wood waste. We adopted an environmental quality standard value as our control index, which is stricter than the standard value for industrial effluent to measure and control the mercury level in drainage.

# Environmental Accounting

## Coverage of the accounting system Expanded to the Core Group Companies

Nippon Paper Industries Co., Ltd., and Nippon Daishowa Paperboard Co., Ltd. substantially introduced environmental accounting in FY 1999 to grasp the costs and effect of environmental conservation activities quantitatively and to utilize them as guidelines for their business activities. Since FY 2003, coverage of the environmental accounting system has been expanded to the Core Group Companies.

## Overview of FY 2004

In FY 2004, the cost for environmental conservation amounted to approximately 26 billion yen, including a pollution prevention cost of 15 billion yen and a resource circulation cost of 7.4 billion yen. Investment in environmental conservation was approximately 9.7 billion yen, constituting approximately 17% of the total investment. Most of the investment went to waste treatment equipment,

water-pollution prevention equipment, and global warming preventive measures, representing approximately 73% of the total investment in environmental conservation.

As the effects of environmental conservation measures, energy saving, reduced amount of landfill, and improvement in wastewater recycling rate were observed. Direct economic effects were converted to approximately 5.2 billion yen.

### Environmental conservation costs

Categories	Key activities	Cost (million yen)
(1) Business area cost		
1. Pollution prevention cost		
Cost for preventing air pollution	Cost for operation and maintenance of air pollution prevention facilities (desulfurization, dust collection, etc.) and charge for pollution load (SOx)	5,352
Cost for preventing water pollution	Cost for operation and maintenance of water pollution prevention facilities (biological treatment, clarifiers, dehydrator, etc.)	9,192
Cost for preventing noise, vibration, odor and others	Cost for operation and maintenance of noise, vibration, odor prevention, and other related facilities. Cost for investigation, analysis, and measures against soil contamination.	416
2. Global environmental conservation cost		
Cost for preventing global warming	Cost for preventing global warming and energy conservation	81
Other global environmental conservation cost	Cost for operation and maintenance of company-owned domestic forests	629
3. Resources circulation cost		
Cost for product recycling	Cost for effective utilization of wastepaper (wastepaper recycling)	Included in manufacturing cost.
Cost for disposal, reduction and recycling of wastes	Cost for operation and maintenance of waste treatment facilities, labor cost, cost for outsourced waste treatment, transport cost, etc.	7,432
(2) Upstream / downstream cost		
Countermeasures for recycling shipped materials	Cost for recovery, retreatment, and disposal of pallet and packaging materials	1,025
Other upstream / downstream cost		109
(3) Administration cost		
Cost for the implementation of environmental management system	Cost for ISO 14001 examination and operation of a secretariat office, cost for internal environmental audits and environmental subcommittee meetings, etc.	169
Cost for disclosing environmental information	Cost for preparing environmental reports, environmental ad expenses, participation fee for environmental events, and environmental exhibitions	39
Cost for monitoring environmental impacts	Cost for measuring devices, monitoring devices, outsourced analysis, etc.	134
Cost for training employees on environmental issues, etc.	Cost for environmental education of employees and participation in external seminars. Cost for external instructors invited to internal seminars, acquisition, and promotion of qualifications authorized by the government, including pollution control managers, etc.	44
Cost for environmental improvement activities, including nature conservation, tree planting and cleaning	Cost for cleaning and planting trees on the factory sites, participation in cleaning initiatives around the factories, etc.	319
(4) R&D cost		
Pursued R&D related to environmental conservation	Cost for R&D of environmentally friendly products, R&D for reducing environmental impacts in the paper manufacturing process, labor cost of researchers, etc.	1,070
(5) Social activity cost		
Environment beautification, etc.	Natural conservation, tree planting, cleaning, and landscape conservation activities in the local communities. Donation and support for environmental organizations. Support for environmental activities by local residents, etc.	18
(6) Environmental remediation cost		
Cost for eliminating influence of environmental impact		0
Total		26,027

## Investment for environmental conservation

Categories	Key activities	Cost (million yen)
(1) Business area investment		
1. Pollution prevention investment		
Investment for preventing air pollution	Investment in air pollution prevention facilities (desulfurization, dust collection, etc.)	166
Investment for preventing water pollution	Investment in water pollution prevention facilities (biological treatment, clarifiers, dehydrators, etc.)	1,013
Investment for preventing noise, vibration, odor and other	Investment in noise, vibration, odor prevention, and other related facilities	536
2. Global environmental conservation investment		
Investment for preventing global warming	Investment in preventing global warming and energy conservation	1,929
Other global environmental conservation investment	Tree Farm project and others	931
3. Resource circulation investment		
Investment for product recycling	Equipment investment in effective utilization of wastepaper (wastepaper recycling)	954
Investment for disposal, reduction, and recycling of wastes	Equipment investment in waste treatment facilities	4,128
<b>Total</b>		<b>9,658</b>

Investment and others	Total investment in the current period	55,296
	Total research and development costs in the current period	5,725

## Environmental conservation benefit

Categories	Detail of benefits	Indicator of benefits	Monetary benefits (million yen)
(1) Benefits within the business areas			
Benefits associated with company-owned domestic forests	Income from company-owned domestic forests		
Benefits from overseas afforestation	Increase in afforested areas	2,400 ha (cumulative total 81,700 ha)	481
Benefits from energy conservation measures	Reduction in the use of fuels	50,751 kl reduction (heavy oil equivalent)	
	Reduction of CO <sub>2</sub> emissions	0.14 million ton reduction	1,141
Benefits from recycling of waste	Reduction of the volume of waste that is landfill	5,649 BDT reduction (from 23,816 to 18,167 BDT)	
	Ratio of landfilled waste by product (Pulp and Paper Div.)	0.22% (0.28% in FY 2003)	3,122
(2) Benefits corresponding to upstream / downstream			
Benefits as increased use of wastepaper	Increase in use of wastepaper	48,000 ton increase (from 3,777,000 to 3,825,000 tons)	
	Ratio of wastepaper used	51.0% (50.8% in FY 2003)	
Other upstream / downstream benefits	Pallet recovery ratio	51.3% (60.1% in FY 2003)	424
(3) Other benefits			
Benefits corresponding to research and development	Development of newsprint with high DIP composition		
	Development of high-quality newsprint production technologies		
	Development of new products of low-density paper		
	Application of cloning technology in saving endangered species		
	Expanded sales of denatured polyolefin products subject to VOC restrictions		
Benefits corresponding to social activity	Regional cleaning activities		
<b>Total</b>			<b>5,168</b>

### Standard for calculation

- The calculation is based on the "Environmental Accounting Guidelines 2002" published by the Ministry of the Environment.
- The classification is based on "Guide for Environmental Conservation Cost Classification 2003." (Pollution/health compensation money is counted as pollution prevention cost.)
- Coverage: Of all companies covered by consolidated accounting, listed on the right is coverage of the environmental accounting. In the environmental conservation benefit, however, each item specifies its own coverage.  
Nippon Paper Group, Inc., Nippon Paper Industries Co., Ltd., Nippon

- Daishowa Paperboard Co., Ltd., CRECIA Corporation, NIPPON PAPER-PAK CO., LTD., Nippon Paper Chemicals Co., Ltd., Nippon Paper Lumber Co., Ltd., SAN-MIC SHOJI CO., LTD., Nippon Paper Development Co., Ltd., KOYO PAPER MFG. CO., LTD., Kitakami Paper Co., Ltd., Nippon Paper Industries USA Co., Ltd., Nippon Seitai Corporation, Akita Jujo Chemicals Co., Ltd. (unconsolidated), PAL CO., LTD., and SHIKOKU COCA-COLA BOTTLING CO., LTD.
- Period covered by calculation: From April 1, 2004 to March 31, 2005
  - Unit: million yen (rounded off to the nearest million)

# Material Balance

## Material balance of the Nippon Paper Group

Of all businesses of the Core Group Companies, the pulp and paper, processed paper products, chemical products, housing and construction materials, and beverage businesses use raw materials and fuel to produce products. Input and output of these businesses are included in the material balance of the Core Group Companies.

In the pulp and paper business, woodchips, pulp, and wastepaper are mostly used for the production of paper and paperboard. Inorganic filler means calcium carbonate, clay mineral, and

others and is used to increase the opacity and acceptance of ink. Most of inorganic chemicals are used to produce deinked pulp and to bleach pulp.

The processed paper products produce paper containers like milk cartons and paper bags for rice. The raw materials used are base paper and resin as well as ink for print on paper containers and bags, etc.

The chemical products business manufactures dissolved pulp, which is a raw material for rayon, chlorinated polyolefin, polymer coagulant, and other products. Raw materials include woodchips and chemicals.

The housing and construction materials business manufactures

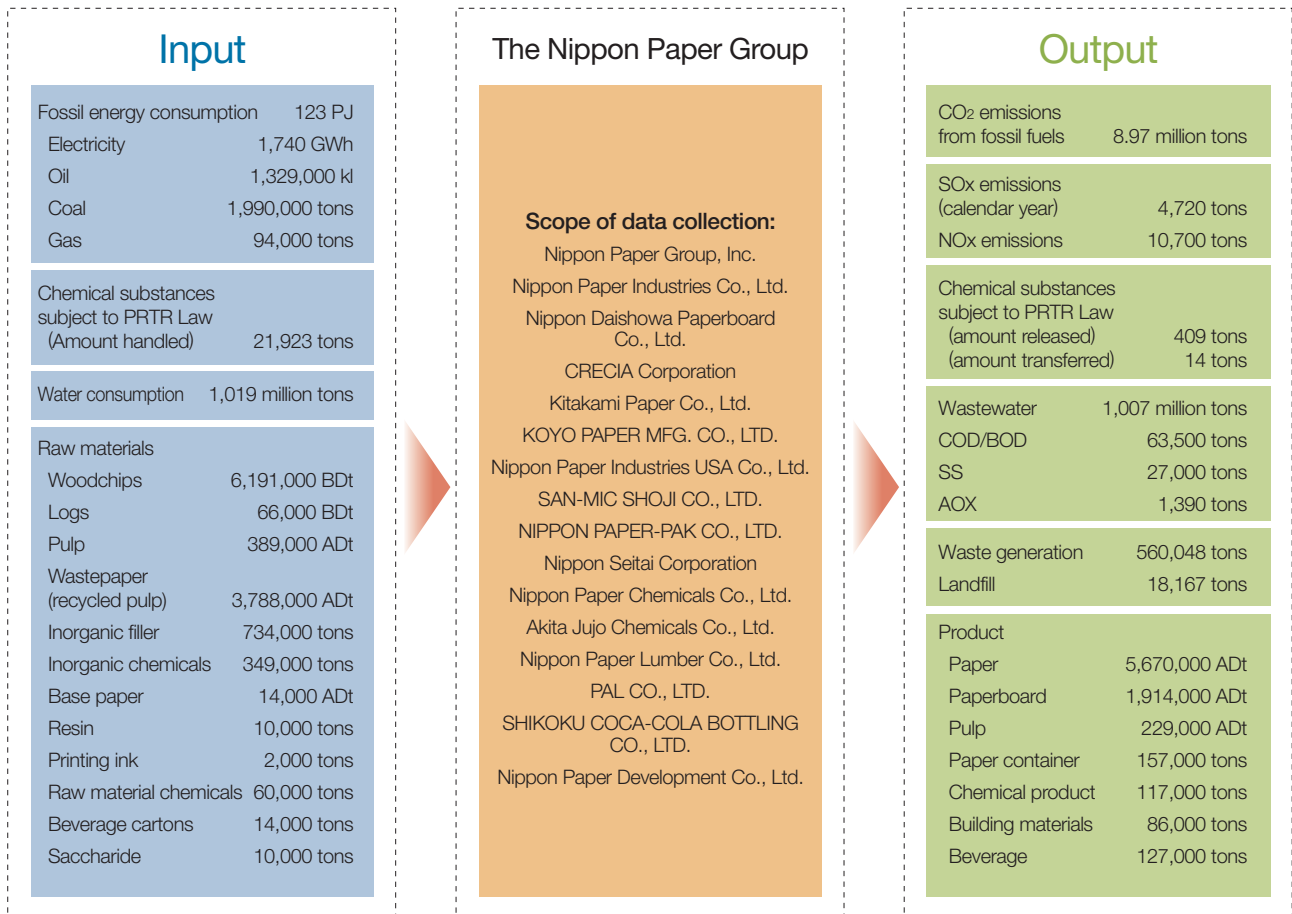
construction materials from lumber and woodchips.

The beverage business uses saccharides as the primary raw materials to produce soft drinks and beverages and packs them in containers for delivery.

All these businesses use water, and the pulp and paper business consumes the largest amount. In FY 2004, the total water consumption of the Core Group Companies amounted to 1,019 million tons.

Oil and coal are used as fuel for private electric generators. Electricity is privately generated in the pulp and paper business and part of other businesses. Other businesses purchase electricity from power companies.

Material balance of the Nippon Paper Group



**Material balance of processed paper products business  
(within Paper-related Division)**

Input		Output	
Fossil energy consumption	578 TJ	CO <sub>2</sub> emissions originated from fossil fuels	27,000 tons
Electricity	51 GWh	SO <sub>x</sub> emissions (calendar year)	3 tons
Oil	1,000 kl	NO <sub>x</sub> emissions	23 tons
Gas	1,000 tons	Chemical substances subject to PRTR Law (amount released)	29 tons
Chemical substances subject to PRTR Law (amount handled)	32 tons	Chemical substances subject to PRTR Law (amount transferred)	0 ton
Water consumption	141,000 tons	Wastewater	150,000 tons
Raw materials		Waste generation	22,401 tons
Base paper	13,000 ADt	Landfill	110 tons
Resin	10,000 tons	Product	
Printing ink	2,000 tons	Container/bag	157,000 tons

**Material balance of chemical products business  
(within Paper-related Division)**

Input		Output	
Fossil energy consumption	3.50 PJ	CO <sub>2</sub> emissions originated from fossil fuels	222,000 tons
Electricity	24 GWh	SO <sub>x</sub> emissions (calendar year)	79 tons
Oil	53,000 kl	NO <sub>x</sub> emissions	240 tons
Chemical substances subject to PRTR Law (amount handled)	17,440 tons	Chemical substances subject to PRTR Law (amount released)	142 tons
Water consumption	82 million tons	Chemical substances subject to PRTR Law (amount transferred)	12 tons
Raw materials		Wastewater	78 million tons
Woodchips	188,000 BDt	COD	7,340 tons
Inorganic chemicals	11,000 tons	SS	912 tons
Raw material chemicals	60,000 tons	AOX	84 tons
		Waste generation	1,678 tons
		Landfill	31 tons
		Product	
		Pulp	79,000 ADt
		Chemical product	117,000 tons

**Material balance of Housing and Construction Materials Division**

Input		Output	
Fossil energy consumption	526 TJ	CO <sub>2</sub> emissions originated from fossil fuels	34,000 tons
Electricity	3 GWh	NO <sub>x</sub> emissions	20 tons
Oil	12,000 kl	Chemical substances subject to PRTR Law (amount released)	5 tons
Chemical substances subject to PRTR Law (amount handled)	3,624 tons	Chemical substances subject to PRTR Law (amount transferred)	0 ton
Water consumption	17,000 tons	Wastewater	2,000 tons
Raw materials		Waste generation	731 tons
Logs/chips	77,000 tons	Landfill	559 tons
		Product	
		Construction material	86,000 tons

**Material balance of Other Division**

Input		Output	
Fossil energy consumption	186 TJ	CO <sub>2</sub> emissions originated from fossil fuels	11,000 tons
Electricity	7 GWh	SO <sub>x</sub> emissions (calendar year)	3 tons
Oil	3,000 kl	NO <sub>x</sub> emissions	3 tons
Chemical substances subject to PRTR Law (amount handled)	0 ton	Chemical substances subject to PRTR Law (amount released)	0 ton
Water consumption	910,000 tons	Chemical substances subject to PRTR Law (amount transferred)	0 ton
Raw materials		Wastewater	397,000 tons
Container	14,000 tons	COD	4 tons
Saccharide	10,000 tons	SS	2 tons
		Waste generation	1,776 tons
		Landfill	0 ton
		Product	
		Soft drinks and beverages	127,000 tons

# Material Balance

## Material balance and flow in the Pulp and Paper Division

The core business of the Core Group Companies is manufacturing and sales of pulp and paper; major products are paper and paperboard, and their main materials are woodchips and wastepaper. If we cut down forests randomly to procure raw materials, it will lead to an impact on the environment. The Core Group Companies, however, endeavor to realize sustainable raw material procurement through scheduled afforestation to secure resources, promoting acquisition of forest certifications, and avoiding purchasing illegally logged trees.

### Input

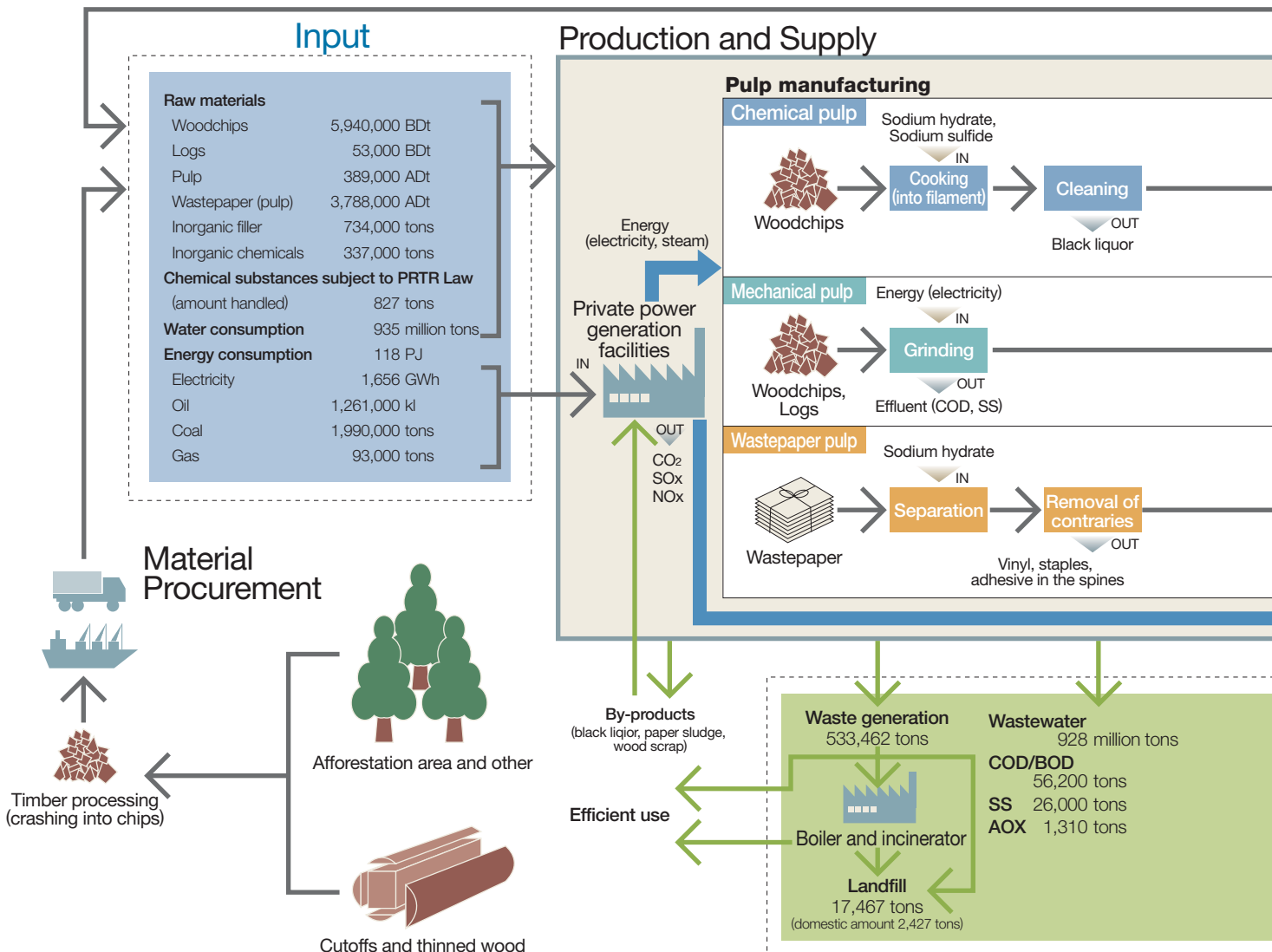
In FY 2004, the companies consumed 5,940,000 tons of woodchips and 3,788,000 tons of wastepaper and produced 7,584,000 tons of paper and paperboard. The domestic production amounted to 7,444,000 tons, excluding production by Nippon Paper Industries USA, commanding almost one-fourth of total domestic paper and paperboard production.\*

Water is essential for pulp and paper production. The Core Group Companies consumed 935,000,000 tons of water in total for the Pulp and Paper Division in FY 2004.

Pulp and paper mills consume

enormous energy. They are equipped with private electric generators having boilers that combust fuel to generate steam and turbines that generate electricity using steam as the power source. We purchase fuel for electricity generation as well as electricity itself from outside to compensate for the shortage that electricity generated by us could not satisfy. In FY 2004, we purchased 1,990,000 tons of coal and 1,261,000 kiloliters of oil. The total amount of electricity purchased from power companies was 1,656,000 MWh.

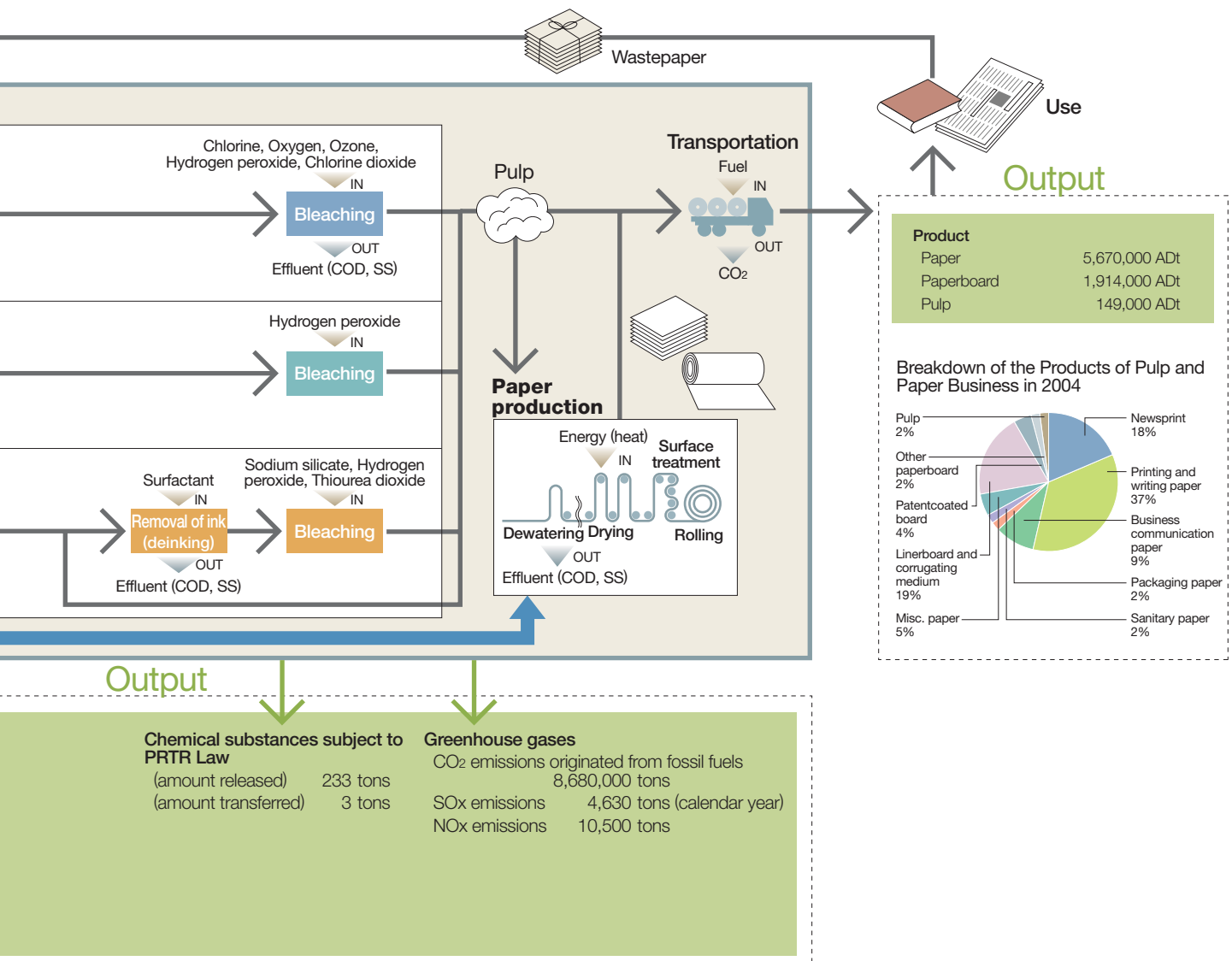
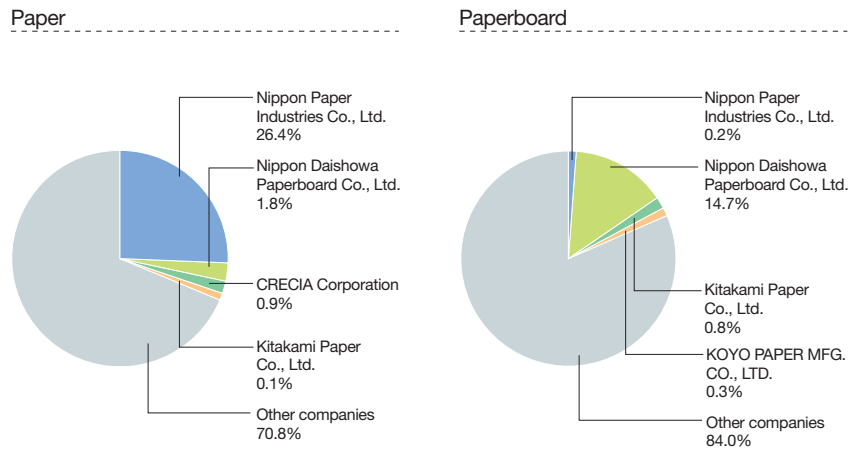
\* Source: Annual report of statistics regarding paper and paperboard 2004 issued by Japan Paper Association. Statistics for the calendar year 2004.



## Output

Carbon dioxide (CO<sub>2</sub>) is emitted as a result of combustion of fuel in boilers. CO<sub>2</sub> emissions of fossil fuel origin amounted to 8,680,000 tons in FY 2004. Coal ash and incinerator ash from the heat recovery process of paper sludge are generated during paper production. These are effectively reused as materials of cement and for other purposes. As a result of such efforts, landfill of waste was limited to 17,467 tons in FY 2004.

## Domestic production ratio of the Core Group Companies in 2004



# Targets and Performance of Environmental Conservation Activities

As each core subordinated company of the Nippon Paper Group does totally different business, we do not set up a common target for the Core Group

Companies' target for environmental conservation activities. Each subordinated company establishes its own targets based on the characteristics

of the businesses. Shown below are the targets and achievements by companies in FY 2004.

## Nippon Paper Industries, Co., Ltd.

Category of the target	Medium and long-term target	Efforts in FY 2004	
Conservation of forest resource	100,000 ha or more of overseas forests planted by the company by FY 2008.	Expansion of tree planting area.	
Green procurement of raw materials	One million BDT of woodchips absolute dry weight supplied from overseas forests planted by the company by FY 2008.	Management of trees planted by the company.	
	All domestic and overseas Company-owned forests shall acquire forest certifications by 2008.	Japan: SGEC certification acquired by all company-owned forests in Kyushu. Overseas: ISO 14001 certification acquired by all company-owned forests.	
	The ratio of certified materials and afforested trees to imported hardwood chips shall be 100% by 2008.	Expansion of ratio of forests planted by the company (to be increased from 8% in FY 2003 to 10%).	
	Ratio of deinked pulp (DIP) composed in newsprint shall be 75% or above.	Increase the ratio of DIP, while securing quality.	
Prevention of global warming	Greenhouse gas emissions reduced to 85% compared to FY 1990 by FY 2010.	Operation of biomass boilers in Nakoso Mill Operation of methane fermentation equipment in Yufutsu Mill	
	Specific purchased energy consumption improved by 10% compared to FY 1990 by FY 2010.	Operation of biomass boilers in Nakoso Mill Operation of methane fermentation equipment in Yufutsu Mill	
	Energy consumed in the transportation process reduced by 5% compared to FY 2002 by FY 2010.	Reduction of long distance and streamlining transportation.	
Reduction of landfill of waste	The ratio of landfill of waste to total product weight reduced to 0.01%.	Promotion of effective used of wastes.	
	Rate of effective utilization of wasted cargo pallets improved to 80% by FY 2010.	Disposed pallets crushed and used as woodchips for manufacturing paper or board.	

## Nippon Daishowa Paperboard Co., Ltd.

Category of the target	Medium and long-term target	Efforts in FY 2004	
Prevention of global warming	CO <sub>2</sub> emission reduced by 10% compared to FY 1990 by FY 2010.	Use of non-fossil fuel increased while use of heavy oil decreased.	
	Specific fossil energy consumption reduced by 10% compared to FY 1990 by FY 2010.	Use of non-fossil fuel increased while use of heavy oil decreased.	
Reduction of landfill of waste	The ratio of landfill of waste against total product weight reduced to 0.1% by FY 2005 and 0.01% pursued after achievement of 0.1% or less.	Promotion of effective used of wastes.	

## CRECIA Corporation

Category of the target	Medium and long-term target	Efforts in FY 2004	
Prevention of global warming	Specific energy consumption improved by 5% compared to FY 2000 by FY 2005.	Specific energy consumption improved by 1% compared to FY 2003.	
Reduction of landfill of waste	The ratio of landfill of waste to total product weight reduced to 0.1% or less by FY 2005.	Landfill of waste reduced by reducing generation of waste and effective utilization of generated waste.	

	Achievements in FY 2004	Evaluation	Future action
	81,700 ha (79,300 ha at the end of FY 2003)	Steadily expanding.	Further promote expansion.
	322,000 BDt (318,000 BDt in FY 2003) both in absolute dry weight.	Steadily increasing.	Secure stable supply from the forest planted by the company.
	Japan: 19,000 ha acquired out of total 90,000 ha (21%). Overseas: 100% at the end of FY 2004	Japan: Progressing as planned Overseas: AFS certification acquired by WAPRES	Further promote expansion of areas that acquired certifications.
	80% (76% in FY 2003) (forests planted by the company increased from 8% to 10%)	Steadily increasing.	Increase the ratio of lumber from certified natural forests.
	73.7% (72.1% in FY 2003)	Steadily increasing, just one step away from achievement	Increase the ratio of DIP with no influence on quality.
	Decreased by 2.5% compared to FY 1990.	Steadily decreasing.	Start operation of biomass boilers one after another, while promoting common energy saving measures.
	Decreased by 6.6% compared to FY 1990.	Steadily decreasing.	Start operation of biomass boilers one after another, while promoting common energy saving measures.
	Decreased by 0.4% compared to FY 2002.	Haul distance shortened, while the ratio of trucking increased.	Promote use of railroad transportation.
	0.007% (0.014% in FY 2003)	The target achieved.	Maintain the target achievement.
	66% (31% in FY 2003).	Steadily increasing.	Further increase the rate of effective utilization.

	Achievements in FY 2004	Evaluation	Future action
	Decreased by 10% compared to FY 1990.	The target achieved.	Further promote reduction.
	Decreased by 10.3% compared to FY 1990.	The target achieved.	Further promote energy saving.
	0.078% (0.13 points improvement compared to the previous fiscal year)	The target achieved.	Further promote the effective use.

	Achievements in FY 2004	Evaluation	Future action
	Improved by 1.67% compared to FY 2003.	The target for FY 2004 achieved.	Further promote energy saving.
	The ratio of landfill of waste to total product weight reduced to 0.034%.	The target achieved.	Further reduce landfill and aim at achieving 0.01% or less against total product weight.

# Promoting the Use of Wastepaper and the Recycling of Raw Material

## Promoting investment in wastepaper recycling facilities

The domestic paper manufacturing industry has endeavored to increase the use of wastepaper. Wastepaper consumption was 4.7 million tons in 1970, 7.86 in 1980, 14.49 in 1990, and has shown an increase to 18.54 million tons in 2004. The ratio of wastepaper to all types of raw materials of paper exhibits an increase as well, marking 41.5% in 1980, 51.5% in 1990, and 60.4% in 2004.

On the other hand, the base paper for cardboard does not need a high brightness and therefore, deinking is not required. The wastepaper utilization rate in domestically produced paperboard exceeds 90% and always maintains a high level. For print paper or copy paper, on the other hand, deinking or bleaching is essential, and the use of wastepaper has been slow in this field for technical reasons.

The Core Group Companies strived to increase the amount of recycled fiber used in papermaking by pushing up the rate of composition of recycled fiber used in newsprint, one of the paper categories. In FY 1999, approximately 11 billion yen was invested, and new plants were built in Kushiro Mill and Ishinomaki Mill of Nippon Paper Industries Co., Ltd. with daily output of 540 tons in total.

When we see FY 2004, the DIP3 line in the Iwanuma Mill of Nippon Paper Industries increased its production capacity to 290 tons, and production of DIP with a high brightness was enabled in January 2005. Investment in wastepaper treatment facilities of the Core Group Companies amounted to 2.56 billion yen in FY 2004.

## Endeavor to increase deinked pulp (DIP) in newsprint

Pulp fiber is separated from wastepaper to produce recycled fiber. The next process is deinking and bleaching, but the required degree differs from product to product.

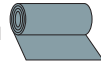
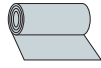
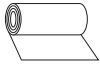









Of all paper and paperboard, paperboard, which is the base of cardboard, does not need deinking and bleaching. Therefore, use of recycled fiber is easy, and the wastepaper utilization rate exceeds 90% in this category. Conversely, for paper, especially printing

paper, the rate is below 40%.

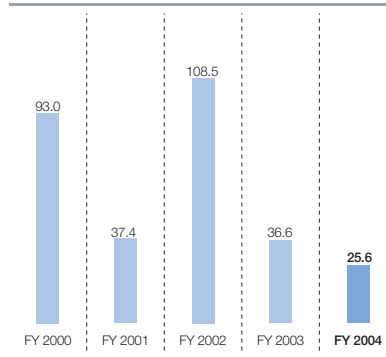
Paper is used as information media and requires a high level of brightness and a long storage life. When recycled fiber is mixed into printing paper, it should be deinked and then bleached using chemicals. It is different from kraft pulp, one of the major components of paper, and its production process requires an outside energy supply. The concurrent cost and environmental impact are the causes that inhibit the use of wastepaper in the production of paper.

For newsprint, the required brightness and long storage life is lower than other types of paper but opacity and

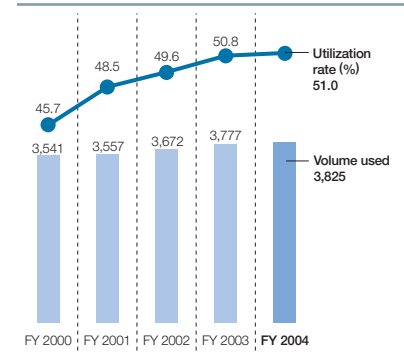
Comparison of characteristics and wastepaper applicability by type of paper

Type of paper	Paperboard 	Newsprint 	Printing paper 
Required brightness	Low	Medium	High
Current major raw material	Recycled fiber 	DIP 	Kraft pulp 
Applicability of wastepaper			Needs bleaching 
	 ↑ Recycled fiber	 ↑ DIP ↑ Deinking	 ↑ Bleaching (requires high production cost)

Total investment into wastepaper processing facilities (unit: 100 million yen)



Volume used and utilization rate of wastepaper\* (unit: 1,000 ADt)



\* Utilization rate = wastepaper / (wastepaper + other pulps)  
 Coverage: Nippon Paper Industries Co., Ltd., Nippon Daishowa Paperboard Co., Ltd., CRECIA Corporation, KOYO PAPER MFG. CO., LTD., Kitakami Paper Co., Ltd., Nippon Paper Industries USA Co., Ltd.

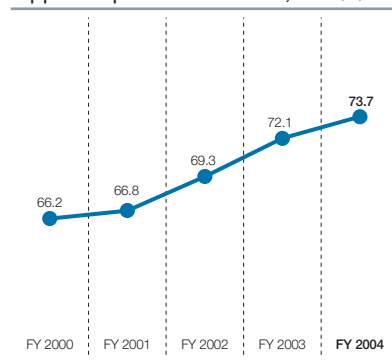
Management Structure  
 Feature Story: Raw Material Procurement  
 In the Market  
 For the Global Environment  
 With Employees  
 In Society

ink acceptance are required. In addition, a large amount of newsprint needs to be printed in a very limited period of time by its nature and, thus, requires high intensity and operability. Mechanical pulp satisfies these requirements and has often been used in newsprint, while it consumes a large quantity of energy in the production process.

When we consider the issue of production cost and energy consumption, it is more advantageous if we use wastepaper pulp (DIP) for newsprint, which does not require a high level of brightness and originally used mechanical pulp, than to use it for printing paper of high quality.

Nippon Paper Industries Co., Ltd., dealing in the paper business, aims at achieving a 75% mixture ratio of DIP used in newsprint. The figure was about to reach 74% in FY 2004 and target achievement is only one step away.

Mixture ratio of DIP in newsprint by Nippon Paper Industries Co., Ltd. (%)



### Promoting recycling of beverage cartons NIPPON PAPER-PAK CO., LTD.

NIPPON PAPER-PAK CO., LTD., one of the major subordinated companies, plays an active role in recycling of milk and juice cartons.

Made of virgin pulp, which includes no recovered fibers, beverage cartons can be recycled as high-quality raw material for papermaking. Therefore, NIPPON PAPER-PAK recovers brokes (cutoffs) generated in its carton production process and offers them to another Group company, CRECIA Corporation, where those recovered are recycled into facial tissue and bath tissue. As a member of voluntary organizations such as the Committee for Milk Container Environmental Issues\*1 and the Japan Milk Carton Recycling Association\*2, NIPPON PAPER-PAK supports various activities to further the carton recycling. During the event named "Thanksgiving for Green — Forest Market"\*3 held in April 2005 under the sponsorship of the Forestry Agency of the Ministry of Agriculture, Forestry and Fisheries of Japan, the company exhibited panels which explained how milk cartons are made and can be recycled, and distributed brochures on recycling together with pocket-size facial tissue made from recycled fibers. In Eco-Products 2004\*4 held in December 2004, an environment-related exhibition, it hosted an open workshop where visitors experienced manufacturing postcards from used milk cartons, so as to enhance their interests in and understanding of beverage carton recycling.

In line with the increased awareness of environmental conservation, Japan's recovery rate of beverage cartons, including industrial brokes, rose from 19.9% in FY 1994 to 34.3% in FY 2003; however, more than 60% has still been disposed as solid waste. To improve the situation, the Committee for Milk Container Environmental Issues has set a target to raise the recovery rate up to 50% or more by FY 2010 and started

promotions to install recovery boxes for milk cartons in liaison with the Japan Milk Carton Recycling Association. It appeals for cooperation on this project to schools, local governments, public facilities and stores across the nation, while encouraging consumers' involvement by posters and other publicity on recycling. NIPPON PAPER-PAK participates in these types of activities in a proactive manner and contributes to broader acceptance of beverage carton recycling in Japan.

\*1 **Committee for Milk Container Environmental Issues:** An organization consisting of dairy companies, packaging suppliers, recycled paper manufacturers, etc. It has been involved in educational activities for milk carton recycling and provides publicity about environmental issues of cartons.

\*2 **Japan Milk Carton Recycling Association:** A nationwide organization that discusses recycling of milk cartons.

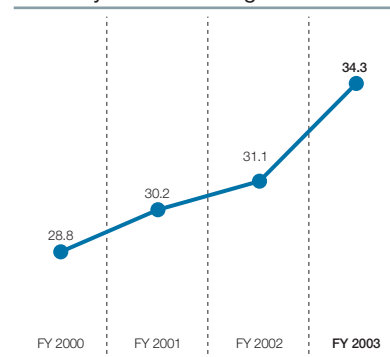
\*3 **Thanksgiving for Green — Forest Market:** An event held annually in Tokyo. Exhibiting woodworks, handicrafts, and folk entertainment from all over Japan, the municipalities and organizations that are engaged in forestation and/or development of mountain villages help urban dwellers deepen their appreciation of Japanese forests, forestry, and the management of national forests.

\*4 **Eco-Products:** Japan's largest environment-related exhibition hosted by Japan Environmental Management Association for Industry and Nihon Keizai Shimbun, Inc. Gathering more than 450 companies, environmental NGOs and NPOs, governments, municipalities, universities and research institutes, it introduces environmentally-friendly products (Eco-Products) for consumer as well as business and offers opportunities to exchange information on environmental issues.



Recovery box for beverage cartons

Recovery rate of beverage cartons (%)



# Efforts to Prevent Global Warming

## Overview of FY 2004

With the effectuation of the Kyoto Protocol,\* prevention of global warming on a world scale entered a new phase. Japan is obligated to cut its emissions by 6% below 1990 levels during the period 2008–2012, and both public and private sectors need to endeavor to achieve the target.

Most of the gas emitted from business activities of the Core Group Companies is CO<sub>2</sub>. To contribute to the prevention of global warming through the reduction of CO<sub>2</sub>, they devote efforts to energy saving and effective utilization of non-fossil fuel, setting goals for reducing greenhouse gas emissions from fossil fuels (CO<sub>2</sub> equivalent) to 85% of the actual figure in FY 1990 by the end of FY 2010 for Nippon Paper Industries Co., Ltd. and 90% for Nippon Daishowa Paperboard Co., Ltd., as well.

In FY 2004, CO<sub>2</sub> emissions from the burning of fossil fuels by the Core Group

Companies amounted to 8,970,000 CO<sub>2</sub>-t, a reduction of 1.5% compared to the previous year (102% of FY 1990). This was due to the commencement of operations of a biomass boiler in the Nakoso Mill of Nippon Paper Industries in October 2004, improvement in the combustion efficiency of boilers in Nippon Paper Industries USA, increase in biomass energy consumption instead of fossil fuel, and other energy saving activities conducted by each mill.

\* The Kyoto Protocol came into effect on February 16, 2005. This obligates 30 developed nations to achieve their own targets for reduction of greenhouse gas emissions.

## Overview of greenhouse gas emissions from the Pulp and Paper Division

In the Pulp and Paper Division, the Group's key business, the amount of products (paper, paperboard, pulp, etc.) amounted 8.02 million tons and fossil fuel energy consumed showed a 1.6% decrease from the previous year to 118 PJ (94.4% of FY 1990). As a result, specific fossil energy consumption amounted to 14.8 GJ/product-ton, which is a reduction of 3.7% from the previous year. The greenhouse gas emissions from the Pulp and Paper Division (CO<sub>2</sub> equivalent) were 8.68 million tons, a reduction of 1.5% from the previous year (99.6% of FY 1990). The specific energy consumption was 1.08 CO<sub>2</sub>-tons/product-ton and a reduction of 3.5% from the previous year.

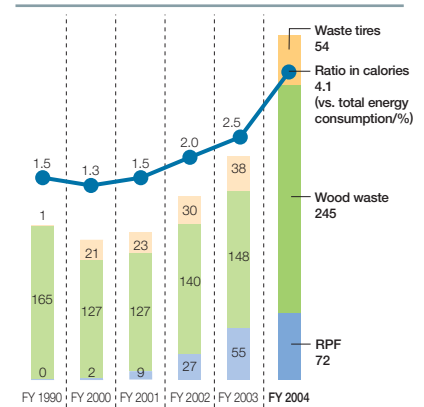
## Efforts to reduce CO<sub>2</sub> emissions

### Effective utilization of non-fossil fuels

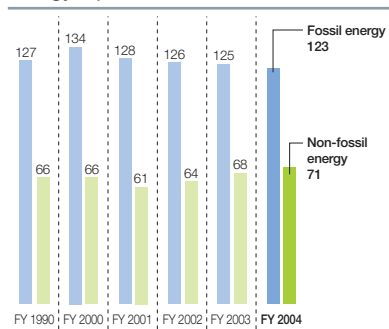
In the pulp and paper production process, energy has been recovered in the form of steam and electricity from black liquor generated from the pulp process and paper sludge from the dewatering process, which has reduced the consumption of fossil fuel, such as heavy oil. Recently, the Core Group Companies have promoted the purchase and effective use of non-fossil fuels, including RPF, waste tires, and wood waste, in place of fossil fuels.

For consumption of non-fossil fuel in the Pulp and Paper Division in FY 2004, RPF amounted to 72,000 tons, waste tires amounted to 54,000 tons, and wood waste amounted to 245,000 tons. Their calorie equivalent was 4.1% of total fuel consumption, resulting in a 1.6% increase from FY 1990.

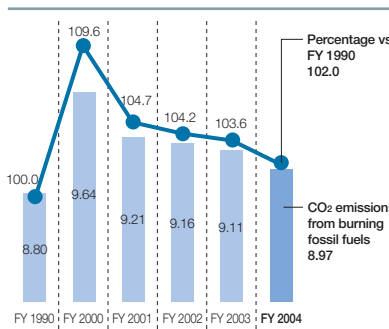
### Consumption of new non-fossil fuels (1,000 tons) and ratio in calories (%) in the Pulp and Paper Division



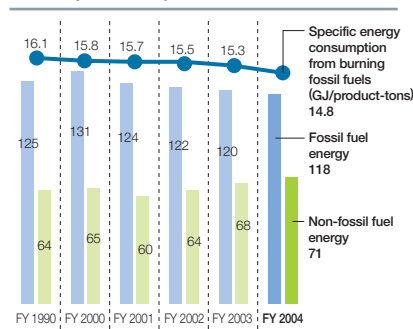
### Energy input in all businesses (PJ: 10<sup>15</sup>J)



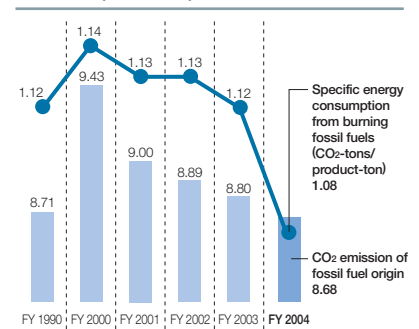
### CO<sub>2</sub> emissions from burning fossil fuels in all businesses (million tons)



### Energy input and specific energy consumption of fossil fuel energy in the Pulp and Paper Division (PJ: 10<sup>15</sup>J)



### CO<sub>2</sub> emissions from burning fossil fuels in the Pulp and Paper Division (million tons)



### Biomass power generation systems fueled by wood waste

In October 2004, a fluidized bed boiler mostly fueled by wood waste and a 15,000 kW steam turbine generator power plant were completed at the Nakoso Mill of Nippon Paper Industries Co., Ltd.

At the Nakoso Mill, 34,000 kiloliters of heavy oil has been consumed per year to generate steam and electricity with a heavy oil boiler and a diesel generator to supply the production process. The new boiler combusts approximately 90,000 tons of wood waste as the main fuel, which would have been disposed of as industrial waste otherwise, and reduces heavy oil consumption by approximately 98%. As a result, CO<sub>2</sub> emissions from the burning of fossil fuel will be reduced by approximately 100,000 tons per year. In addition, the co-generation system supplies steam. In total, the energy efficiency of the power generation system is as high as 66%, which is more than 150% of ordinary industrial thermal power plants. The boiler is equipped with bag filters to remove dust from emission gas and with wet desulfurization equipment to remove sulfur oxide, thus proving its environmental friendliness.

Following the Nakoso Mill of Nippon Paper Industries, the Ishinomaki Mill, Fuji Mill, and Iwakuni Mill plan to build biomass power generation systems as well. For the existing boilers of each mill that can use non-fossil fuel, use of such fuel is promoted.

#### Plans for introduction of biomass power generation systems

Name of mill	To be completed	CO <sub>2</sub> reduction
Ishinomaki Mill	October 2006	120,000 tons/year
Fuji Mill	October 2007	200,000 tons/year
Iwakuni Mill	February 2008	280,000 tons/year

### Establishing a non-fossil fuel procurement system

In addition to the introduction and expansion of biomass power generation systems as well as promotion of energy conversion in existing facilities, a stable

non-fossil fuel procurement system is being prepared. In FY 2004, we endeavored to increase procurement from existing suppliers and cultivate new suppliers, resulting in a substantial increase in the amount of non-fossil fuel procurement and consumption compared to the previous year. Nakoso Mill of Nippon Paper Industries commenced operation of a biomass power generation system in October and has established a stable procurement system for wood waste fuel mostly from suppliers in the Kanto Area.

The Ishinomaki Mill, Fuji Mill, and Iwakuni Mill of Nippon Paper Industries are also planning to build biomass systems and endeavor to complement the shortage of non-fossil fuel from the Kanto and Kansai Areas, where a huge quantity of such fuel seems to be generated, while securing the fuel from the neighboring areas of each mill.

Through utilization of wood waste, Nippon Paper Industries is committed to contributing to the reduction of the burden of waste disposal issues, which is becoming more serious.



Biomass boiler under construction (Ishinomaki Mill of Nippon Paper Industries)

### Efforts for introduction of anaerobic wastewater treatment equipment

In July 2005, a demonstration plant of anaerobic wastewater treatment equipment started operation in the Iwakuni Mill of Nippon Paper Industries Co., Ltd. This is the second plant operation following the Yufutsu Mill of the same company in August 2004. Anaerobic wastewater treatment equipment effectively utilizes methane gas generated from the treatment process as fuel. By burning the gas in the boiler as fuel in place of heavy oil, 10,000

tons of CO<sub>2</sub> emissions are expected to be reduced yearly.



Anaerobic wastewater treatment equipment (Iwakuni Mill of Nippon Paper Industries)

### Saving energy in the general-purpose devices

Engineering works for energy saving, including conversion to inverters in driving motors and other general-purpose devices, are underway at Nippon Paper Industries Co., Ltd. The company plans to achieve 1.5% in energy savings compared to FY 1990 each year from FY 2003 to FY 2005. A total of 454 engineering projects were conducted in FY 2004, saving energy of 55,752 kiloliters (crude oil equivalent) or achieving a 1.19% reduction compared to FY 1990, but the target was not achieved. One of the factors in the failure lies in the difficulties finding the points requiring energy saving after years of positive efforts. To achieve the target in FY 2005, Nippon Paper Industries established an Energy-Saving Exploration Team at one of its affiliates, Jujo Research\*, to find general-purpose devices that can be subject to the engineering projects for energy saving in each of the company mills.

Twenty-one engineering projects at Nippon Daishowa Paperboard Co., Ltd. reduced energy consumption by 7,265 kiloliters (crude oil equivalent), nine projects reduced consumption by 1,423 kiloliters at CRECIA Corporation, and two projects reduced consumption by 420 kiloliters at NIPPON PAPER-PAK CO., LTD.

\* Jujo Research deals in technical information surveys, translation, and consulting in terms of pulp and paper.

# Efforts to Prevent Global Warming

## Promoting rationalization of logistics and energy saving

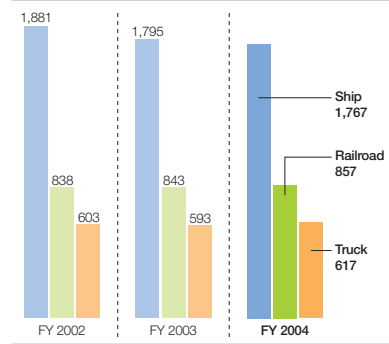
In FY 2004, traffic volume of Nippon Paper Industries Co., Ltd., showed an increase to 102.2% and energy consumption to 101.9% compared with the previous year.

The company, however, reviewed the positional relationship between production and consumption areas and promoted reselection of an appropriate production site to reduce distant or crossed transportation. As a result of such streamlining efforts in distribution, ton kilometers\* leveled off to 100.3% compared to the previous year. Energy consumption per traffic volume was reduced to 99.7%.

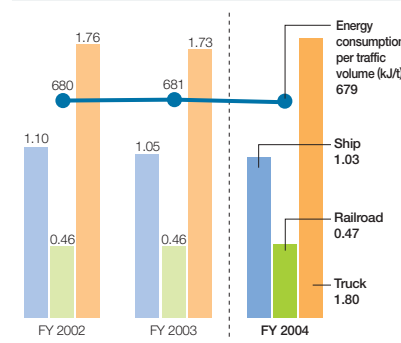
Means of transportation is a factor that exerts a heavy influence on the volume of energy consumption. In the statistics for traffic volume by means of transportation at Nippon Paper Industries in FY 2004, the ratio of motor trucks showed a 0.8% increase, railroads a 0.1% increase, and ships a 0.9% decrease compared with the previous year. This reflects the shift from long-distance transportation like railways and ships to short-distance transportation like trucks, following the policies of reselection of appropriate production sites and streamlined distribution. While the transportation distance shortened, the ratio of trucks, the environmental impact of which is higher than that of railroads and ships, increased. It offsets the reduction of energy consumption made by the shift. We will try to use a means of transportation with a lower environmental impact, while continuing efforts to shorten the transportation distance.

\* Ton kilometer = traffic volume x transportation distance

Traffic volume by means of transportation (unit: million tons x kilometers)



Energy consumption by means of transportation (PJ)



## Promoting acquisition of Green Management Certification

To further promote environmental conservation activities, Nippon Paper Industries Co., Ltd. recommends that distribution partners acquire Green Management Certification. Among all affiliates, Hotoku Co., Ltd. acquired the certification following NANKO Butsuryu Support Co., Ltd.

The scope of Green Management Certification was expanded in July 2005 to include domestic shipping and warehousing companies and almost all distribution companies that have business with Nippon Paper Industries (excluding railroad service) are covered. Taking this opportunity, Nippon Paper Industries will also expand the scope of the recommendation to domestic shipping and warehousing companies in addition to trucking companies. We do not limit our



Green Management Certification Mark

activities to giving recommendations only but will place priority on the companies that acquired certification.

## Promoting CO2 absorption and sequestration through management of company-owned forests

Of all the functions forests have, CO2 absorption and sequestration attract the most attention as they contribute to the prevention of global warming. This is a function where trees absorb CO2 in their growth phase and retain it in the trunks and branches for a long period of time. Nippon Paper Industries Co., Ltd. appropriately manages its domestic company-owned forests of 90,000 ha and sequesters 250,000 tons of CO2 per year.\*

\* Method to calculate CO2 sequestration in domestic forests has not been fixed yet. Nippon Paper Industries uses the method specified in the "Evaluations of Multiple Functions of Forests (November 2001)" defined by the Science Council of Japan.

Estimation of CO2 absorption and sequestration by company-owned forests

	Ratio (%)	Area (ha)	Volume grown (m <sup>3</sup> /ha)	Density (BDT/m <sup>3</sup> )	Annual sequestration (BDT)	Carbon coefficient	Conversion factor	Expansion factor	Volume of CO2 sequester CO2-t
Artificial forest	Softwood	41 %	37,000	5.96	0.450	99,234	C-t/BDT	X 3.67	X 1.70 =
	Hardwood	1 %	1,000	3.85	0.540	2,079			
	Total	42 %	38,000			101,313			
Natural forest	Softwood	12 %	11,000	1.31	0.450	6,485	CO2 emissions by harvesting trees (subtracted from sequestration)		-
	Hardwood	40 %	36,000	1.39	0.540	27,022			
	Total	52 %	47,000			33,506			
Bare land	6 %	5,000							
Total	100 %	90,000			134,819				

The company's original coefficients are adopted.

Coefficients in the "Evaluations of Multiple Functions of Forests (November 2001)" defined by the Science Council of Japan are adopted.

# Effectively Utilizing Water Resource

## Overview of FY 2004

Water plays an extremely important role in the production of pulp and paper and is an essential resource. Wood chips and wastepaper are suspended in water to react with chemicals. Pulp is extracted from the water. Then, the pulp is suspended in water again and dehydrated while spread thinly and evenly on the wire. By drying it with heat, paper is completed. As production of paper pulp increases, the volume of required water also increases.

In other industries, water is mostly used to cool production equipment. In the paper manufacturing industry, most water is used in the production process for pulp and paper. As the water used in such a process will be contaminated by

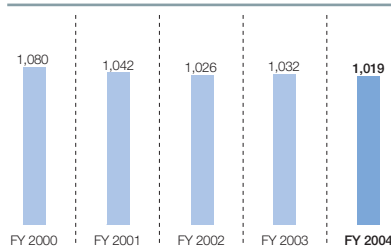
organic matter and chemicals in the raw materials, application of recycled water is very limited. For this reason, water consumption by the paper industry occupies more than 20% of all industries in Japan. River water, industrial water, and groundwater are supplied to the production process. River water is clarified by purifying facilities on the factory sites before use. Groundwater is generally used without treatment.

All companies in the industry started efforts to recycle water within the pulp and paper mills in earlier days. Water consumed to produce one ton of paper or paperboard exceeded 400 tons in 1965, excluding the amount of recycled water. Efforts to save and recycle water have been promoted, and it was reduced to less than 200 tons in 1980 and less than 100 tons in 2000. It means consumption was reduced to 25% or

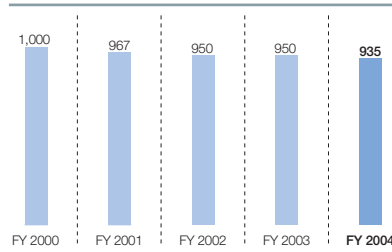
less after a 35-year effort.

The Pulp and Paper Division of the Core Group Companies used 935 million tons of water in FY 2004, for a 15 million ton reduction from the previous year. This is due to the substantial decrease in water consumption as a result of halting operations of paper machines in the Shiraoi Mill of Nippon Paper Industries and the Kaisei Mill of CRECIA Corporation. As investment in terms of saving water has been made for more than 30 years, it is difficult nowadays to dramatically reduce water consumption simply by improving equipment.

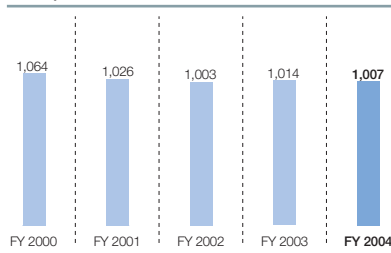
Water consumption by the Core Group Companies (million tons)



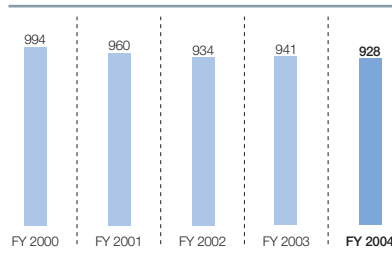
Water consumption by the Pulp and Paper Division (million tons)



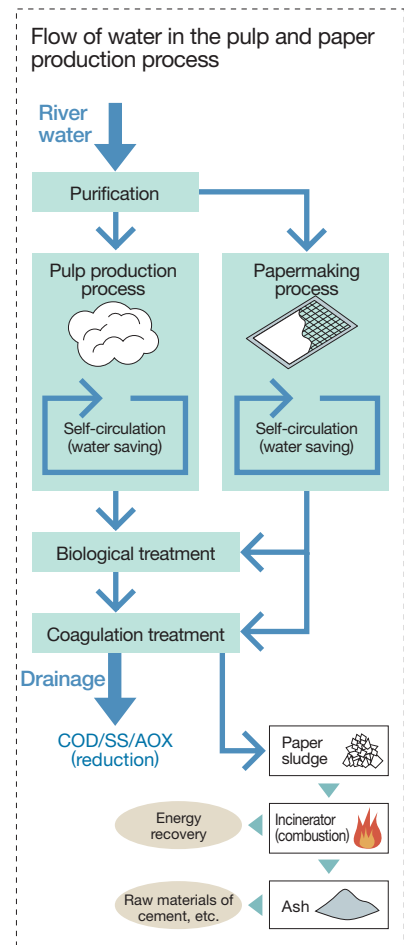
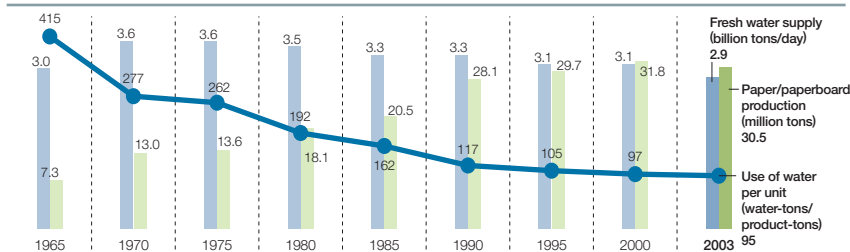
Drainage from the Core Group Companies (million tons)



Drainage from the Pulp and Paper Division (million tons)



Fresh water supply to the domestic pulp, paper and paper processing industries (calendar year)



# Efforts to Reduce Waste Discharge and Landfill

## Overview of FY 2004

Each core subordinated company of the Nippon Paper Group devotes efforts to the reduction of waste generation and landfill.

In FY 2004, waste generation by the Core Group Companies amounted to approximately 560,000 tons, for a 37,000-ton increase compared to the previous year. The landfill was 18,000 tons, a 6,000-ton decrease from the previous year.

We will tackle the effective use of wastes to further reduce their generation and landfill.

### Overview of waste generation and landfill in the Pulp and Paper Division

In FY 2004, waste generation by the Pulp and Paper Division amounted to 530,000

tons (8% increase from FY 2003) and the landfill of 17,000 tons (21.6% reduction from FY 2003). This accounts for 95% of waste generation and 96% of landfill for the Group. Ratio of landfill per product weight was 0.22%, for a 0.06% reduction from the previous year.

As for the breakdown of wastes generated from the Pulp and Paper Division, incinerated ash (ash of incinerated paper sludge and coal ash) occupies approximately 80% of waste generation, followed by sludge, wood waste, scrap metal, wastepaper, and waste plastic in that order. In FY 2004, 17,000 tons of incinerated ash and sludge were landfilled.

Progress in reduction efforts of landfill depends on the situation where a company resides even among the Core Group Companies. As Nippon Paper Industries USA Co., Ltd. has a large landfill site, it landfilled 15,000 tons of incinerated ash and sludge in FY 2004. On

the other hand, pulp and paper mills in Japan are now on the way to reducing their final landfills. Total capacity of landfill from all mills only amounted to approximately 2,400 tons. As a result of continued efforts by subordinated companies, the volume of landfill by the Core Group Companies was reduced to 40% in the last five years.

## Efforts to reduce waste generation and landfill

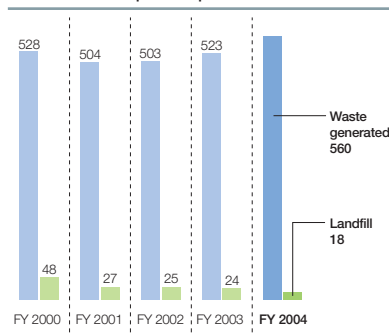
Each core subordinated company of the Nippon Paper Group sets a target for the reduction of landfill individually and makes efforts for its achievement.

### Efforts by Nippon Paper Industries Co., Ltd.

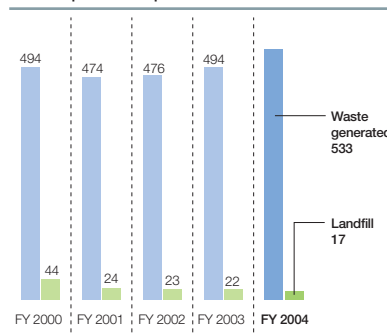
The target was set to reduce the final disposal to 0.1% of production in 1996. In March 2001, all mills achieved the target. After this, a more severe target of 0.01% was set and the effort continued.

As a change of a few tons significantly influence the rate at this stage, we promoted efforts to increase the recycling rate by inches in FY 2004. As a result, the landfill for the year was reduced to 510 tons (711 tons in FY 2003) compared with 450,000 tons of waste generation. The landfill rate per production was 0.007% (0.014% in FY 2003), achieving the target. We will maintain the level hereafter.

Waste generated and landfill by the Core Group Companies (unit: 1,000 tons)



Waste generated and landfill by the Pulp and Paper Division (unit: 1,000 tons)



### Breakdown of waste generated (tons) and major application of recycled waste by the Core Group Companies

	Amount generated (tons)	Amount effectively used (tons)	Amount of landfill (tons)	Major application of recycled wastes
Cinder	456,097	444,180	11,910	Raw material for cement, insulating agent for blast furnaces, roadbeds, etc.
Inorganic sludge	10,318	10,104	190	Base material for greening, raw material for cement, energy recovery, etc.
Organic sludge	11,488	3,577	538	Heat recovery fuel, energy recovery, dehydrating agents, etc.
Waste oil	1,179	1,116	40	Recycled oil, energy recovery, etc.
Waste acid and alkali	65	23	4	Neutralizer for water treatment, etc.
Waste plastic	7,876	7,174	546	Energy recovery, raw material for reproduction
Wastepaper/broke	33,994	33,477	12	Energy recovery, wastepaper for pulp use, etc.
Wood waste	18,756	18,664	42	Fuel chips, raw material for pallets, compost, etc.
Scrap metal	13,559	13,523	37	Raw material for metal, etc.
Waste construction material	258	227	31	Reproduced crushed stones, material for mulch, etc.
Non-industrial wastes	600	91	194	Energy recovery, etc.
Others	5,858	1,222	4,625	
Total	560,048	533,376	18,167	



Test to use ash as roadbed (Kushiro Mill of Nippon Paper Industries)

**Efforts by Nippon Daishowa Paperboard Co., Ltd.**

The company set targets to reduce the landfill to 0.1% of production by FY 2005 and then to 0.01% and is reducing the landfill.

In FY 2004, the company endeavored to reduce wastes and increase effective utilization. As a result, the landfill was reduced to 1,700 tons (4,700 tons in FY 2003), and the landfill rate per production was 0.078% (0.21% in FY 2003), achieving the target. The company will make continued efforts to further reduce wastes and increase effective utilization to achieve the next target.

**Efforts by CRECIA Corporation**

The company set targets to reduce the landfill per product weight to 0.1% of production by FY 2005 and is reducing the landfill.

In FY 2004, the company grappled with the reduction of waste generation and effective utilization, but waste generation showed a temporary increase due to the damage caused by a typhoon and production model change. As a result, waste generation was 6,111 tons (2% increase from FY 2003), the landfill was 64 tons (144% increase from FY 2003), and the landfill rate per production was 0.034%, for a 0.021% increase compared to the previous year. The company will endeavor to minimize waste generation and enhance separation and effective utilization for the achievement of the target of 0.01% or below.

**Promoting recycling pallets for disposal**

Wooden pallets for product transportation are reused as many times as possible. However, once the pallet is damaged or deteriorated and becomes unusable, most are disposed of in the consumption areas.

Nippon Paper Industries Co., Ltd. started recycling such pallets subject to disposal in FY 2003 for use as woodchips for papermaking. The company has started the recycling of pallets generated from the following five mills — Asahikawa, Ishinomaki, Iwanuma, Fushiki, and Yatsushiro — and

plans to expand the range to other mills accordingly.

In FY 2004, 55,509 out of 84,133 pallets subject to disposal were recycled, and the effective utilization rate \* was 66%. The company set a target of 80% to be achieved by FY 2010 and will further promote the program.



Pallets subject to disposal

**Product development contributing to reduction of waste treatment burden and recycling**

Nippon Paper Industries Co., Ltd.

● **WAVYWAVY**

WAVYWAVY is a paper product made of 100% natural pulp with epoch-making extensibility. It enables continuous press molding and creation of 3D images. As it can be disposed of as burnable garbage, it is expected to be used as food containers replacing plastics, as well as the raw material for models in place of expanded polystyrene. Using WAVYWAVY, Nippon Paper Industries jointly develops with Nippon Seitai Corporation an resource-saving heavy duty paper bag (WAVY Bag) demonstrating excellent crushworthiness and anti-slipping capability.



WAVY Bag

● **New package for CCP Ace, carbonless paper**

Packaging for CCP Ace, carbonless paper, was simplified to reduce materials; the material itself was changed to an easy-to-open, recyclable one.

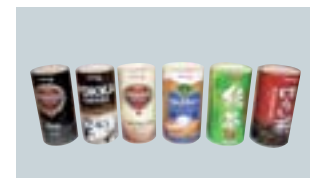


New package for CCP Ace

Nippon Daishowa Paperboard Co., Ltd.

● **Base for paper beverage carton — Cartocan**

Cartocan is a paper beverage carton made from thinned domestic lumber, which can be recycled to become facial tissue and other products. Nippon Daishowa Paperboard supplies the base as an original member of the Morikami Council (Council for Popularization of Paper Beverage Cartons to Nurture Forest)\* and promotes popularization of Cartocan to contribute to package recycling and nurturing forests in Japan.



Cartocan

\* <http://www.morikami.jp/> (The site is in Japanese only.)

# Efforts to Prevent Environmental Pollution

## Preventing water Pollution

In the pulp and paper industry, most water is used in the production process, not for cooling equipment as in many other industries. Dirty water that cannot be reused anymore is discharged from the process. The wastewater includes minute pulp fibers, filler, and soluble materials of wood origin. The pulp and paper mills of the Core Group Companies constantly measure the degree of pollution with such indices as COD\*1 / BOD\*2, SS\*3 and AOX\*4 and treat the wastewater before discharging.

The pollutants in the wastewater discharged from the production process are removed by coagulation after adding chemicals, or organic matters are decomposed and removed by biological treatment. It also adjusts the pH and releases treated water to rivers and the sea.

The substance that is contained in wastewater from the pulp and paper mills of the Core Group Companies and exerts an impact on the environment has been steadily reduced for the past five years. The volume of substances in wastewater that has an influence on the environment was almost the same as the previous year. In FY 2005, it is expected that the AOX will be substantially reduced due to the completion of converting kraft pulp bleaching equipment into ECF-based equipment in three lines.

- \*1 **COD**: The chemical oxygen demand is a measure of the quantity of oxidizing agent consumed to decompose organic matter in water, expressed as the equivalent amount in oxygen. It is a typical index to measure seawater or lake water contamination by organic matter.
- \*2 **BOD**: Biochemical oxygen demand is a measure of the quantity of oxygen consumed by the microorganisms in the decomposition of organic matter. It is a typical index to measure river water contamination by organic matter.
- \*3 **SS**: A Suspended Solid means particles 2 mm or smaller in diameter that float on the surface or is suspended in water. It includes minute particles of clay minerals with slower sedimentation, zooplankton/phytoplankton and the dead bodies, decomposed matter or attached microbes, and organic or metal sediment from sewage or industrial wastewater.
- \*4 **AOX**: Adsorbable Organic Halides are one of the indices that indicate the total amount of mostly chlorinated organic compounds contained in wastewater and are measured by the amount adsorbed by activated carbon.

## Preventing air pollution

### Minimizing emission of SOx, NOx and dust

A huge amount of electricity and steam is required to manufacture pulp and paper. The mill is equipped with boilers and turbines and power is generated privately in the mill. Sulfur in both fossil and non-fossil fuel generates sulfur oxides (SOx) and nitrogen in combusting air creates nitrogen oxide (NOx), which are emitted from exhaust flues together with vapor and CO<sub>2</sub>.

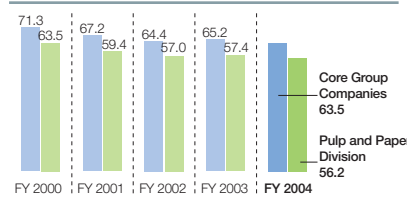
The pulp and paper mills of the Core Group Companies measure the amount of these substances contained in the gas discharged from the production process and make sure the statutory standard value is satisfied before discharging. For this purpose, mills are equipped with devices that remove SOx or dust as required.

In FY 2004, the total emission of air

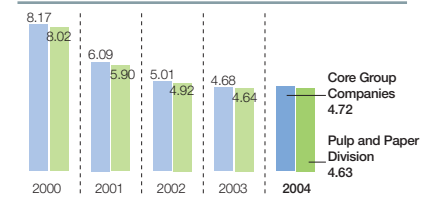
pollutants by the Core Group Companies showed a somewhat increasing trend compared to the previous year, resulting in 4,720 tons of SOx (100.8% of FY 2003), 10,700 tons of NOx (105.7% of FY 2003) and 2,020 tons of dust (102.9% of FY 2003). Some mills, however, showed a reduction.

For example, Nippon Paper Industries USA Co., Ltd. succeeded in substantially reducing SOx emissions as a result of reduced heavy oil consumption. Shiraoi Mill of Nippon Paper Industries also extensively reduced the emission of NOx and dust as a result of reduction in fuel consumption in boilers in line with the reduction in production capacity. Fuji Mill of the same company extended the facility to concentrate black liquor, and the density of solid content was increased by 6% from 66% to 72%, resulting in improved combustion efficiency and a reduction in dust emissions to approximately 70%.

Emission of COD/BOD (unit: 1,000 tons)

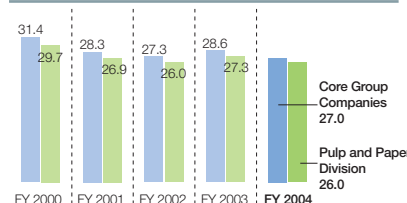


Emission of SOx\* (unit: 1,000 tons)

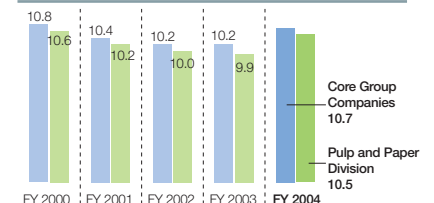


\* The weight is SO<sub>2</sub> equivalent.

Emission of SS (unit: 1,000 tons)

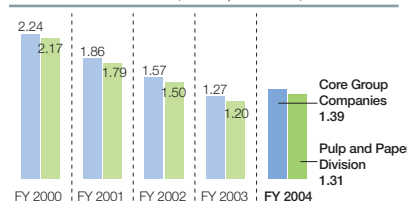


Emission of NOx\* (unit: 1,000 tons)

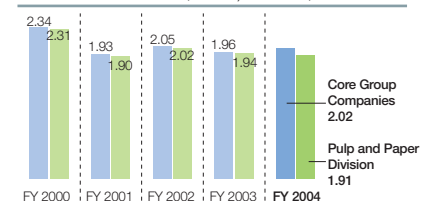


\* The weight is NO equivalent.

Emission of AOX (unit: 1,000 tons)



Emission of Dust (unit: 1,000 tons)



## Minimizing emission of hazardous air pollutant (chloroform, etc.)

When kraft pulp is bleached using gaseous chlorine or hypochlorite, chloroform and other organic compounds are unintentionally generated by the chemical reaction and emitted into the air. Nippon Paper Industries Co., Ltd. introduced the first ECF (elemental chlorine free) bleaching method in Japan to eliminate chlorine gas from the bleaching process in the Kushiro Mill in June 1996. The Yufutsu Mill introduced the first ozone ECF bleaching method\*1 as well in January 2001.

The Japan Paper Association\*2 set a goal of 35% reduction of chloroform emissions into the air by the end of FY 2003 compared to the actual figure for FY 1999. Nippon Paper Industries Co., Ltd. and Nippon Daishowa Paperboard Co., Ltd. achieved their FY 2003 targets of reduction of hazardous air pollutants including chloroform.

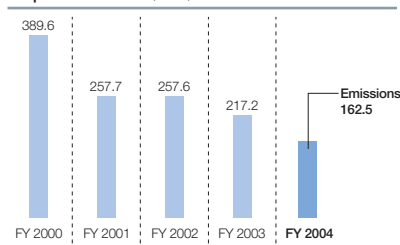
In FY 2004, the Pulp and Paper Division of the Core Group Companies emitted 162.5 tons of chloroform into the air (54.7-ton reduction from FY 2003), which means a 60% reduction compared to the actual figure in FY 1999.

In FY 2005, the Iwakuni Mill and Shiraoi Mill of Nippon Paper Industries will complete the conversion of kraft pulp bleaching equipment into ECF-based equipment. By this completion, approximately 85% of production capacity in bleached kraft pulp by the Core Group Companies will be based on ECF. We will further promote the adoption and aim at converting all kraft pulp bleaching equipment into ECF-based equipment.

\*1 **Ozone ECF bleaching:** Of all ECF bleaching methods that do not use chlorine gas, this is the method that uses ozone as a bleaching chemical.

\*2 **Japan Paper Association:** An industry organization of pulp and paper manufacturers.

Chloroform emission in the Pulp and Paper Division (tons)



## Preventing soil contamination

Raw materials and chemicals used in the pulp and paper mills do not include such soil contaminants as heavy metals or trichloroethylene. Therefore, no serious soil contamination would be observed in this industry by nature.

The soil of the former Kameari Mill of Nippon Daishowa Paperboard Industries (Katsushika-ku, Tokyo) was examined for contamination when the mill was sold. During this investigation, contamination by arsenic, fluorine and lead at a slightly higher level than the environmental quality standard was detected. The contamination, however, was limited to only a small part of the factory site, and the detected arsenic and fluorine were never used at any time in the factory's history. Lead was detected only at the point of use in the past. A total of 13,200 m<sup>3</sup> of soil was removed and treated from the detected area and the surrounding area by a subcontracted company in FY 2003 and subsequently 4,200 m<sup>3</sup> was removed in FY 2004.

### Response to the issue of lime sludge in Imaiama, Shizuoka

Lime sludge was found at the seashore of Imaiama, Fuji City, Shizuoka Prefecture. The investigation showed that it was generated from the Fuji Mill (Suzukawa) of Nippon Paper Industries Co., Ltd. (then-Suzukawa Mill of Daishowa Paper Manufacturing Co., Ltd.) and buried before 1958. The lime sludge consists mostly of calcium, and does not include any hazardous substances, but is extremely alkaline.

In March 2004, emergency mitigation measures to cover the exposed part with liner sheets and crushed stones were completed. After this, permanent measures were implemented from September 2004; 19,800 m<sup>3</sup> of lime sludge was completely removed, and the site was backfilled with gravel. The removed lime sludge was sent to a cement manufacturer for use as raw material. The permanent measure was completed in March 2005, and the completion report was submitted and accepted by Shizuoka Prefecture.



\* For the details of this issue, see the Sustainability Report 2004.

Seashore after permanent measures implemented

## Preventing noise, vibration and offensive odor

### Preventing noise and vibration

Since pulp and paper mills produce large amounts of products, the production equipment is huge. As long as the machines have motors and pumps, they could be sources of noise and vibration. In FY 2004, we received ten complaints about noise and two about vibrations.

When a mill receives a complaint, it identifies the cause. If reduction of noise or vibration is possible, we will implement appropriate measures as soon as possible. If it is difficult to take prompt action, we will make the best possible temporary solutions and then discuss and implement permanent measures. To the person who made a complaint, we will explain the current situation and the measures taken and seek an understanding. When each mill recognizes problematic noise or other issues, regardless of the presence or absence of a complaint, it will implement the necessary measures, like restraining noise generation at the source or installing soundproof devices according to the seriousness.

### Preventing offensive odor

Using a liquid mixture consisting primarily of caustic soda and sodium sulfide penetrating into woodchips, kraft pulp is made of pulp fibers extracted from the woodchips. Sodium sulfide is essential for pulp production but contains sulfur. It is a substance that tends to generate such odors as hydrogen sulfide, methyl mercaptan, methyl sulfide, and methyl disulfide. In FY 2004, we received seventeen complaints about offensive odors.

### Complaints about Noise, Vibration and Offensive Odor (FY 2004)

Company name	Noise	Vibration	Offensive odor
Nippon Paper Industries Co., Ltd.	7	1	5
Nippon Daishowa Paperboard Co., Ltd.	1	0	4
CRECIA Corporation	0	0	1
Kitakami Paper Co., Ltd.	2	1	0
KOYO PAPER MFG. CO., LTD.	0	0	0
Nippon Paper Industries USA Co., Ltd.	0	0	6
NIPPON PAPER-PAK CO., LTD.	0	0	0
Nippon Seitai Corporation	0	0	0
Nippon Paper Chemicals Co., Ltd.	0	0	1
Akita Jujo Chemicals Co., Ltd.	0	0	0
PAL CO., LTD.	0	0	0
SHIKOKU COCA-COLA BOTTLING CO., LTD.	0	0	0
Total	10	2	17

# Management and Effluent Control of Hazardous Chemical Substances

## PRTR\*1 investigation result

PRTR is a mechanism to make it clarify how hazardous chemical substances are treated and discharged in factories and other facilities. Domestic factories of the Core Group Companies have tried to reduce chemical substances subject to the PRTR Law\*2.

The basic philosophy is to stop using such substances and replace them with alternative materials, or to minimize emissions into the environment if no appropriate alternative exists. PRTR-covered chemical substances discharged from the domestic mills of the Core Group Companies into the environment, including air and public water, was 663 tons in FY 2001, but was reduced to 409 tons in FY 2004 for a 29-ton reduction compared to the previous year. This was due to progress in converting kraft pulp bleaching equipment into ECF-based equipment in the pulp and paper mills, and the reduction of emissions of chloroform, one of the PRTR-covered chemical substances.

In FY 2005, chloroform emissions will be significantly reduced due to the completion of the conversion of kraft pulp bleaching equipment into ECF-based equipment on three lines. The Core Group Companies will further promote the replacement of such substances used in the production processes and reduction of effluence of substances subject to the PRTR Law.

Results of PRTR (Japan)\*1

Cabinet order no.	CAS no.	Name of chemical substance	Unit	FY 2004			
				Amount handled (Amount generated)	Amount removed	Amount released	Amount transferred
2	79-06-1	Acrylamide	t	1,075	0	0	0
3	79-10-7	Acrylic acid	t	604	0	0	0
7	107-13-1	Acrylonitrile	t	1,205	0	0	0
24		n-alkylbenzenesulfonic acid and its salts	t	48	0	2	0
29	80-05-7	4,4'-isopropylidenediphenol (bisphenol A)	t	187	0	0	0
30	25068-38-6	Bisphenol A type epoxy resin	t	30	0	0	0
43	107-21-1	Ethylene glycol	t	24	1	0	0
44	110-80-5	Ethylene glycol monoethyl ether	t	4	1	2	1
45	109-86-4	Ethylene glycol monomethyl ether	t	1	0	1	0
63	1330-20-7	Xylene	t	639	206	50	0
65	107-22-2	Glyoxal	t	8	0	0	0
66	111-30-8	Glutaraldehyde	t	5	0	0	0
80	79-11-8	Chloroacetic acid	t	1,550	0	0	0
95	67-66-3	Chloroform	t	357	72	269	0
114	108-91-8	Cyclohexylamine	t	6	0	3	0
134	96-23-1	1,3-dichloro-2-propanol	t	9	6	1	0
176		Organic tin compounds (as Sn)	t	5	0	0	0
177	100-42-5	Styrene	t	4,588	0	9	0
179		Dioxins*2	g-TEQ	3.98	0.00	1.00	2.99
227	108-88-3	Toluene	t	2,610	13	60	11
268	106-99-0	1,3-butadiene	t	3,442	0	4	0
270	84-74-2	di-n-butyl phthalate	t	6	0	0	3
304		Boron and its compounds (as B)	t	6	0	0	0
307		Poly (oxyethylene) alkyl ether	t	10	0	0	0
309	9016-45-9	Poly (oxyethylene) nonylphenyl ether	t	14	0	0	0
310	50-00-0	Formaldehyde	t	3,807	0	5	0
313	108-31-6	Maleic anhydride	t	20	0	0	0
314	79-41-4	Methacrylic acid	t	427	0	0	0
318	2867-47-2	2-(dimethylamino) ethyl methacrylate	t	54	0	0	0
320	80-62-6	Methyl methacrylate	t	1,184	0	0	0
	Total*3			21,923	299	409	14

\*1 PRTR stands for Pollutant Release and Transfer Register.

\*2 PRTR Law: Abbreviated expression for Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management.

\*1 Substance volume handled of which is one ton or above are calculated excluding dioxins. No ozone depleting substance subject to PRTR Law as listed below is handled.

(CFC-11, CFC-12, CFC-13, CFC-114, CFC-115, Halon-1211, Halon-1301, Halon-2402, Tetrachloromethane, 1,1,1-trichloroethane, HCFC-21, HCFC-123, HCFC-133, HCFC-142, HCFC-142b, HCFC-225 and Methylbromide )

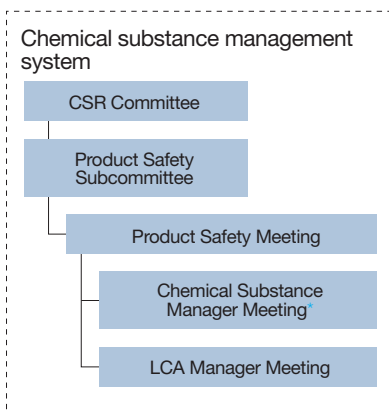
\*2 Dioxins are unintentionally generated.

\*3 Total does not include dioxins.

## Chemical management system

A variety of chemical substances is used to produce pulp and paper. Currently, apart from the volume of consumption, hundreds of chemical substances are used in the pulp and paper mills of the Core Group Companies. It is necessary to verify whether they include hazardous substances specified by the PRTR Law and Law Concerning the Examination and Regulation of Manufacturer etc. of Chemical Substances to determine if it is appropriate to continue using them.

Each subordinated company has made decisions by itself to continue to use such substances or not. However, the Core Group Companies started a new system to manage chemical substances as a whole on April 1, 2004, as a practice of corporate social responsibility by the companies. Under the Product Safety Subcommittee, one of the subcommittees that support the CSR promotion structure, the Chemical Substance Manager's Meeting was established. Participated in by major subordinate companies handling a variety of chemical substances, including Nippon Paper Industries Co., Ltd., Nippon Daishowa Paperboard Co., Ltd., CRECIA Corporation, and NIPPON



\* The Meeting consists of Nippon Paper Industries Co., Ltd., Nippon Daishowa Paperboard Co., Ltd., CRECIA Corporation, NIPPON PAPER-PAK CO., LTD., Nippon Paper Chemicals Co., Ltd., KOYO PAPER MFG. CO., LTD., and LINTEC Corporation. It investigates chemical substances, of which safety is a concern, and makes a judgment as to whether they should use them or not. The result will be reported to and examined by the Product Safety Subcommittee.

PAPER-PAK CO., LTD., the meeting manages chemical substances of the whole Core Group Companies.

### Chemical substance manager's meeting

The meeting covers the following:

- Collecting information about laws and toxicity in terms of chemical substances
- Investigating chemical substance safety and making a judgment as to whether they will continue to use such chemicals based on collected information
- Discussing policy about the management of chemicals they use
- Collecting data from the products of each mill and factory and their contents
- Sharing information between subordinate companies

To fulfill these roles, persons with expertise are necessary. The meeting consists of specialists from the Environment, Production, and Purchasing Dept. and the Research & Development Div., as well as the Quality Assurance Dept. of Nippon Paper Industries.

### Headquarters

In practice, the mills and factories manage chemical substances. The headquarters of subordinate companies administer the status of management in factories, report information to the Chemical Substance Manager Meeting, and communicate and coordinate between related divisions within the company.

### Mills and factories

The mills and factories manage chemical

substances under the ISO 14001 management system. Each mill updates, manages, and stores the MSDS.\* If there is a substance in which safety is not clear, the mill reports it to and seeks advice from the Chemical Substance Manager Meeting via the headquarters. Laboratories also check the safety of chemical substances in the development stage under the ISO system. If they find any concerns, they will seek advice from the meeting as well.

\* MSDS stands for Material Safety Data Sheet.

## Current status of PCB management

With its excellent insulation performance, PCBs have been used as insulating oil for such electric devices as transformers and capacitors. The Core Group Companies own a large number of such devices and PCBs are used in part of them.

Since it has been impossible to detoxify PCBs safely in Japan, they are currently stored in mills and other facilities. The Core Group Companies own 218 electric devices containing PCBs in operation and 906 kept in custody as of the end of FY 2004.

Operating electric devices with PCBs are being replaced in sequence by devices without PCBs. The devices not in operation are packed in stainless steel airtight containers and placed under severe control so that PCBs will not leak from the containers or percolate downward through the soil. When detoxification of PCBs is possible, the Group will commission its treatment to an external body as soon as possible.

Quantity of PCBs possessed of the Core Group Companies\*

	Transformers	Capacitors	Reactors
In operation	4	212	2
Stored	13	892	1
Total	17	1,104	3

\* The values were carefully examined by each mill in FY 2004. Therefore, some of the values may differ from the ones stated in the Sustainability Report 2004.