

Activities

We have a production process at paper mills to make paper from pulp, which is manufactured from such raw materials as wood chips and wastepaper. During the flow of production, from raw materials handling to finished product output, various circulation (recycling) processes are used, including the circulation of water and chemicals.

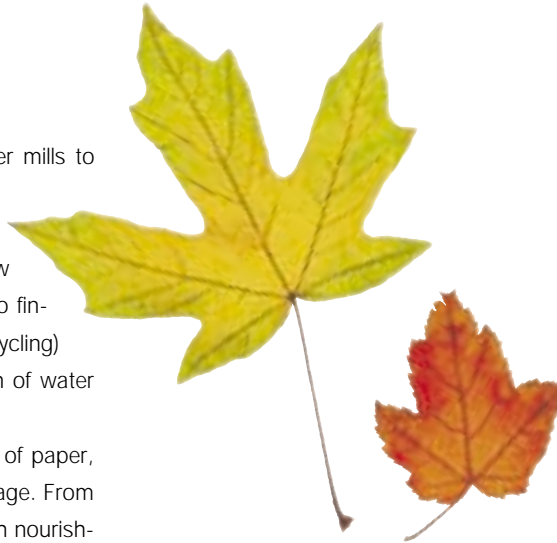
Cellulose, which is the principal ingredient of paper, can be decomposed at the final treatment stage. From a broad perspective, because trees grow with nourishment from water and carbon dioxide, the dissolving of cellulose represents one type of circulation process. By raising the efficiency of each circulation process, the environmental burden can be reduced.

Afforestation activities

Fast-growing planted trees raise the efficiency of carbon dioxide fixation. Afforesting such little-used areas as denuded land and grassland further raises the efficiency of carbon dioxide fixation.

Recycling wastepaper

Recycling paper is a prolonged process that involves the dissolution of carbon dioxide. Wastepaper that has deteriorated in quality is recovered for use as fuel, thus reducing the consumption of fossil fuels.

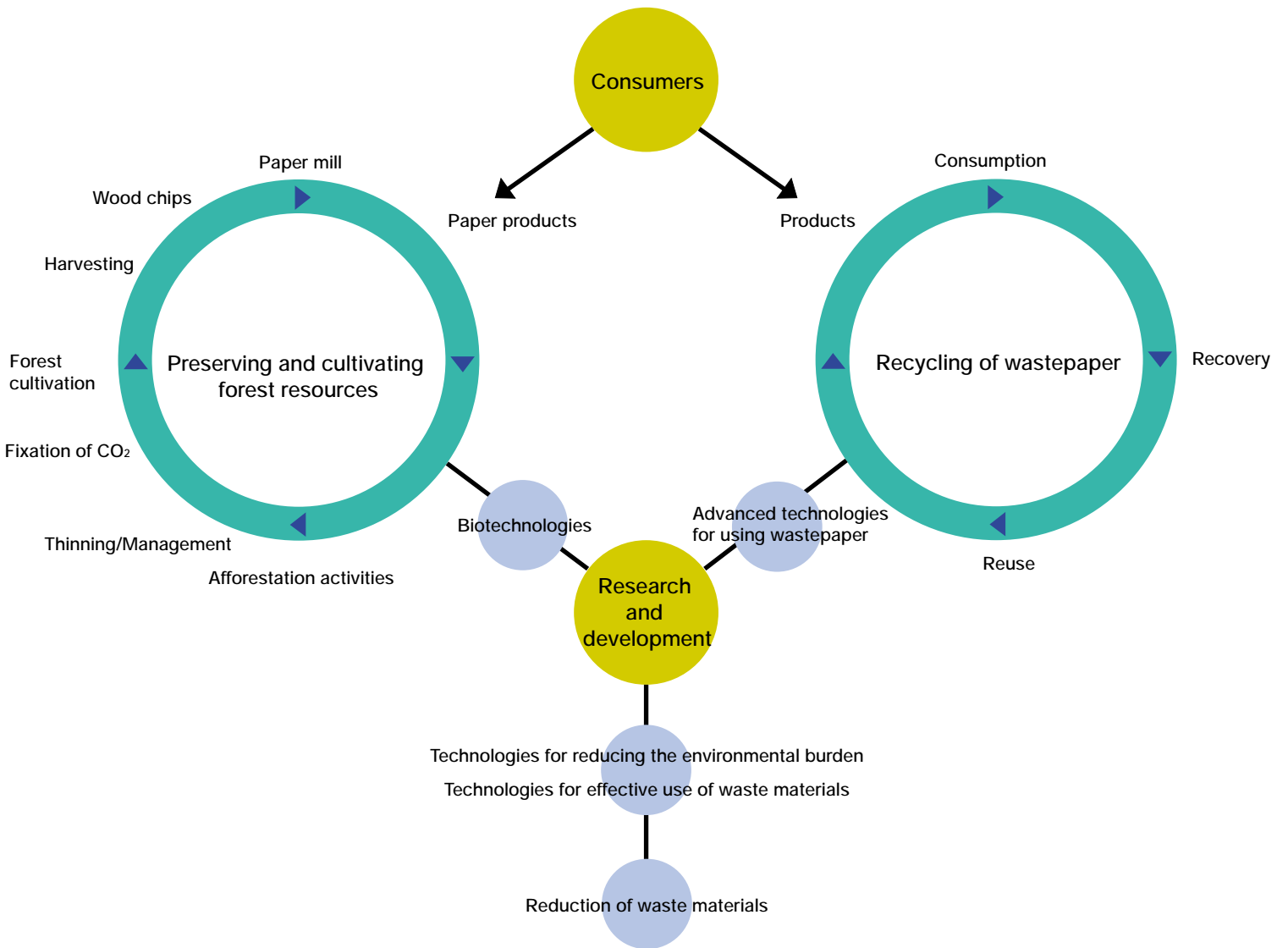


Reducing waste materials

Nippon Paper Industries is eliminating raw material losses that occur during various production and treatment processes and is conserving resources. For example, the Company is conserving resources by effectively using coal boiler ash and ash produced during the wastepaper treatment process.

Research and development

Nippon Paper Industries is developing fast-growing trees for planting that have high pulp yield and are easily transported. The Company is also developing manufacturing processes that minimize the environmental burden as well as producing easy-to-recycle products.



Overseas Afforestation Business—Tree Farm Concept

Afforestation

Based on its Tree Farm Concept, Nippon Paper Industries is involved in afforestation projects for hardwood trees overseas. The Company's afforestation activities are also guided by the Action Guideline, creating and preserving forest resources, in the Nippon Paper Industries Environmental Charter. Specific objectives include afforesting more than 100,000 hectares by 2008. Nippon Paper Industries intends to use these trees to supply more than one million bone dry tons of hardwood chips.

Upon achieving this objective, approximately one-third of all hardwood chip imports consumed by Nippon Paper Industries will be derived from trees planted by the Company overseas, thus providing a continuous supply of wood chips. Concurrently, the Company will raise the proportion of wood chips procured from its own afforested areas. By 2008, 70% of the Company's hardwood chips will be obtained from afforested areas, helping reduce the amount of wood chips supplied from natural forests.



Nippon Paper Industries commenced afforestation in Chile in 1991 and subsequently expanded the scope of its activities to Australia, South Africa, and China. To date, the Company has afforested more than 20,000 hectares.

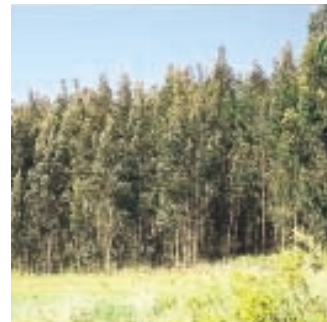
The principal type of tree planted by the Company is eucalyptus, which is harvested within 8 to 10 years after planting. These trees have been highly acclaimed for having excellent pulping yield. In addition, the specific genetic characteristics of afforested trees are more uniform in quality than those of natural trees, and high-quality pulp can be obtained. Also, maintaining or increasing forested areas through afforestation promotes CO₂ fixation, is effective in preventing salinity problems, and helps improve the earth's environment. While carrying out afforestation in accordance with the climatic and labor conditions in the countries in which it engages in these activities, the Company is taking a vigorous approach to its overseas afforestation operations.



Ground digging for tree planting



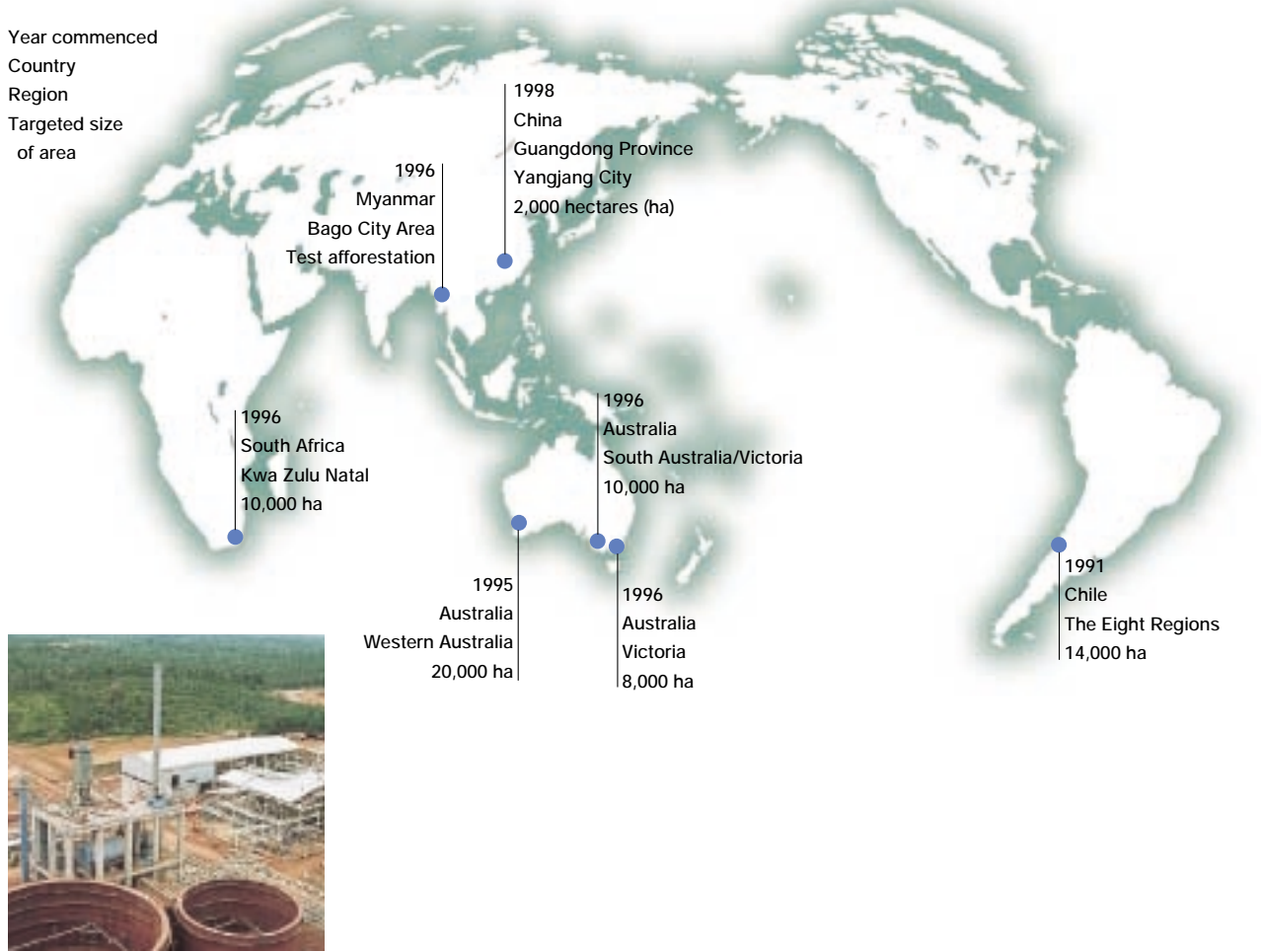
Afforested two-year-old trees approximately 4m in height



Six-year-old trees that are 18m to 20m in height

Overseas Afforestation Business (As of Oct. 1998)

Year commenced
Country
Region
Targeted size
of area



Environmental response at the Barito Project

Nippon Paper Industries, in cooperation with Marubeni Corp., the Overseas Economic Cooperation Fund, Japan, and Barito Corp., of Indonesia, is participating in the Barito Project for the construction of the Musi Pulp Mill, a pulp mill in southern Sumatra, Indonesia. Nippon Paper Industries' role in this project is to provide technological assistance for the operation of the mill.

Characteristics of the Musi Pulp Mill from an environmental perspective

It is surprising that one of the largest pulp mills in the world, with a 450,000-ton capacity, can obtain all necessary wood resources from its own afforestation activities. Furthermore, the Musi Pulp Mill, which employs the Elementary Chlorine Free (ECF) bleaching system in the production process, will serve as a model

pulp mill in the 21st century. The afforestation of approximately 190,000 hectares has already been completed, and construction is proceeding with the aim of commencing production in the first half of 2000.

The Company's role in the Barito Project

Nippon Paper Industries is dispatching engineers to the production and environment sections of the Musi Pulp Mill to transfer technical expertise that integrates the extensive know-how accumulated over many years by the Company. As part of the transfer of Nippon Paper Industries' technological expertise, the Company provided local managers, who would become involved in such activities as environmental management and effluent treatment, with on-site training for one-month periods at its mills in Japan.

Zero Discharge



Progressing with the Zero Discharge Campaign

To establish a recycling-oriented production structure that prevents the discharge of waste materials, in December

1996 Nippon Paper Industries decided to commence its Zero Discharge Campaign as a management policy at all mills. Regarding the numerical targets of its Zero Discharge Campaign, the Company has made significant progress toward reducing the volume of waste materials at the final treatment stage (landfill) to less than 1.0% of the weight of its total production volume. The Company expected to reduce this to 0.2% by the end of fiscal 1998.

What is the Zero Discharge Campaign?

The Zero Discharge Campaign aims to

- minimize the emission of waste materials and
- make efficient use of waste materials to reduce the volume of waste materials for landfill.

Results in fiscal 1997:

A progress report after one year of implementation

Through its Zero Discharge Campaign, the Company has reduced the volume of waste materials per ton of

products manufactured from 89 kgs to 76 kgs. The Company has also significantly increased the effective use of waste materials while sharply reducing the amount of waste materials for landfill.

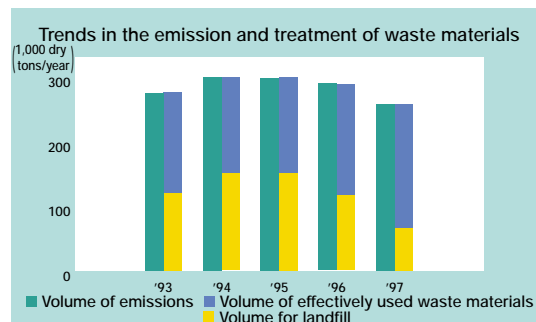
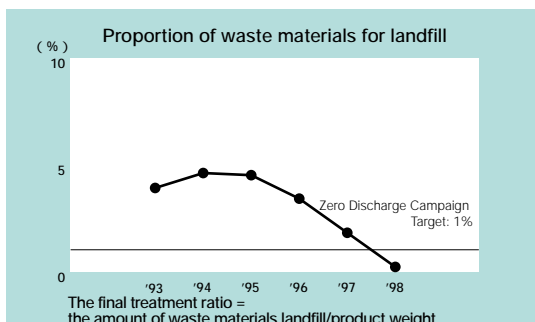


The principal approach to the Zero Discharge Campaign

Primarily by enhancing the yield of products through gradual improvements in processes and work methods, Nippon Paper Industries is effectively using waste material as alternative industrial resources. The Company is also incinerating waste to reduce its volume and using heat generated from this process to produce electricity.

For packaging and shipping material, Nippon Paper Industries is recovering its pallets and switching to recyclable packaging material. In addition, the Company is working closely with its business partners and other related parties for handling chemical product containers and powder bags.

Despite various cost and technical factors involved in implementing its Zero Discharge Campaign, the Company will strive to obtain better in-house and external understanding and cooperation.



Activated sludge treatment facilities at Iwakuni Mill



Effluent treatment

The Company's mills carry out the following treatment to comply with effluent standards.

- Activated sludge treatment.
- Coagulating sedimentation treatment and a combination of activated sludge treatment.

The Company's mills carry out the following treatment of drain sludge caused by effluent treatment.

- Incinerating drain sludge using auxiliary fuels and recovering steam and electricity from this process.
- Converting drain sludge into granulated carbon for use as a heat-insulating material in steel manufacturing.
- Using drain sludge in the paste manure carbon (PMC) greenery cultivation method.
- Reducing the volume of drain sludge through incineration and using ash produced from this process as a raw material for cement and other applications.

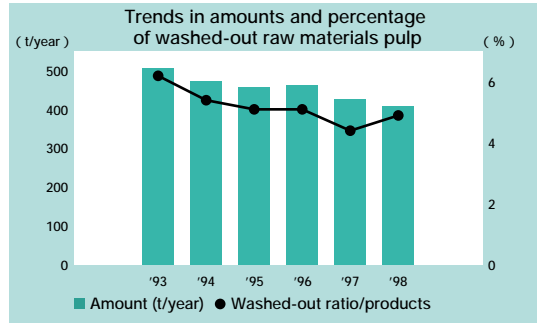
Treatment of coal ash

Coal ash accounts for approximately 60% of all waste materials, and making effective use of coal ash is thus a vital challenge. The Company's efforts in the treatment and use of coal ash include the following.

- Effectively using coal ash as a raw material for cement.
- Conducting research to expand the applications of coal ash.



Shipping of coal ash



Trends in amounts and percentage of washed-out raw materials

Pulp treatment facilities' DIP process and paper manufacturing and coating machines are the principal sources of environmental burdens. The key to addressing problems related to these sources (preventing the washing-away of raw materials) is to promote a continual awareness of such problems among employees and to take responsible action. To continually monitor the amount of effluent, the Company has installed numerous continuous concentration measuring devices at each mill. Also, the Company is implementing extensive measures to recover effluent with solid contents.

Recovery of regular garbage by type

As part of its Zero Discharge Campaign, the Company works to minimize amounts of regular garbage. To ensure the complete separation of various categories of garbage, the Company is increasing the number of types of garbage collection boxes at each of its mills. Based on the slogan, "If mixed, it's trash; if separated, it's a resource," Nippon Paper Industries is taking a highly focused Companywide approach to separating such items as wastepaper, cans, and plastics.

All employees are working to minimize amounts of garbage by taking steps that include reducing their use of disposable eating utensils and converting leftover food into compost at the workplace for use as fertilizers in flower beds.

Reduction



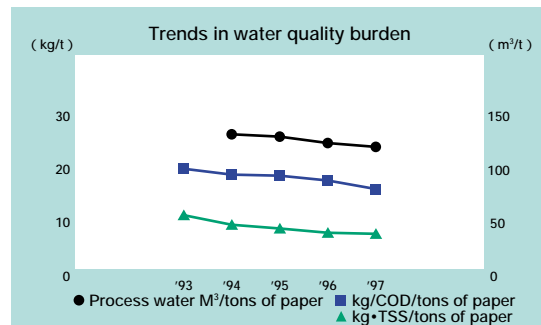
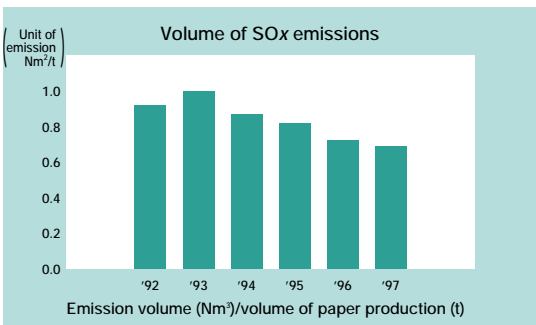
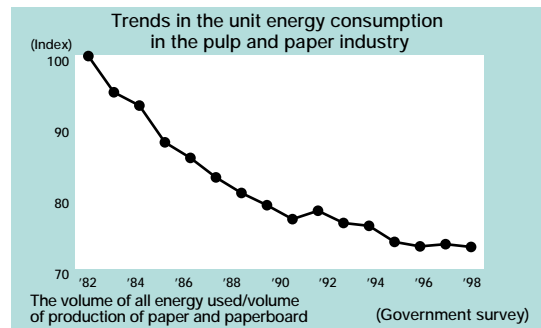
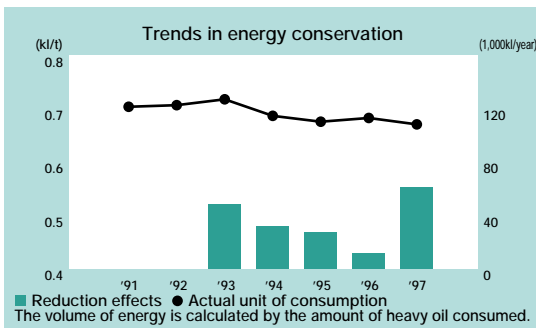
Energy conservation

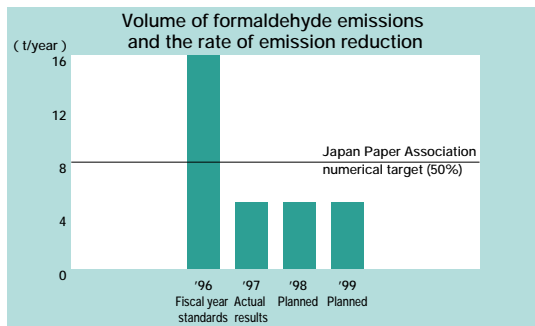
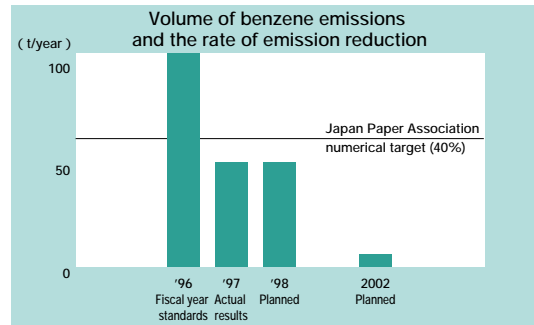
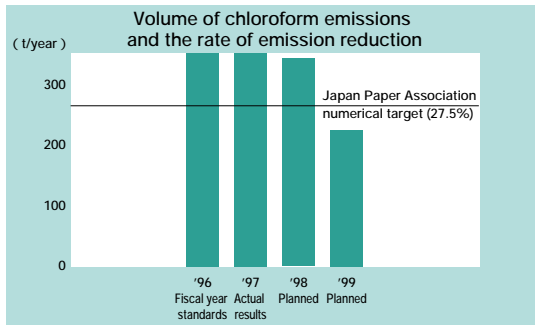
The two oil crises of the 1970s prompted the pulp and paper industry to take such measures as promoting energy conservation, effectively using self-supplied energy, and raising the percentage of usage of in-house-generated electricity. Looking at trends in energy consumption using an index with 1982 being 100, Nippon Paper Industries has achieved a remarkable improvement in unit energy consumption per product, with index values in recent years around the 73 range. Nevertheless, the Environmental Charter stipulates that the Company work to achieve a 7% improvement (a 3% reduction through improvements and the upgrading of processes as well as a 4% reduction through large-scale investments) in unit energy consumption per product compared with fiscal 1991 levels by fiscal 2000. Nippon Paper Industries has been working vigorously to achieve this target since 1993, the year the

charter was formulated. As of fiscal 1997, despite increased energy use because of higher production volumes and the implementation of various quality-related measures, improvements in the Company's unit energy consumption per product were virtually in accordance with targets.

Prevention of water pollution

Paper is formed using the wire cloth method, by which wood fibers are dissolved in large volumes of water and then formed into sheets on the surface of a wire cloth. In the process of converting wood to pulp and paper, such elements as suspended solids contained in wood fibers and chemical oxygen demand from wood extracts become effluent, which contaminates the water. To improve this situation, Nippon Paper Industries is implementing such measures as its Zero Discharge Campaign to counter environmental problems at their source while strengthening its effluent





treatment capabilities, which includes increasing and fortifying its biological treatment facilities.

Preventing air pollution

To reuse and circulate chemicals used in pulp production, pulp mills have such facilities as recovery boilers, power boilers, and waste material incinerators. Emissions of soot, dust, sulphur oxides (SO_x), and nitrogen oxides (NO_x) from stacks at mills are strictly governed in accordance with laws and ordinances.

To counter environmental problems at their source, Nippon Paper Industries is striving to reduce actual fuel consumption by converting to facilities with high electric power generation efficiency and promoting energy conservation at all mills, while implementing such processing measures as increasing and upgrading smoke emission treatment facilities.

Responding to new environmental problems

The paper manufacturing industry occasionally handles substances shown to have chronic toxicity and carcinogenic properties as well as chemical substances believed to disrupt the endocrine system in animals.

Nippon Paper Industries has implemented extensive measures to prevent the formation of dioxin. However, such hazardous air pollutants as chloroform are unintentionally produced during the pulp-bleaching process, and benzene is emitted from the Company's incinerators. Nippon Paper Industries also uses formaldehyde in a portion of its products. The Japan Paper Association plans to reduce emissions of these three substances 27.5%, 30%, and 50%, respectively, by March 2000. Furthermore, Nippon Paper Industries intends to lower its emission of these three substances to below industry levels and has already partially

reached its objectives.

Regarding substances that disrupt the endocrine system in animals, Nippon Paper Industries is carrying out a comprehensive inspection of all materials it uses to ascertain whether these materials contain such disruptive substances and attempting to find substitute products.

The Company's approach to obtaining ISO 14001 certification

Nippon Paper Industries is making Companywide efforts to obtain ISO 14001 certification at all its mills during fiscal 2000 and has already achieved significant progress in attaining this objective. To this end, ISO 14001 certification was obtained by the Yufutsu Mill in November 1998, the Fushiki Mill in January 1999, and the Higashimatsuyama Mill in March 1999. Preparations are on schedule for obtaining ISO 14001 certification at the Company's nine other mills during fiscal 1999.

In addition, the companies comprising the Nippon Paper Industries Group are also progressing with efforts to obtain ISO 14001 certification. At present, Tohoku Paper Co., Ltd., and Lintec Corporation are in the final stages of preparations while similar preparations are proceeding smoothly at Japan Paperboard Industries, Ltd., and Jujo Central Co., Ltd.

Nippon Paper Industries believes obtaining ISO 14001 certification requires responsible actions by each employee in terms of taking environmental impact into consideration when carrying out business operations and working to achieve continual improvements. The Company remains committed to carrying out its ISO 14001-related activities.



ISO 14001 certification for the Yufutsu Mill

Expanding the Applications of Wastepaper

Recycling

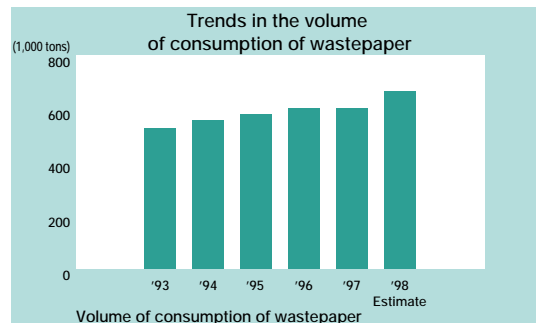
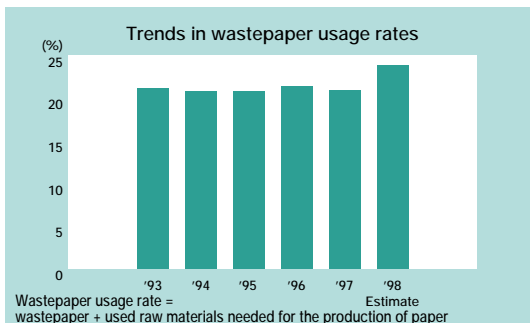


To expand the use of wastepaper is one Action Guideline in the Company's Environmental Charter. At present, Nippon Paper Industries aims to raise the DIP content of its newsprint to 70% while expanding the applications of wood-free wastepaper. In accordance with these objectives, Nippon Paper Industries is developing technologies for utilizing wastepaper and increasing and strengthening its DIP facilities. The Company's efforts are directed toward developing DIP technologies for producing pulp from wastepaper as well as developing paper manufacturing technologies that enable a high DIP content in paper.

The Company's investments for increasing and expanding paper recycling facilities are targeted at upgrading and raising the quality of DIP production facilities. Through these investments, Nippon Paper Industries will increase the amount of reusable wastepaper. The Company's capital investments to the present and planned investments for the future are shown in the graphs on page 20 of this report. The Company's wastepaper utilization rate in fiscal 1997

was 20.9% and is expected to reach 23.9% in fiscal 1998 and jump to 28% in fiscal 2000. The volume of the Company's reused wastepaper amounted to 600,000 tons in fiscal 1997 and is anticipated to soar an additional 220,000 tons, to 820,000 tons, by fiscal 2000.

On another front, Nippon Paper Industries is expanding and fortifying its production capabilities for recycled paper that has a high wastepaper content, primarily at the Ishinomaki and Fushiki mills. Besides recycled paper with a high wastepaper content, DIP has applications in many other types of paper. Therefore, the DIP facilities of paper manufacturing companies, including Nippon Paper Industries, are presently operating at full capacity. To expand the use of wastepaper, a crucial task will be to develop technologies enabling high rates of wastepaper content. Concurrently, increasing and expanding production facilities and using wastepaper for all types of paper will be imperative. From this perspective, Nippon Paper Industries remains committed to pursuing new applications for wastepaper.



Wastepaper Recycling System

