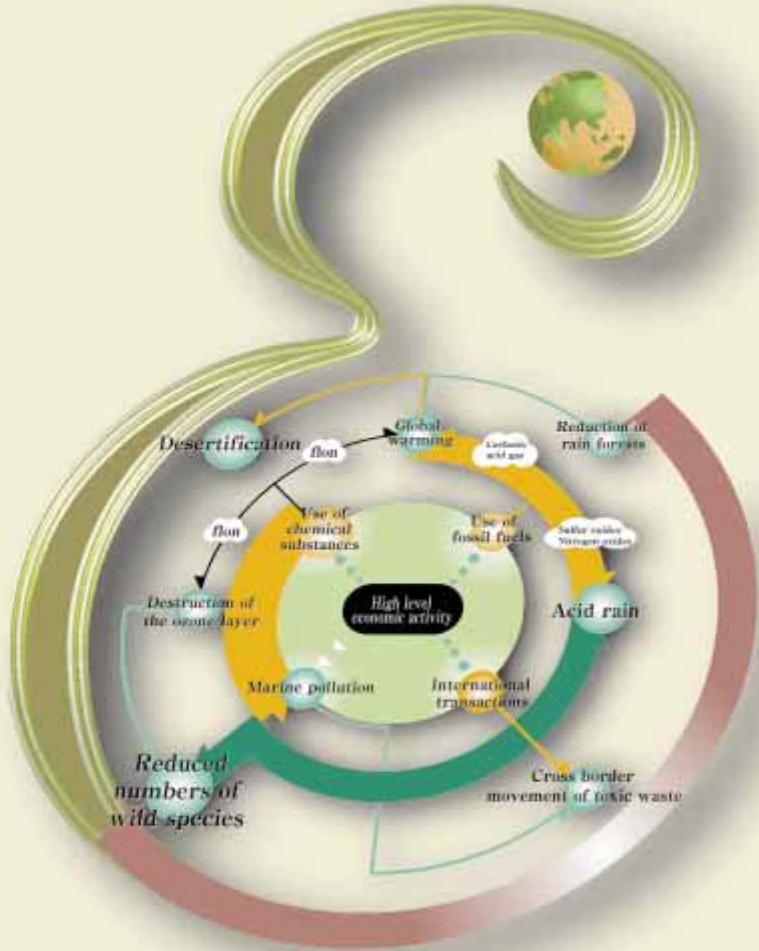


Environmental Report 2000

Toppan's Environmental Conservation Activities



Environmental Report 2000

Toppan's Environmental Conservation Activities

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Environmental Report 2000

Period covered

April 1, 1999, to March 31, 2000

*More recent data may be included for some key items.

Business sites covered

Head office, 4 office buildings, 2 research centers, and 46 plants in Japan

*The figure includes eighteen subsidiary plants.

*This report also includes in-house environmental audits conducted at several of our overseas plants.

*The four office buildings are located in Tokyo's Akihabara, Koishikawa, Shibaura, and Honjo areas.

History of the report

This is the third edition of Toppan's *Environmental Report*.

Next scheduled publication

September 2001 (to be published annually)

Department in charge of publication

Ecology Center, Corporate Manufacturing Technology & Research Division

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Corporate Profile

Corporate name

Toppan Printing Co., Ltd.

Head office

1 Kanda Izumi-cho, Chiyoda-ku, Tokyo

101-0024 Japan

Phone: +81-3-3835-5111

Established

January 17, 1900

President & CEO

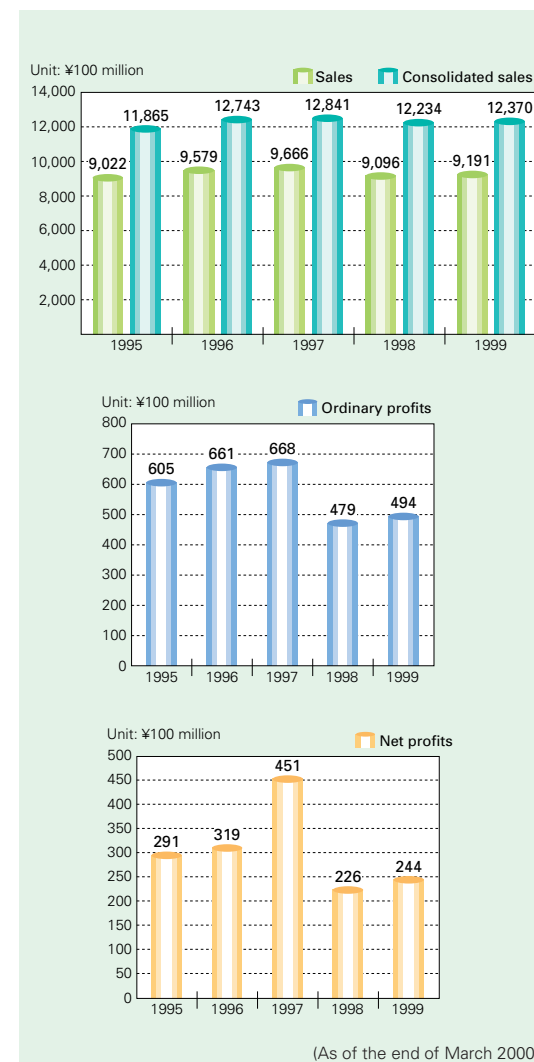
Naoki Adachi (Since June 29, 2000)

Number of employees

13,543

Capital

¥104,900 million



Business Fields

Securities and Cards

Printing and manufacturing of stock and bond certificates, checks, promissory notes, passbooks, general certificates, gift certificates, lottery tickets, cash cards, credit cards, prepaid cards, IC cards, vouchers, business forms, etc.; development, design, and sale of systems and equipment for security control.

Commercial Printing

Production of advertising and promotional materials such as catalogues, pamphlets, flyers, posters, calendars and point-of-purchase displays, yearbooks, corporate brochures and corporate chronicles, annual reports, various gift products, etc.; corporate identity planning; planning and production for various video media; space design as well as planning and conduct events; sales promotion planning; development of video media such as high-definition TV; three-dimensional printed products, etc.

Publications Printing

Planning, editing, and printing various types of magazines and books (regular, art, textbooks, etc.); planning and production of multimedia publications such as CD-ROMs and DVDs; negotiations for overseas copyrights, etc.

Packaging

Production and printing of paper products such as containers, packaging materials, and labels, packaging materials made of

plastic film, etc., paper-based liquid containers, plastic bottles; production and printing of cardboard products; design and manufacture of packaging-related systems and equipment; development of new materials; filling services, etc.

Industrial Materials

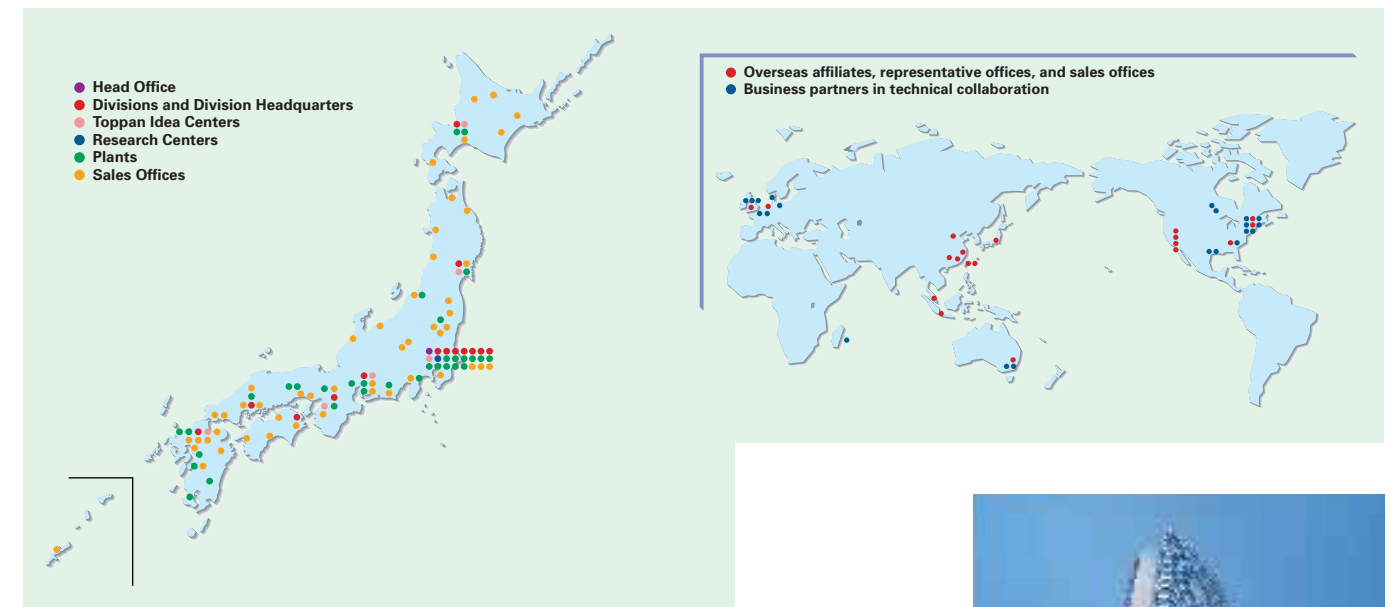
Production of decorative sheet products, wallpaper, floor materials, and interior and exterior materials; development of design patterns and new materials, interior decor material, transfer materials, processed sheets, etc.

Multimedia

Development of Internet technologies, including those relating to B-ISDN; planning and production of content; planning, production, and manufacture of CD-ROMs, DVDs, and VCDs; design and management of database and network systems; communication satellite broadcasting business; production of broadcasting programs; planning and production of various image media, etc.

Electronics

Production of electronics products such as photomasks, lead frames, printed wiring boards, LSI substrates for semiconductor packages, shadow masks, LCD color filters, materials for data-storage media, plastic moulds, reflective screens, functional films; design of LSI and printed wiring boards; development of software.



Business sites

Head office, 4 office buildings, 2 research centers, and 46 plants (including 18 subsidiary plants)

Consolidated subsidiaries

116

Environmental organizations affiliated with Toppan Printing

- RPF Study Group, Paper Recycling Promotion Center
- Green Purchasing Network
- UNU Zero Emissions Forum
- Japan LCA Forum
- ECOMATERIALS Forum, The Society of Non-traditional Technology
- Environmental Study Group, Japan Environment Association
- Network for Environmental Reporting
- Study Group on Practical Matters about Introducing Environmental Accounting
- Aluminum Project, Liquid Carton Section, Printers' Association of Japan
- The Association for Collecting and Recycling
- World Wildlife Fund Japan (WWF)
- Japan Ecology Foundation
- Others



The Toppan Koishikawa Building was completed in May 2000. Designed to serve as a base for information networking businesses, the building is fully equipped with functions for distributing and collecting information. In keeping with our commitment to the enrichment of culture and society, the building also houses the Printing Museum, Tokyo; a concert hall; and other cultural facilities.

Message from the President

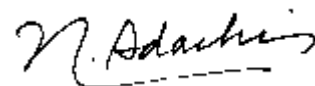
This year, we celebrated the 100th anniversary of the founding of Toppan Printing Co., Ltd. Designating the year 2000 as our “second renaissance,” we have established a new corporate structure for the 21st century, defining the all-important values and sense of purpose that we want all of our employees to share. Toppan’s corporate image consists of a corporate philosophy, corporate creed, and conduct guidelines, all of which reflect the awareness of our social responsibility as a corporate citizen and our emphasis on pursuing our corporate activities in harmony with the global environment, adherence to corporate ethics, and fair information disclosure.

Toppan established its Declaration on the Global Environment in 1992 to serve as our fundamental philosophy toward the environment. In accordance with the declaration’s general concept of “eco-protection,” we have practiced a number of environmental measures to promote environmental conservation in production. Additionally, the concept of “eco-creativity” lends assistance to general environmental activities, including the research and development of environmentally preferable products.

Global environmental concerns have, of course, become an important issue of corporate management. Furthermore, as part of a recycling-oriented society, we are vigorously promoting our environmental management practices through the community-oriented principles of our corporate philosophy and creed. To make sustainable progress an integral feature of our corporate activities, we are endeavoring to reduce the environmental burden caused by our production processes by implementing IT (information technologies) and developing environmentally preferable products, especially in our living environment-related operations.

We sincerely hope that our customers and as many other people as possible will read this report to learn about Toppan’s policy and corporate practices in environmental conservation.

Naoki Adachi
President & CEO



Reducing Our Environmental Burden

The global environment—including conservation of energy and the Earth’s other precious resources—has gained prominence as an issue of crucial importance. For society to grow in a sustainable manner, today’s corporations must face these issues and act to resolve them.

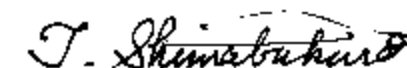
The promotion of environmental measures, as specified in our new corporate creed and conduct guidelines, means not only the fulfillment of our social responsibility but also the increase in our overall corporate value. Together with the principles of environmental accounting, we believe that the introduction and implementation of ISO 14001—the world’s standard for environmental management—will play an important role in reducing the burden today’s corporations place on the environment. We also believe that the continuous practice of these activities will bring new efficiency to daily business management.

Following one plant in our electronics operations, another plant in our living-environment operations for the printing of industrial materials became the first facility of its kind in 1999 to obtain ISO 14001 certification. In fact, this was the first such certification for a plant in the industry. Furthermore, through the adoption of new technologies and collaboration with other companies, we achieved a reduction in the amount of land-fill disposal at each plant.

From this point forward, Toppan will implement activities designed to reduce our environmental burden. We will do so by considering the environment during product development and design, utilizing IT (information technologies) in production processes, and promoting the development of new technologies to help preserve the environment.

This report is a summary of Toppan’s environmental conservation activities in fiscal 1999. We would greatly appreciate any comments or suggestions you may have regarding this publication.

Tohru Shimabukuro
Chief Environmental Manager and
Senior Managing Director



Toppan and the Environment

The degree of environmental burden varies with each operation in which Toppan is involved. A printing operation can, of course, potentially deplete resources and increase forest logging and acid rain, all of which result from the use of processed materials such as paper, ink, and resin, as well as from the use of raw materials and fuel consumption in manufacturing processes. Global warming and depletion of the ozone layer are related issues, being caused by the use of chemical substances and the emission of CO₂ from energy consumption in production processes. Moreover, the quality of the atmosphere, water, and soil is also affected, and waste generated in manufacturing operations—not to mention the waste accumulation of used products—could lead to serious environmental repercussions.

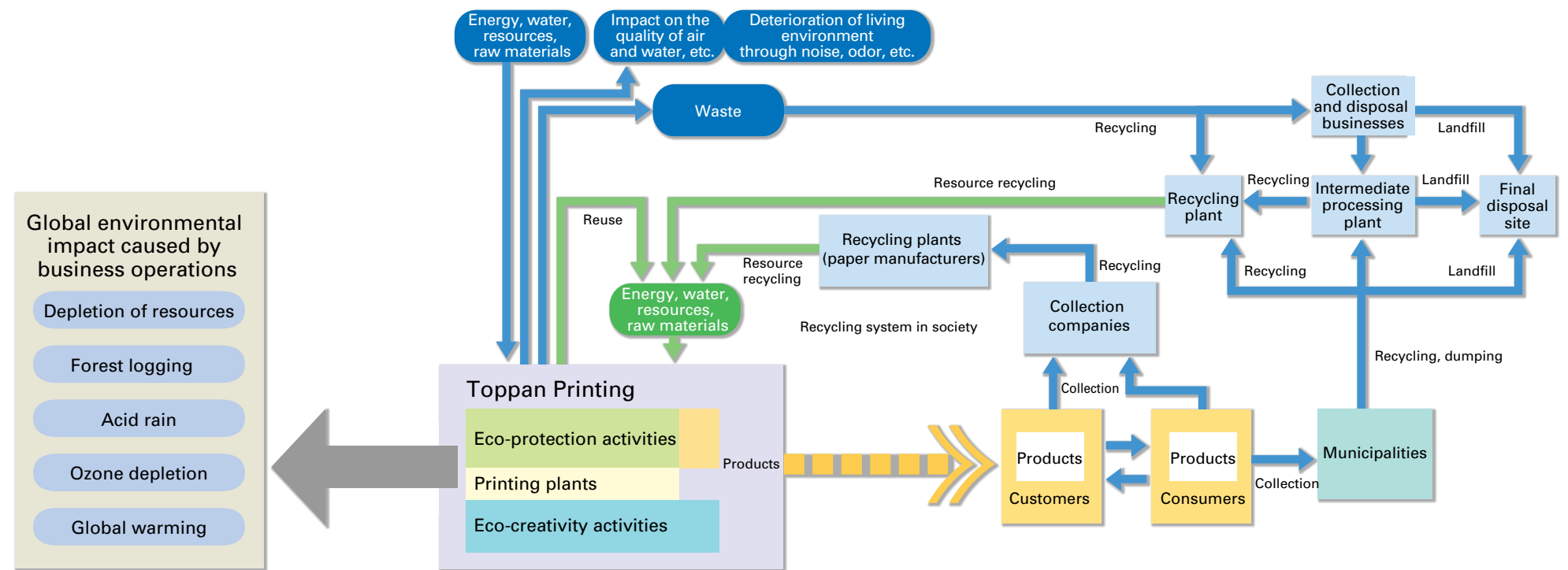
Toppan is therefore promoting environment conservation with emphasis on two

major endeavors: eco-protection and eco-creativity activities. The term “eco-protection” refers to environmental conservation on the production front. Specifically, it aims to control exhaust gases and wastewater, utilize resources effectively, and reduce energy consumption and the amount of waste generation. There are ongoing efforts encompassed within the management, reduction, and substitution of chemical substances and utilization of waste as a recyclable resource.

The term “eco-creativity” refers to constructive activities for environmental conservation such as the initiative of relevant divisions (division headquarters) to general outside activities with respect to conservation of the environment, including the research and development of environmentally preferable products.

We at Toppan Printing are actively promoting our environmental conservation activities through key partnerships with other businesses, including our customers, consumers, municipalities, NGOs, and NPOs, in order to assist in the prosperity of a modern recycling-oriented society. (See page 28.)

Basic flow: Printing and environmental protection

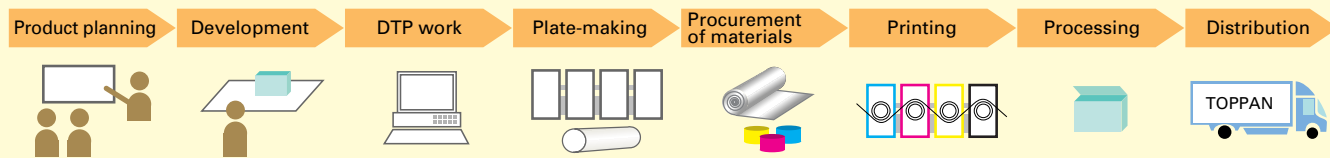


Environmental Management

Environmental Management System → p. 12

Environment conservation in production: Eco-protection activities

- Prevention of Pollution → p. 14
- Energy and Resource Savings → p. 18
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- Management of Chemical Substances → p. 15
- Office Eco-protection → p. 20
- “Green Purchasing” → p. 21
- Collection and Recycling of Solvents → p. 14
- Efforts in Product Distribution → p. 22



Establishment of Principles and Standards for Environmentally Preferable Products/Toppan’s Labels for Environmentally Preferable Products → p. 24

Evaluating Environmental Impact → p. 25

Development of Environmentally Preferable Products → p. 27

Proposals for Environmentally Preferable Materials → p. 27

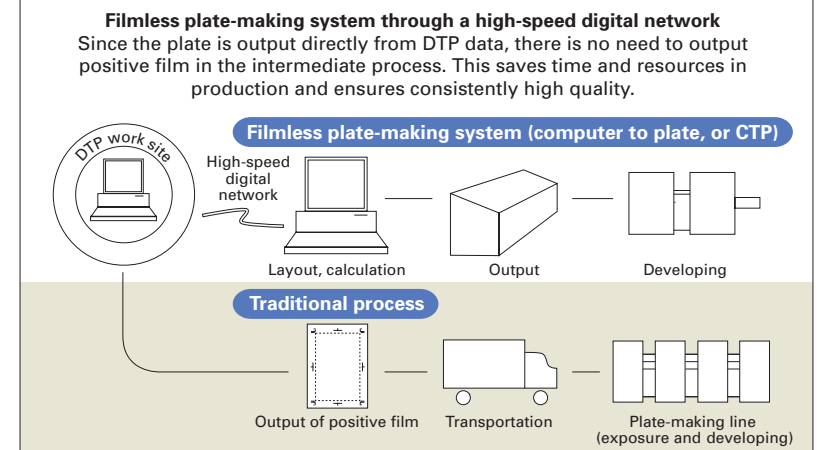
Environment conservation in product development: Eco-creativity activities

Communication

- Educational and Awareness-raising Activities → p. 29
- Information Disclosure and Communication → p. 30
- Social Contributions and Outside Activities → p. 31
- Environmental Accounting → p. 32

Creating a System for Recycling → p. 28

CTP (Computer to Plate) Process



DTP: An acronym for “desktop publishing,” it refers to an environment in which one personal computer is used to edit text, photographs, line art, and graphs for the production of final prints. The process has recently expanded to encompass the desktop prepress process.

CTP: An acronym for “computer to plate,” it refers to a filmless plate-making system that employs a high-speed digital network. Since the plate is output directly from DTP data, there is no need to output positive film in the intermediate process. This saves time and resources in production and ensures consistently high quality.

Toppan's Environmental Philosophy

The 1990s brought forth an increased number of critical issues for business and industry, concurrent with the surge in worldwide environmental conservation. This was reflected in Toppan's 1991 establishment of the Ecology Center, subsequent to the

restructuring of our environmental conservation activities, which had previously emphasized pollution prevention as overseen by the Department of Environmental Management at the head office. Additionally, we established our Declaration on the Global Environment in April 1992 as a basic philosophy to govern our efforts on behalf of environmental conservation. That document enumerated six items of declaration, as well as the "Environmental Action Plan Through Corporate Activity" and "Every Employee's Environmental Action Plan" for the realization of that philosophy.

In anticipation of our 100th anniversary in June 2000, we clarified our thinking regarding the environment in the context of business management and re-evaluated our Declaration on the Global Environment. This in turn led to the establishment of our corporate philosophy, corporate creed, and conduct guidelines. Thus, as we stand at the threshold of the 21st century, we will fully apply ourselves to the promotion of environment conservation and encourage the participation of all Toppan employees.

Corporate Philosophy

Each of us shall reciprocate our customers' continued trust, create dedicated products by harnessing our vibrant knowledge and technology, and contribute to a fulfilling lifestyle as a mainstay of information and culture.

Corporate Creed

To build our customers' trust through sincerity, enthusiasm, and creativity in all our corporate endeavors.

To strive for total innovation from a global perspective by conducting marketing and technological development rich in originality.

To conduct fair and open business operations while acknowledging our social responsibilities and aspiring for harmony with our global environment.

To create a positive working environment by maximizing our individual talents and strength as a team.

To enhance our corporate standing and promote the continual development of the Toppan group through the exploration of new possibilities.

Conduct Guidelines (excerpted from chapter 2)

Safety and care for the environment

Toppan is an energetic promoter of living environment in a global scale. Accordingly, we work hard to prevent environmental pollution, strictly observing each regulation associated with that issue. Moreover, we work to save precious resources and energy, and to implement corporate recycling activities. Toppan will continue its dedication to the prevention of environmental pollution. Careful attention to the environment is the expression of our consideration for the earth.

Toppan's Declaration on the Global Environment

Foreword

Numerous issues concerning global environmental disruption have significantly affected world politics, the economy, and the global society in recent years, concurrent with the rise of global commerce. It is therefore critical that each of us should make a personal pledge concerning these issues so that future generations may enjoy the blessings of a clean planet.

Toppan contributes to society through its corporate activities, pursuing our self-definition as an "Information and lifestyle-related industry rooted in culture." Accordingly, we will continue to develop measures that address global environmental issues, in order to fulfill our social responsibility as a corporate citizen.

Declaration

1. Each of our employees recognizes the importance of global environmental issues and endeavors to conserve the global environment.
2. We actively promote energy/resource conservation and recycling as a means of conserving the global environment.
3. We abide by the laws and social order, striving to prevent environmental pollution.
4. Through our business operations, we actively support our customers' activities to conserve the global environment.
5. In our research, we endeavor to develop products and technologies that help conserve the global environment.
6. We implement corporate activities designed to further global conservation in the context of international society.

Environmental Action Plan → See pages 8 and 9.

We have set corresponding environmental targets for the six items of declaration listed in our Declaration on the Global Environment, and are fully engaged in its realization.

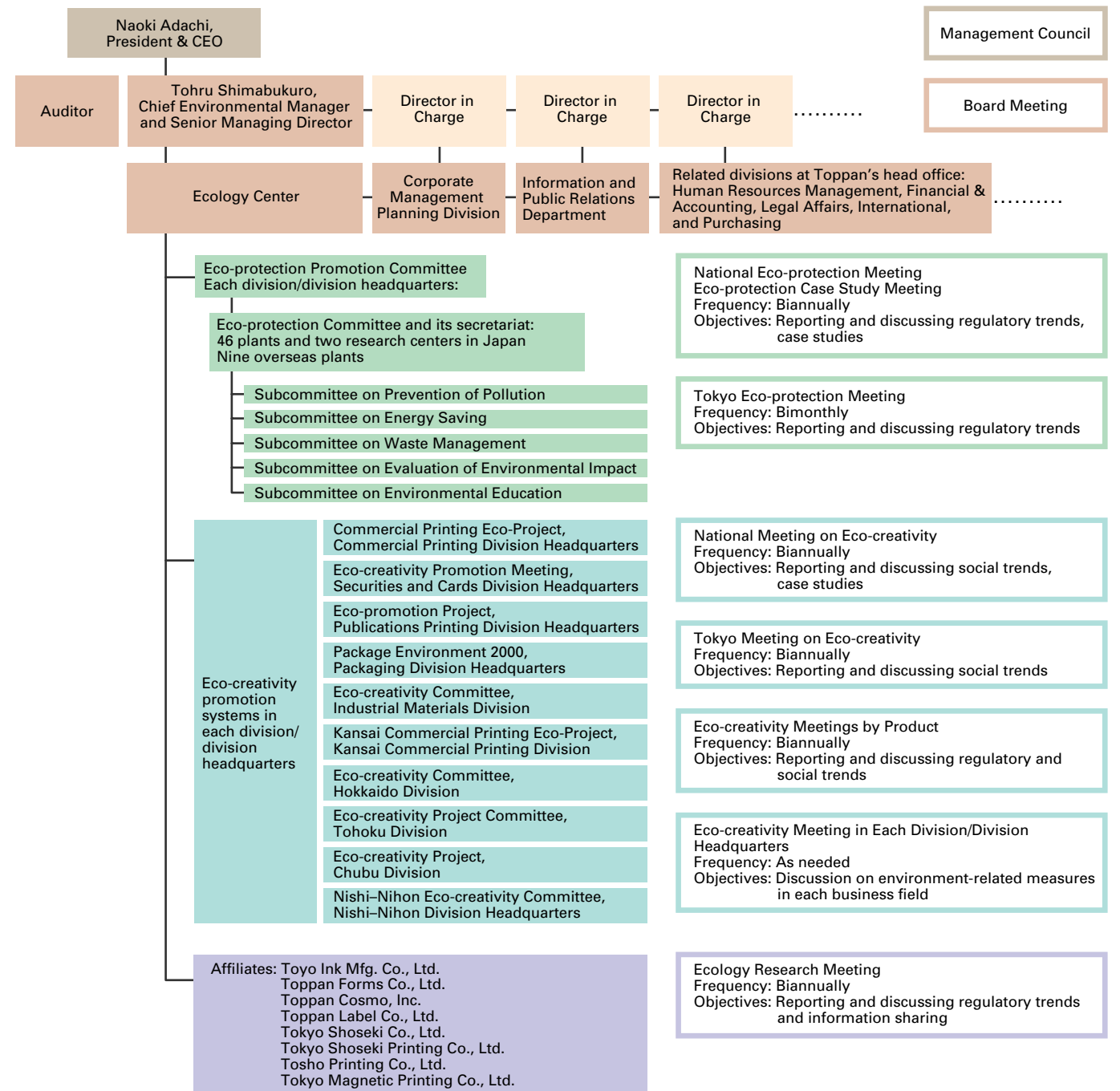
Environmental Targets

→ See pages 9 to 11.

Environmental Management Structure and System

Toppan's structure of environmental management consists of "national eco-protection promotion committees" and "national eco-creativity promotion systems," which encompass the two areas of activity heretofore described. Each is controlled by the Ecology Center under the supervision of the chief environmental manager. Currently, 46 plants and two research centers in Japan, as well as nine overseas plants, have established a promotion committee for eco-protection activities. Moreover, ten divisions (division headquarters) nationwide have set up a promotion system for activities relating to eco-creativity. The role of the Ecology Center is to determine the corporate direction as a pivot point for all activities via the periodic issuance of executive reports, as well as by leading and assisting each committee and system, distributing and collecting information, organizing national meetings, among others.

Environmental management structure for fiscal 2000

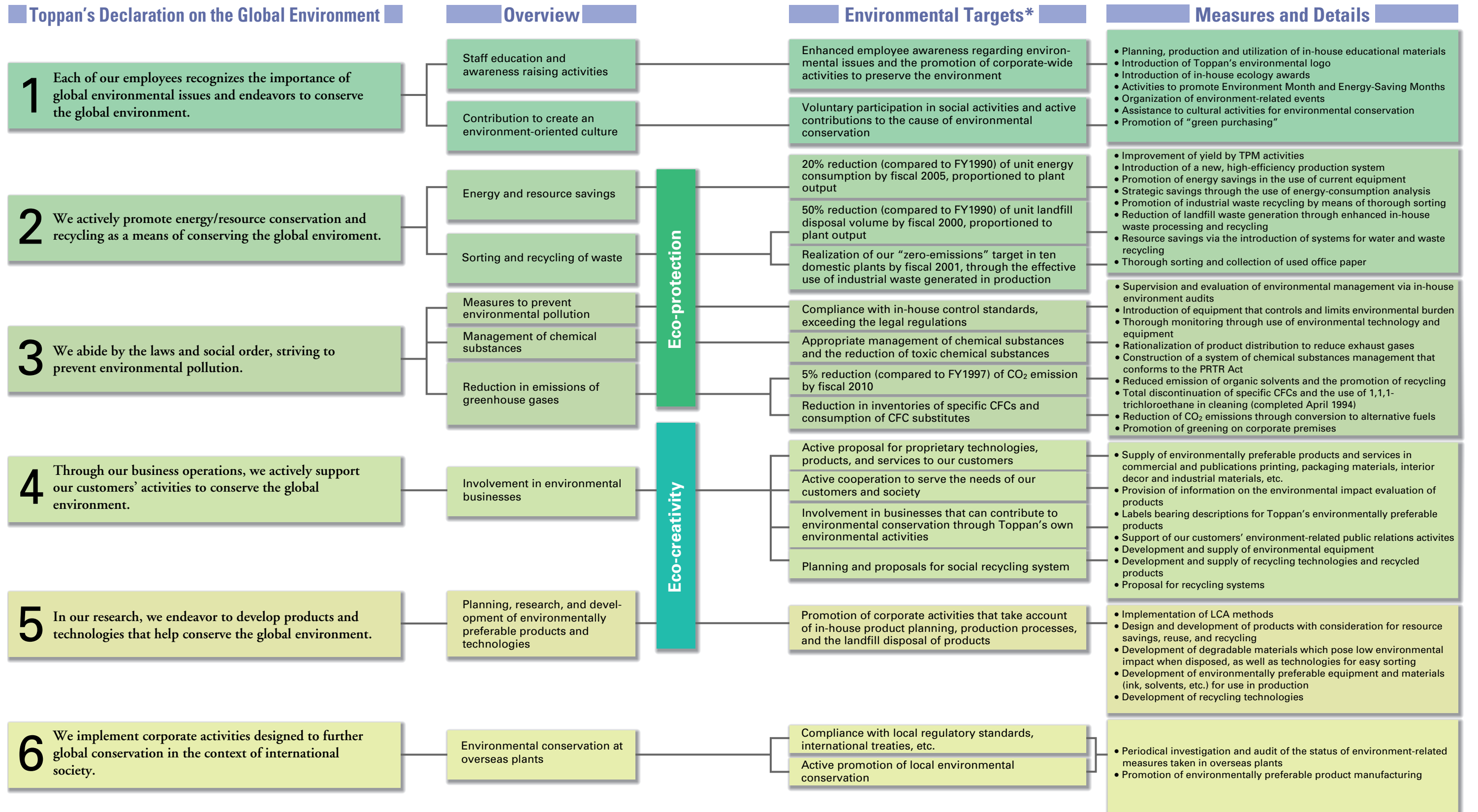


Environmental Action Plan

We have set corresponding environmental targets for the six items of declaration listed in

our Declaration on the Global Environment, and are fully engaged in its realization.

Prepared April 1, 1992
Third edition issued July 1, 2000



*Toppan periodically reviews these environmental targets in accordance with trends in overall environmental conservation. (The latest targets are published in the Environmental Report.)

Environmental Targets and Achievements for Fiscal 1999

Toppan is promoting environmental conservation activities in accordance with the targets set forth in our Declaration on the Global Environment and Environmental Action Plan. Our business sites (plants and research centers) in Japan are engaged in an environmental management system, having set up an environmental policy, objectives,

and targets in accordance with actual conditions, based on the "environmental indexes" established to monitor our eco-protection activities. The following is a summary of our progress and achievements toward these targets in fiscal 1999. More detailed descriptions are given in another section.

Environmental targets (second revision)	Progress and achievements for fiscal 1999
Enhanced employee awareness regarding environmental issues and the promotion of corporate-wide activities to preserve the environment	Introduction of Toppan's environmental logo
Voluntary participation in social activities and active contributions to the cause of environmental conservation	¥2.87 million donation to "Global Citizens' Forest" for tree planting
20% reduction (compared to FY1990) of unit energy consumption by fiscal 2005, proportioned to plant output	A 13.5% increase compared to fiscal 1990 level
With the yearly volume of waste generation falling below the rate of output increase, 50% reduction (compared to FY1990) of unit landfill disposal volume by fiscal 2000	A 38.6% reduction compared to fiscal 1990 level
Compliance with in-house control standards, including legal regulations	Compliance with in-house control standards
Appropriate management of chemical substances and the reduction of toxic chemical substances	Emissions of dichloromethane into the air: 11.5% reduction compared to the previous fiscal year
Reduction of CFC substitutes consumption and CO ₂ emission	Switch from liquid fuel to gaseous fuel: two plants
Active cooperation to serve the needs of our customers and society Active proposals for proprietary technologies and product developments	New development and proposals for environmentally preferable products: five cases
Participation in businesses that can contribute to environmental conservation, through Toppan's own activities Planning and proposals for social recycling system	Continuous implementation of a recycling system for printed materials
Promotion of corporate activities that take account of in-house product planning, production processes, and the landfill disposal of products	Establishment of product principles and standards for environmental issues
Compliance with local regulatory standards, international treaties, etc. Active promotion of local environmental conservation activities	Implementation of internal environmental audits at overseas plants: three in the U.S.



Environmental Targets for Fiscal 2000

The third revision of Toppan's Declaration on the Global Environment and Environmental Action Plan, was made on the occasion of our 100th anniversary, reiterates and expands the company's corporate philosophy, corporate creed, and conduct guideline. Moreover, we will be setting yearly targets for our environmental efforts, being

positioned as mid- to long-term plans, and shall promote activities to proactively achieve targets. We have also decided to revise our environmental indexes, which were in use until the previous fiscal year. These will be included in the annual environmental targets for all of Toppan's business sites.

Environmental targets	Environmental targets for fiscal 2000
Enhanced employee awareness regarding environmental issues and the promotion of corporate-wide activities to preserve the environment	Dissemination of Toppan's environmental logo
Voluntary participation in social activities and active contributions to the cause of environmental conservation	Participation in tree-planting activities
20% reduction (compared to FY1990) of unit energy consumption by fiscal 2005, proportioned to plant output	A 10% reduction compared to the previous fiscal year
50% reduction (compared to FY1990) of unit landfill disposal volume by fiscal 2000, proportioned to plant output	A 50% reduction compared to the fiscal 1990 level
Realization of our "zero-emissions" target at ten domestic plants by fiscal 2001, through the effective use of industrial waste generated in production	Realization of zero-emission plants: one plant
Compliance with in-house control standards, including legal regulations	Compliance with in-house control standards
Appropriate management of chemical substances and the reduction of toxic chemical substances	Emissions of dichloromethane into the air: 15% reduction compared to the previous fiscal year
5% reduction (compared to FY1997) of CO ₂ emission by fiscal 2010	Maintenance of the fiscal 1999 level
Reduction in inventories of specific CFCs and consumption of CFC substitutes	Replacement of freezers using specific CFCs: eight units
Active proposals for proprietary technologies, products, and services	New developments and proposals for environmentally preferable products: five cases
Active cooperation to serve the needs of our customers and society	Supply of environment-related information, including product evaluations
Participation in businesses that can contribute to environmental conservation, through Toppan's own activities	Research into new methods of recycling
Planning and proposals for social recycling system	Continued operation of a recycling system for printed materials
Promotion of corporate activities that take account of in-house product planning, production processes, and the landfill disposal of products	Establishment of action plans, principles, and standards for the development of environmentally preferable products
Compliance with local regulatory standards, international treaties, etc.	Implementation of in-house environmental audits at overseas plants: six in Asia
Active promotion of local environmental conservation activities	Active promotion of local environmental conservation activities

Environmental indexes

Prevention of pollution	Comprehension of the actual status of environmental burden through evaluating environmental impact
	Establishment and compliance with in-house control standards that exceed the regulatory standards
	Efforts toward the responsible management of chemical substances and the reduction of toxic chemical substances
Waste management	A 50% reduction in unit landfill disposal volume by fiscal 2000, compared to the fiscal 1990 figures
Rationalization of energy consumption	A 20% reduction in unit energy consumption of electricity and heat by fiscal 2005, compared to the fiscal 1990 figures
Eco-protection in the office	A 75% recycling rate of used office paper by fiscal 2000
	Promotion of effective use of rainwater
	Purchase of designated goods based on Toppan's in-house standards for "green purchasing"

Environmental Management System

ISO 14001 and In-house Environmental Audit

ISO 14001, an international standard of certification for environmental management systems, was published in September 1996. However, Toppan has for the past nine years been phasing in an environmental management system at each of its business sites in Japan (plants and research centers), in a pursuit for ISO certification. Currently our management system has completed nearly all the requirements of JIS Q 14001:1996, and we are finalizing the arrangements on our corporate system that will be eligible for ISO 14001 certification.

Management cycle

Toppan's environmental management system first deals with daily environmental conservation activities, in accordance with the *Environmental Policy* and the *Environmental Objectives and Targets* and *Environmental Activity Plan*, as established by each business site, based on Toppan's Declaration on the Global Environment and the Environmental Action Plan. Once we fully comprehend the results and revise our actual achievements for the year, we proceed to plan policies, objectives, targets, and actions for the next year, thus completing the entire cycle in our system of management. Moreover, Toppan's environmental targets are subject to revision in accordance with the annual *Environmental Achievement Report*, which each plant is obliged to submit to the head office at the end of the year.

In-house environmental audit system

Toppan's in-house environmental auditing system comprises a document audit and an on-site audit, which are conducted annually at all plants by staff from the head office (auditors of the company and an environmental management system provisional auditors) along with "in-house environmental auditors" trained in-house. The system is designed to confirm and evaluate the state of compliance with our own standards, as

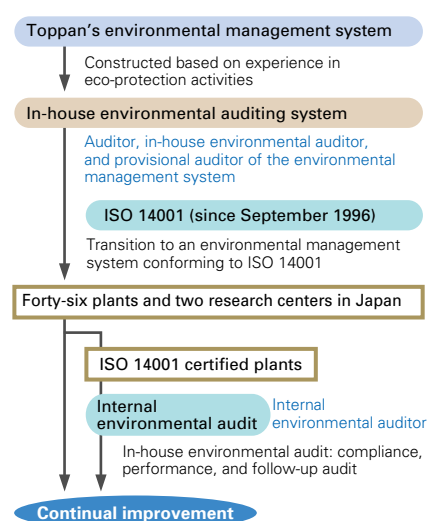
well as legal regulations and the progress of system construction. Additionally, reviews of the in-house environmental audits are conducted within the same fiscal year in order to monitor progress and give appropriate guidance concerning issues of improvement pointed out at the audit.

Toppan's plants in Asia and the U.S. promote improvement activities through on-site hearings and inspections every two years, along with a document-based examination in the intervening year.



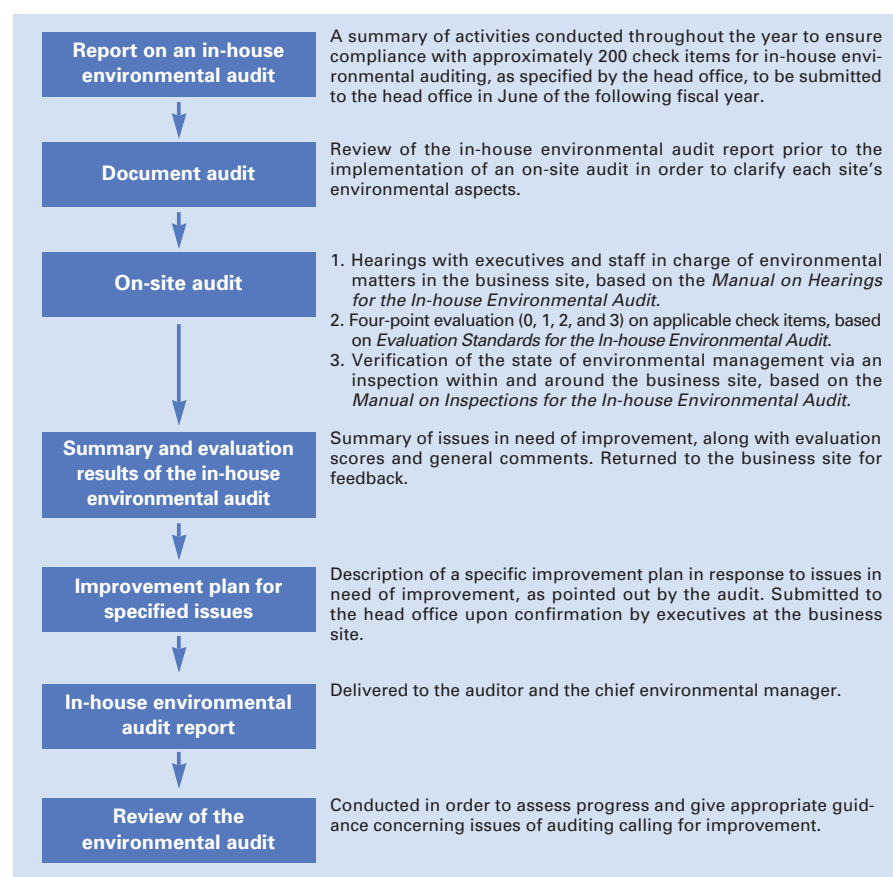
In-house environmental audit hearing at the Sakado plant

In-house environmental audit and internal audit



Inspection for in-house environmental audit at the New Jersey plant

Structure of an in-house environmental audit



Report on the results from FY1999

According to the results of our in-house audits for fiscal 1999, unit energy consumption proportioned to plant output, increased by 8.5% over the preceding fiscal year. Principal causes for the increase include the decrease in unit price due to the Japanese stagnant economy and increased energy consumption due to the establishment of new plants. It was therefore necessary for us to conduct a fundamental review of the structure of each energy consumption control system and the targets therein established. With regard to the status of other management systems and operations, there were 278 significant cases in need of improvement. The reports, together with evaluation scores and general comments from the audit, were returned to executives in each business site as feedback, requiring them to submit improvement plans. The progress toward improvement of 141 cases at ten business sites was checked in environmental audit reviews in fiscal 1999, and the remaining 137 cases will be checked in the environmental audits of fiscal 2000.

Outside Japan, on-site audits were conducted at three U.S. plants in San Diego, Atlanta, and New Jersey, as a means of determining the status of environmental management and operations. No significant issues in need of improvement were found.

Status of ISO 14001 certification

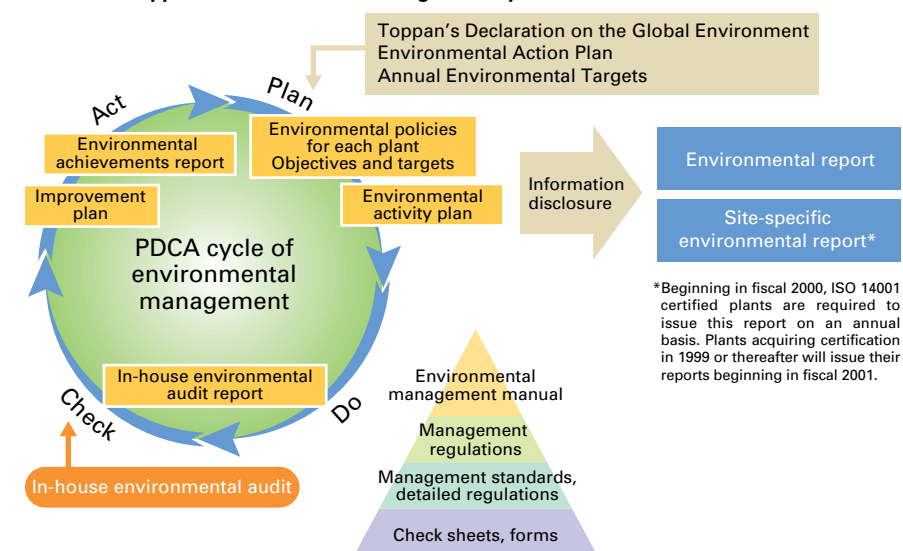
In March 2000, the Satte plant (Industrial Materials Division) was the first in the wall-paper gravure-printing industry to achieve ISO 14001 certification. Then, in April 2000, the Niigata plant (Electronics Division Headquarters) obtained certification, followed by the Kashiwa plant (Industrial Materials Division) in May. Currently the total number of ISO-certified plants is five, and three other facilities are working toward certification.

Achievements and plans regarding ISO 14001 certification

(as of May 31, 2000)

	Division	Plant	Main products	Registrar	Registration date
Achievement	Electronics	Shiga	Electronics products	JQA	July 1998
	Electronics	Kumamoto	Electronics products	JQA	November 1998
	Industrial Material	Satte	Wallpaper, decorative sheets	JQA	March 2000
	Electronics	Niigata	Electronics products	JQA	April 2000
	Industrial Material	Kashiwa	Decorative paper, decorative sheets	JQA	May 2000
Plan	Three plants in Japan are preparing for ISO certification assessment by March 2001.				

Outline of Toppan's environmental management system



*Beginning in fiscal 2000, ISO 14001 certified plants are required to issue this report on an annual basis. Plants acquiring certification in 1999 or thereafter will issue their reports beginning in fiscal 2001.



Satte plant (industrial materials)



Niigata plant (electronics)



Kashiwa plant (industrial materials)

Information sharing and disclosure

Environmental activity reports and data on energy, waste, and other environment-related issues are submitted by our business sites for data collection and analysis at the end of each fiscal year. Later, they are evaluated and discussed at the National Eco-Protection Meeting held in the first half of the following fiscal year. If there are measures found to be particularly effective, they are reported at the Eco-Protection Case Study Meeting so that other business sites can receive the benefits of those successful initiatives.

The collected data is summarized in the *Environmental Report* in order that our environmental data may be disclosed outside Toppan. Moreover, beginning fiscal 2000, we have made it a requirement for our ISO 14001 certified plants to prepare site-specific Environmental reports so that the information can be made available to local municipalities and residents.

Registered internal environmental auditors

(as of May 31, 2000)

Positions	Personnel
Managers	33
Supervisors	17
Employees	8
Total	58

Prevention of Pollution

Compliance with Legal Regulations and In-house Control Standards

Toppan keeps track of the status of the environmental burden generated by each of its plants by evaluating the environmental impact of their production activities. To reduce the environmental burden clarified through these evaluations and to prevent pollution therefrom, the Eco-Protection Promotion Committee at each plant establishes in-house control standards exceeding the legal regulations and works to maintain those values. The status of plant management and operations is then checked through a process of hearings and on-site inspections of the in-house environmental audit, and its results are used to ensure continual improvement over the course of the next fiscal year.

controlling air pollution through the introduction of electrostatic precipitators, bag filters, and other control machinery.

We also collect and reuse the organic solvents from the printing process in order to prevent them from being released into the air. In the process, we are able to use our own resources more efficiently. Moreover, the volatile chemical substances that would otherwise be released into the air during production are dissolved in water through

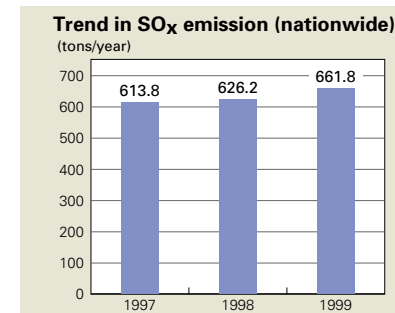
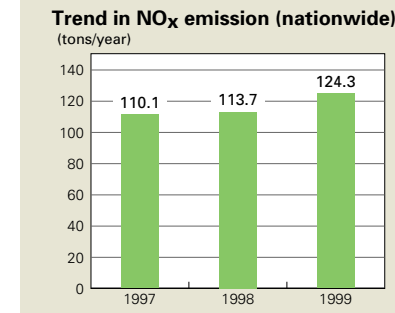


Collecting and recycling equipment for organic solvents



Scrubber

use of a scrubber. Through the proper treatment of this water, we control their release to the air and public water system.



Methods of calculation: The NO_x emission volume was calculated using the NO_x emission index set forth in the Environmental Agency's "Environmental Activity Evaluation Program," as issued in September 1999. The SO_x emission volume was calculated by converting the sulfur (S) in each used fuel to SO₂.

Results of air-quality measurement (June 1999, Shiga plant)

Item	Sulfur oxide (SO _x) volume [Nm ³ /h]			Nitrogen oxide (NO _x) concentration [ppm]			Soot volume [g/Nm ³]			
	Regulation	In-house standard	Measurement	Regulation	In-house standard	Measurement	Regulation	In-house standard	Measurement	
Boiler	T-1	1.07	0.1	<0.0032	260	100	89	0.3	0.01	0.0032
	T-2	1.02	0.1	<0.0023	260	100	81	0.3	0.01	0.0026
	T-3	1.03	0.1	<0.0026	260	100	98	0.3	0.01	0.0016
	T-4	1.03	0.1	<0.0025	260	100	97	0.3	0.01	0.0020
	T-5	1.05	0.1	<0.0030	260	100	95	0.3	0.01	0.0028

Prevention of air pollution

Facilities equipped with boilers or incinerators that generate smoke and soot are subject to concerted effort, wherein we endeavor to reduce environmental burden by converting to alternative fuels, controlling machine operations, observing appropriate combustion requirements, and strictly

Results of water-quality measurement (FY1999, Shiga plant)

Item	Regulation				In-house standard	Measurement (average)
	Legal regulation	Prefectural ordinance	Municipal ordinance	Agreed value		
Hydrogen ion concentration (pH)	5.8-8.6	6.0-8.5	6.0-8.5	-	6.0-8.0	7.0
Biochemical oxygen demand (BOD)	160 (daily average: 120)	20 (new plants: 15)	20	20	12	6.0
Chemical oxygen demand (COD)	160 (daily average: 120)	20 (new plants: 15)	20	20	12	8.5
Suspended substances (SS)	200 (daily average: 150)	70	30	20	12	2.7
Extractive substances in n-hexane (mineral oils)	5.0	5.0	5.0	3.0	2.0	0.7
Total chromium	2.0	0.1	0.1	0.1	0.06	0.04
Copper	3.0	1.0	1.0	-	0.2	0.02
Zinc	5.0	1.0	1.0	-	0.2	0.02
Soluble iron	10	10	10	-	1.0	0.30
Soluble manganese	10	10	10	-	1.0	0.18
Total phosphorus	16 (daily average: 8)	0.8 (new plants: 0.5)	-	-	0.4	0.2
Nitrates	120 (daily average: 60)	8.0	-	-	5.0	2.8
Cadmium	0.1	0.01	0.01	-	Not detected	Not detected <0.05
Cyanide	1.0	0.1	0.1	-	Not detected	Not detected <0.01
Organophosphorus compounds	1.0	Not detected	Not detected	-	Not detected	Not detected
Lead	0.1	0.1	0.1	-	Not detected	Not detected <0.05
Chromium (VI)	0.5	0.05	0.05	0.05	0.05	Not detected <0.01
Arsenic	0.1	0.05	0.05	-	Not detected	Not detected <0.01
Mercury	0.005	0.005	0.005	-	Not detected	Not detected <0.0005
1,1,1-trichloroethane	3.0	3.0	-	-	0.01	Not detected <0.001
Trichloroethylene	0.3	0.3	-	-	0.018	0.001
Tetrachloroethylene	0.1	0.1	-	-	0.006	Not detected <0.001
Carbon tetrachloride	0.02	0.02	-	-	Not detected	Not detected <0.001

[Unit: mg/l]

Prevention of water pollution

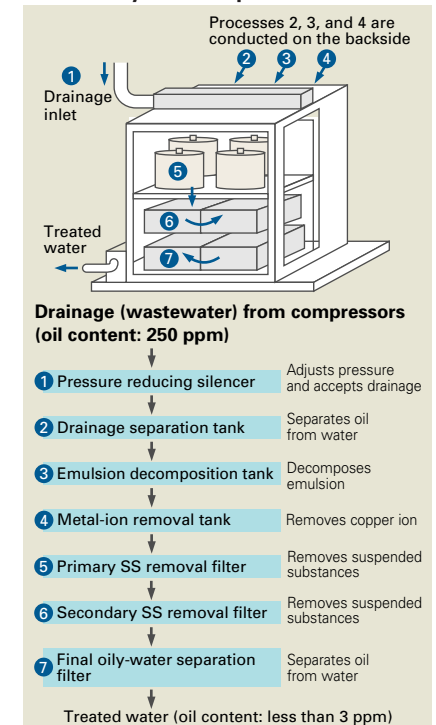
Toppan endeavors to prevent water pollution at its plants by establishing facilities to treat wastewater in proportion to its environmental burden imposed by production processes. To monitor the compliance status of the in-house control standards, we are now in the process of introducing a 24-hour monitoring system for treatment facilities in response to changes in BOD and COD values according to the seasonal change. Moreover, we are introducing a closed system for in-house wastewater treatment as a means of preventing pollution outside the premises. This is part of our ongoing effort to reduce environmental burden and employ water resources more effectively. (See page 19.)



Wastewater treatment facility/coagulative precipitation tank

Oily water separators are used to treat the compressor-generated emulsive wastewater (drainage), in which water and oil are intermixed. This equipment—a proprietary technology of Toppan—works by combining specific gravity and metal substitution without the use of chemical agents or energy. It is an effective and affordable means of separating and collecting oil.

Flow of oily-water separation



Patent pending as NT oil-separation method and metal-conversion method

Emergency Response and Preventive Action Measures

Preventing soil pollution

We have constructed concrete walls around tanks designed to store fuel oil, chemicals, and liquid waste in order to prevent them from leaking or flowing outside the premises in case of an emergency. Additionally, we check the tanks and pipes regularly in order to detect cracks and expedite the replacement of parts before soil pollution can occur.



Concrete walls surrounding liquid waste tanks

Emergency training

Chemical solvents are used in numerous plant operations. When these solvents are used, they are poured from tankers into tanks, a step that involves a certain risk, should an accident occur. At plants in which there is such a possibility of environmental impact, we regularly conduct anti-pollution training based on the *Manual on Emergency Response*, which describes leakage scenarios and the means to counter them.



Emergency training

Management of Chemical Substances

Measures to protect the ozone layer

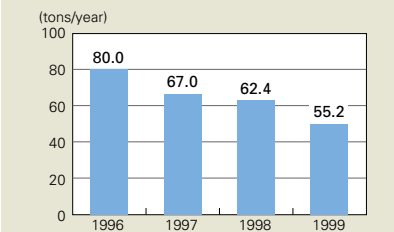
In March 1994, Toppan abolished the use of specific CFCs and 1,1,1-trichloroethane—both of which are associated with depletion of the ozone layer. These substances

were formerly used in cleaning processes. Currently, we still have 32 freezers using specific CFCs, and are working to replace them or install substitute systems.

Management of chemical substances

A key pillar of the Air Pollution Control Act is to take measures to prevent emissions of toxic and air-polluting substances by prompting the industry for the voluntary control. For example, we are working to reduce the use and emission of dichloromethane, conforming to the Guidelines Concerning the Promotion of Voluntary Control of Toxic and Air-Polluting Substances by Companies. Accordingly, in fiscal 1999, we achieved a 31% reduction in the volume of emissions to the air, compared to the figure for fiscal 1996.

Dichloromethane emission into the air



Corporations are strongly encouraged to make voluntary efforts regarding the management of chemical substances. The Japan Federation of Economic Organizations (*Keidanren*) has since 1998 conducted PRTR (Pollutant Release and Transfer Register) studies, prior to the Japanese government's enforcement of the PRTR Act, in order to clarify voluntary efforts from the industry's perspective. We conducted our own PRTR studies in fiscal 1997 and 1998 concerning the achievements by all our business sites, and subsequently reported the results to *Keidanren*. Currently, we are working to devise a system concerning the comprehension and management of emissions, as well as the transfer of designated chemical substances, as a means of preparing the company for enforcement of the PRTR Act in 2001. We will continue to employ the appropriate degree of risk evaluation and management, in the process substituting toxic chemicals, reducing their consumption and cutting emission to the atmosphere.

Waste Management

Focus and targets

Toppan is proceeding toward its ultimate target—to reduce the unit landfill disposal volume as proportioned to plant output by 50% in fiscal 2000, as compared to the fiscal 1990 figures. We have set the following five items as our main focus in reaching that target:

1. Reduction in waste generation
2. Reuse
3. Recycling
4. Heat recovery
5. Appropriate disposal

We are working to reduce the volume of landfill waste by approaching these items. Furthermore, we are promoting the use of recyclable resources corporate-wide, particularly in our model plants, in order to reach our zero-emissions target.

Achievements for fiscal 1999

In fiscal 1999, Toppan took another big step toward that target, thanks to a reduced unit landfill disposal volume of 61.4 (down 11.5 points from the previous fiscal year) and a recycling rate of 83.1% (an increase of 4.8 points over the previous fiscal year).

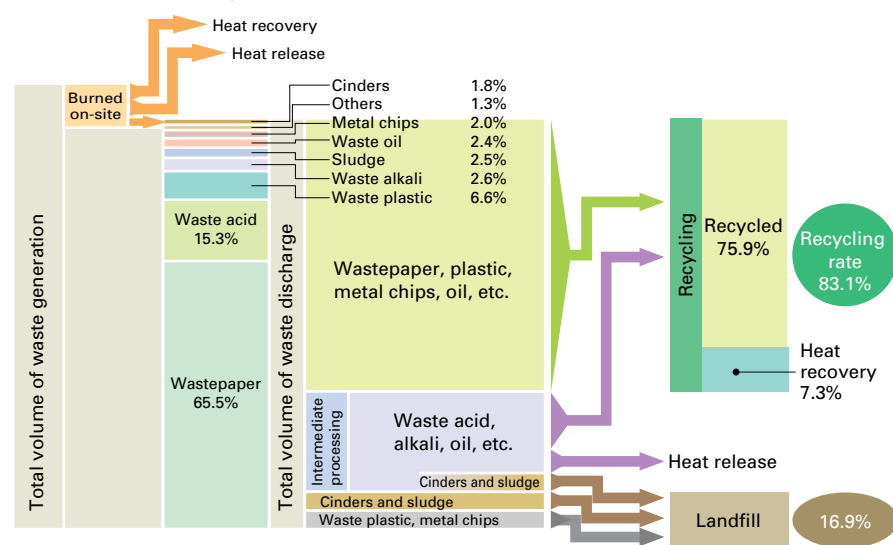
A key factor in the achievement is a 14.3% decrease in landfill waste as compared to the previous fiscal year. This is due to our effort to implement more thorough sorting and recycling, along with a 1.6% increase in plant output over the previous fiscal year.

Paper comprises approximately 66% of our plant waste, followed by waste etchant from electronics operations and waste plastic associated with flexible packaging materials.

While the total volume of waste discharge in fiscal 1999 was 342,000 tons—an increase of 9.8% over fiscal 1998—the volume of landfill waste was 58,000 tons, a drop of 14.3%.

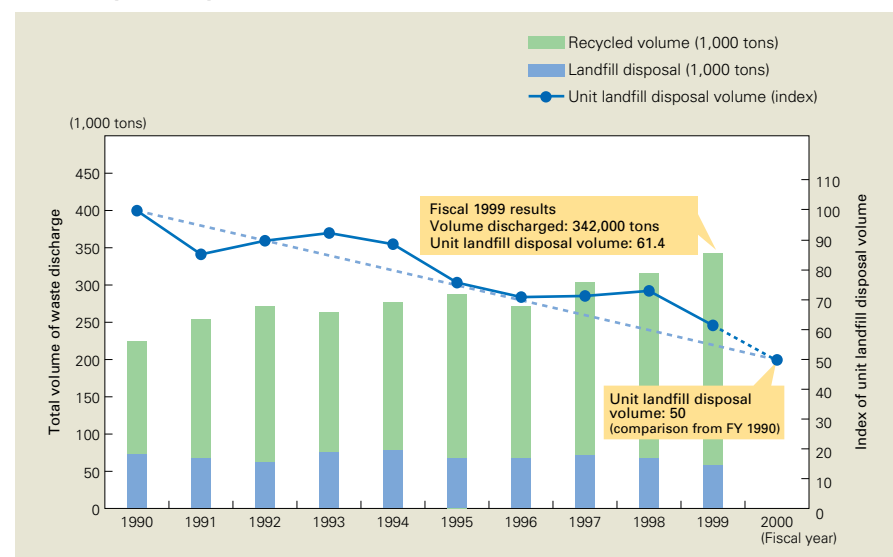
Looking closely at the breakdown by operation, it is clear that one of our remaining issues is to promote recycling and the

Breakdown of waste generation and the flow of waste treatment (FY1999)

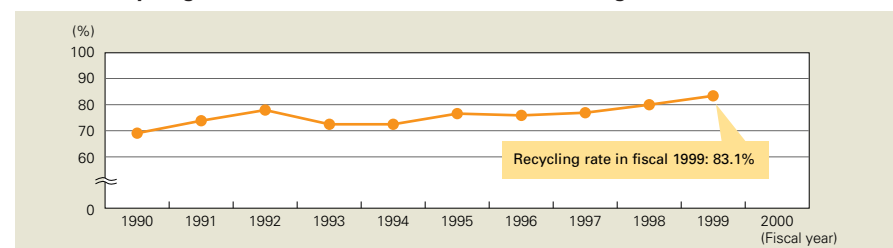


At Toppan, total volume of discharged waste is determined by subtracting the volume of waste processed in-house from the total waste generated. To avoid variation of how wastes are classified—valuable or non-valuable—year-by-year, they are included in the figure for total waste generated, as is wastepaper.

Trends in the volume of waste discharge and unit landfill disposal volume proportioned to plant output (FY1990 result = 100)



Trend in recycling rate in the total volume of waste discharge



effective utilization of sludge generated in electronics operations, along with the laminated materials of paper and plastic in pack-

aging operations. However, since fiscal 1998 there has been progress in our program of recycling.

Realizing the Zero-emissions Target

Promoting recycling

Toppan already recycles approximately 96% of its wastepaper, which comprises the largest share of its total waste volume. We are now working to use the remaining 4% in a more effective manner.

March 1999 saw the installation of a unique system known as RPF (Refuse Paper and Plastic Fuel) at Sagami-hara plant of our packaging operations. This system makes effective use of combined waste paper and plastic by converting it into solid fuel suitable for the generation of thermal energy. The combustion efficiency of our incinerators was thereby improved, fuel consumption volume for stabilizing burners was decreased to one-tenth and the weight of cinders was cut to one-third its previous figure.

We have also begun recycling a portion of the cinders and dehydrated sludge generated through our in-house, intermediate treatment, in order to convert them to cement and steel materials. This practice is being expanded through a process of study and experimentation.

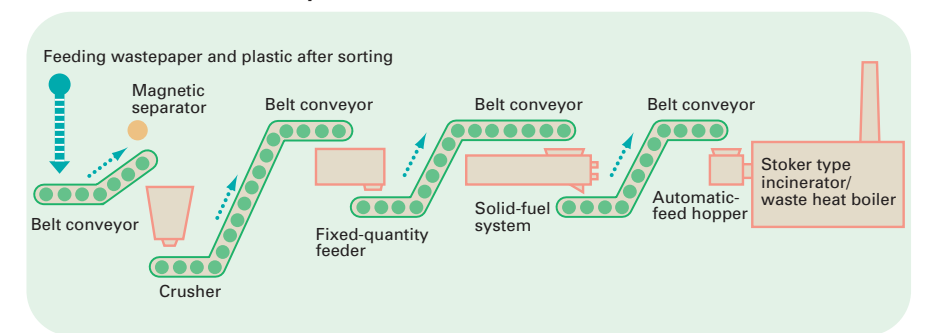
Establishment of model plants and targets

Regarding the formation of a recycling-oriented society, we have established “model plants for zero-emissions” as a means of examining the use of recycled resources and achieving zero-emissions in ten plants by March 2002.

Achieving zero-emissions

Our Sakado plant met the zero-emissions target in March 2000, the first such achievement for Toppan. Sakado has since November 1999 been working toward ISO 14001 certification, and has in the process succeeded in recycling all its industrial waste for use as resources. We will continue our efforts on behalf of similar achievements on the path toward zero-emissions. The efforts at Sakado plant and model plants for zero-emissions will expand horizontally to other plants.

Outline of the flow of RPF system



Plants introduced:	Sagami-hara plant (Packaging operations)
Basic equipment:	Crusher (up to 1 t/h) Fixed-quantity feeder Solid-fuel system (up to 1 t/h) Automatic-feed hopper (up to 1 t/h) Belt conveyors (installed between facilities)
Materials used:	Wastepaper (80–90%) Waste plastic (10–20%)
RPF heat generation:	18.8–20.9 kJ/kg (4,500–5,000 kcal/kg)

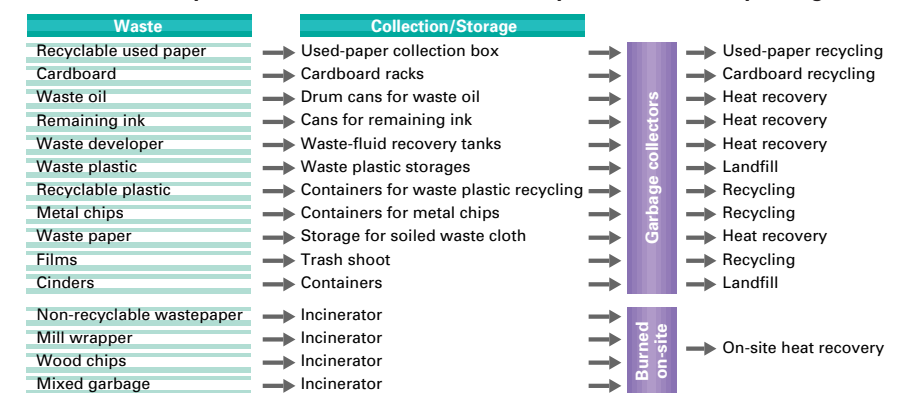


RPF system

Achievement status and specific issues at six model plants for zero-emissions

Plant	1997	1998	1999	Issues to be solved
Asaka plant (Commercial printing)	95.5	97.0	97.7	Cinders, waste plastic
Itami plant (Packaging)	93.7	94.8	92.5	Mixed wastepaper, waste oil
Toppan Seihon Co., Ltd. (Binding subsidiary)	98.9	99.2	98.9	Waste plastic, mixed wastepaper
Sano plant Toppan Containers Co., Ltd.	88.9	99.3	99.2	Mixed wastepaper
Mikkabi Toppan Printing Co., Ltd.	94.9	95.7	95.4	Waste plastic, waste oil
Toppan Johhoku Printing Co., Ltd.	90.7	91.7	92.3	Waste plastic, waste oil

Flow of waste separation and collection at the Asaka plant (Commercial printing)



Waste storage



Signboard for waste storage

Energy and Resource Savings

Focus and target

To do our part in the prevention of global warming and excessive resource consumption, we are working to reduce the emission of CO₂—noted as a greenhouse gas—and achieve more efficient energy use. We have established a target reduction in unit energy consumption, proportioned to plant output, of 20% by fiscal 2005, as compared with the fiscal 1990 figures, and are fully engaged in that effort. In our stride toward that target, we are promoting the following items as the three pillars of our energy-rationalization measures:

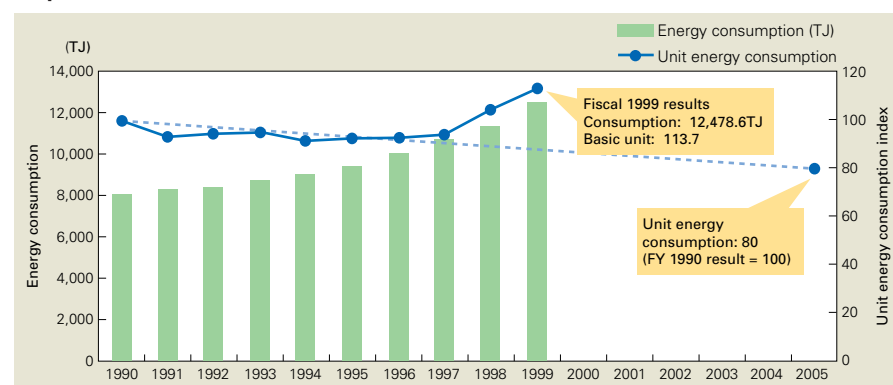
1. Introduction of high-efficiency systems and facilities
2. Improved efficiency in production
3. Thorough daily management

Each February and August our plants conduct special Energy-Saving Month activities and submit reports to the head office describing their daily management of energy-saving activities, including maintenance and

Measures toward energy rationalization

1. Introduction of high-efficiency systems and facilities
 - Introduction of high-efficiency production facilities
 - Introduction of a high-efficiency energy-supply system (introduction of cogeneration system, absorption refrigerating machines, etc.)
 - Systematic configuration of boilers, compressors, etc.
 - Use of waste heat for air-conditioning and drying processes by waste-heat boilers adjacent to the incinerator
2. Improved efficiency in production
 - Yield increase by TPM (Total Productive Maintenance) activities
 - Production process development by introducing in-line machinery
 - Improvement of drying methods in the printing process
 - Conversion to machinery with high energy-efficiency
3. Thorough daily management
 - Promotion of energy savings in existing equipment
 - Maintenance and inspection of energy-related equipment and facilities
 - Reduced operations and awareness-raising activities for conservation of resources

Trends in energy consumption and unit energy consumption proportioned to plant output (FY1990 result = 100)



We used joule (J) for the thermal unit, based on the conversion value set forth in the 1999 Survey on Economic Statistics Concerning Energy.

inspection operations for production facilities and awareness raising activities with regard to energy conservation.

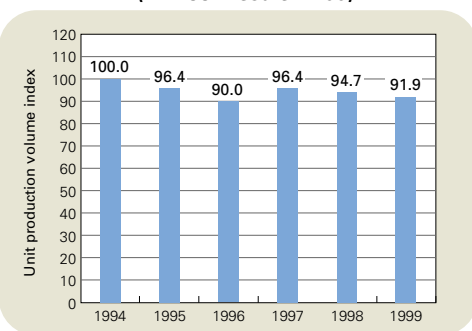
Achievements for fiscal 1999

Last year's unit energy consumption was 113.7, an increase of 9.0 points from the preceding fiscal year. This was quite a serious blow to the achievement of our target. Contributing to this were the fact that energy consumption increased by 10.5% over the previous fiscal year due mainly to facility upgrades at our plants for electronics operations, the introduction of automated labor-saving systems, and improved work place environments. Amid this was an increase

of only 1.6% in plant output due to unit price depreciation caused by the stagnant economy.

External agencies conducted energy analysis in designated plants, including Asaka (electronics operations). The result suggested that energy-related measures have already been applied to the facilities in operation, while the cost-related aspect of our major plan—which concerns the introduction of large facilities—still remains an issue. We will also have the analysis conducted at other plants and take new measures while considering the balance between costs and energy reduction.

Example Unit production volume trends at a commercial printing plant (FY 1994 result = 100)



Since last fiscal year, we have been examining and implementing the use of unit production indexes that reflects the actual status of plant output and energy efficiency without being influenced by price fluctuation. Specifically, each plant sets targets for volume of workable production, then calculates unit production indexes for production volume, by combining the targets with traditional unit plant output. Although we are yet unable to accurately assess the trend in unit production indexes, given that we have only been applying them since last year, we expect to be able to more thoroughly grasp the actual state of energy consumption at our plants.



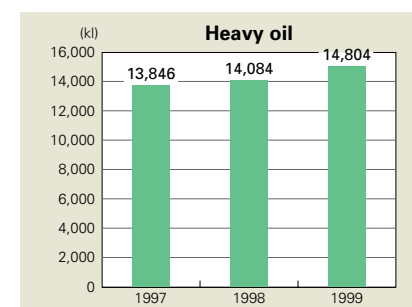
Absorption refrigerating machine



Cogeneration system

Consumption volume by energy type

The consumption of electricity, city gas, heavy oil, and kerosene is on the increase. Approximately 90% of that increase is accounted for by additional consumption at new plants, facility enhancements in the Electronics Division Headquarters, and the introduction of automated labor-saving systems. City gas consumption scored the highest increase of 15.6% from the previous fiscal year, as a result of fuel conversion for the purpose of reducing SO_x and CO₂ emissions.

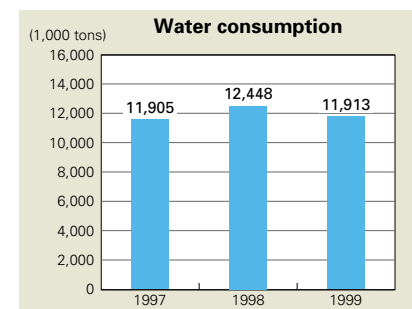


CO₂ emission

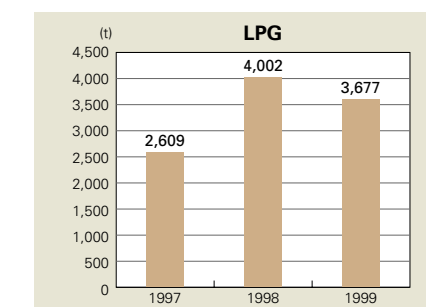
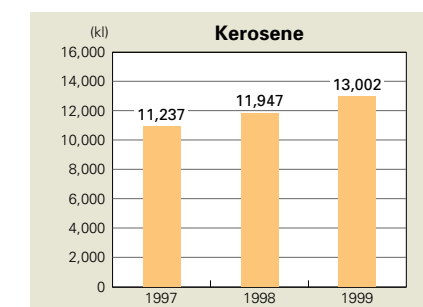
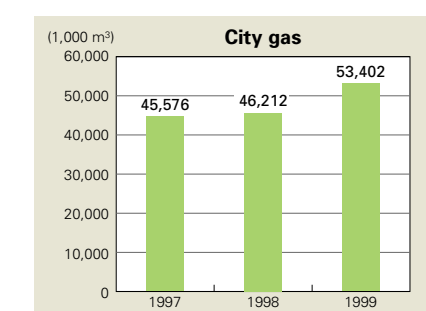
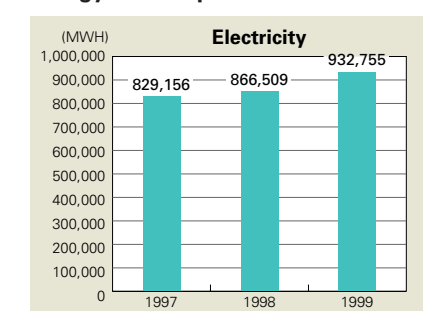
In conjunction with increased energy consumption, the emission of CO₂ rose to 586,600 tons last fiscal year, marking a 7.8% increase from the preceding year. We will continue our efforts to reduce CO₂ emissions through a decrease in energy consumption, along with further conversion to city gas, which emits less CO₂ than other types of fuel.

Water-resource protection and recycling

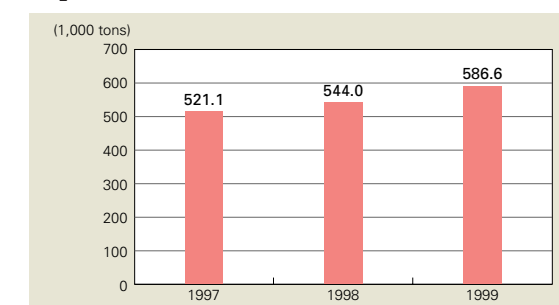
In our electronics operations, which uses large amounts of water, we are actively promoting reductions in water usage and wastewater volume, along with more effective resource management by recovering and recycling wastewater using a proven system.



Energy consumption trend

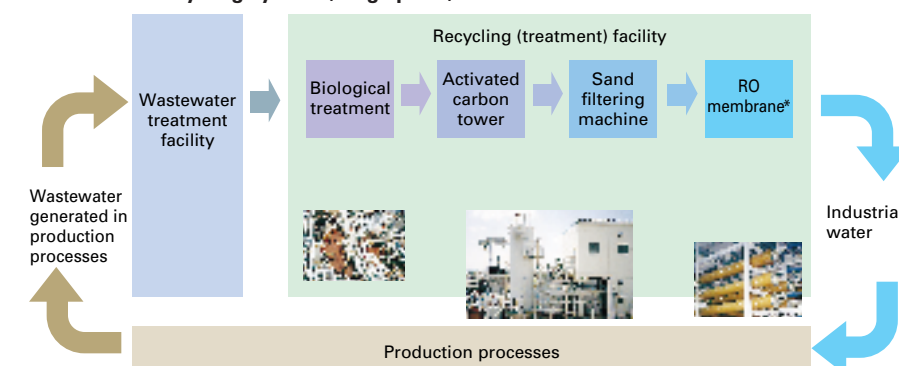


CO₂ emission trends



Calculations for the volumes of CO₂ reduction and emission are based on the CO₂ emissions coefficient cited in the Environment Agency's Manual for Establishing Action Plan pertaining to the Law Concerning the Promotion of the Measures to Cope with Global Warming (See Article 8, Section 1.)

Wastewater recycling system (Shiga plant)



*RO membrane: Refers to "reverse-osmosis" membrane, which is water-permeable but filters almost all solutes. This makes it possible to remove solutes from the water by applying pressure to solutions.

Office Eco-protection

Efforts in the Office

To enlist participation of every employee in recycling and resource conservation, Toppan promotes environmental conservation activities in its offices (indirect departments) as "office eco-protection." Our head office and buildings in Akihabara, Koishikawa, Honjo, and Shibaura, and offices in each of our plants collectively participate in this endeavor.

Recycling of used office paper

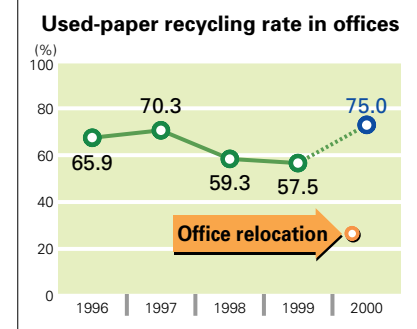
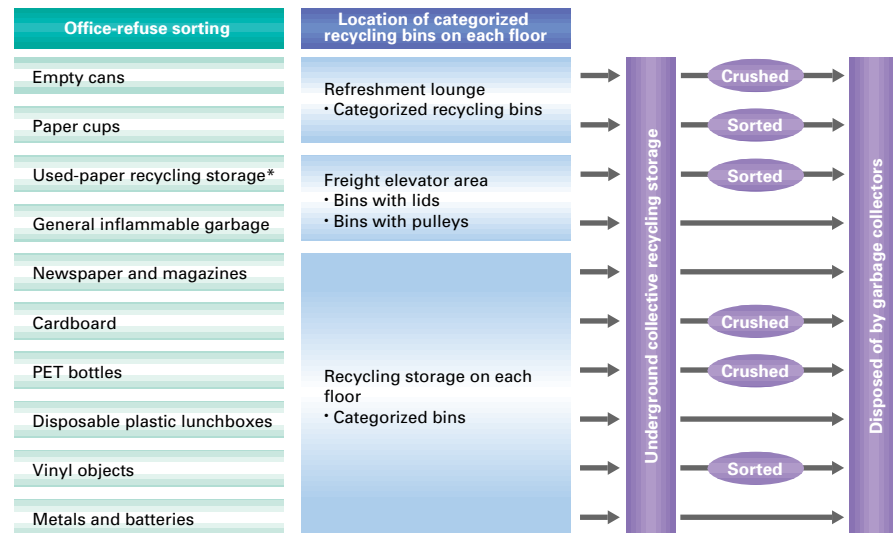
Our head office and surrounding buildings in Akihabara had been working toward a target of 75% used-paper recycling by fiscal 2000, but the rate remained at 57.5% due to departmental relocation to the new Toppan Koishikawa Building last year. We will therefore review our system for used-paper sorting, and will act upon the results of that review beginning in fiscal 2001. Such action will be based upon the system of operation in place at the Akihabara head-office building complex, which was revised in May 2000.

Employees at the new Toppan Koishikawa Building are encouraged to separate and dispose of waste in the nine categorized recycling bins situated on each floor. The sorted waste is then brought to an underground collective recycling storage, where it is stored after compaction and finally disposed of by garbage collectors. Beginning from the next fiscal year, we will set clear target and promote activities to ensure we achieve it.

Energy saving

We are now working on the integration of energy-saving fluorescent lamps and motion sensors in lighting apparatus as part of our energy-saving endeavors in the offices. Moreover, we have introduced an ice thermal-storage air-conditioning system in our Akihabara sales department building and the Shibaura building in order to rationalize the consumption of electricity. Our employees have even adopted various daily energy-saving activities in their offices, beginning with the application of Energy-Saving Month, which includes temperature man-

Standards for office refuse sorting at Toppan Koishikawa Building



(Akihabara head-office complex)



Categorized recycling bins in refreshment lounge



Recycling storage on each floor (Koishikawa building)



Recycling bin for paper only (Koishikawa building)



Heat pumps operated by ice thermal-storage systems (Shibaura building)

Slogan for the Energy-Saving Month, FY1999

Summer (August)	Turn off the power, and turn on your energy-saving awareness!
Winter (February)	Everyone's in charge of energy saving. Small steps take us a long way!

agement via air-conditioning adjustment, alternating "lights out" periods—including office equipment such as PCs during lunch breaks and reduced usage of lighting in hallways—and encouraging employees to use the stairways instead of elevators.

Water conservation

Our Honjo GC Building introduced a system for the use of rainwater in April 1994 as a means of saving water. Accordingly, the consumption of service water was cut by 3,175 tons last fiscal year. The Toppan Koishikawa Building has installed a similar system, using water-recycling equipment that collects used water from washbasins and cafeterias, and then BOD treatment to reuse it as flushing water for toilets. This system, which went to work in May 2000, is estimated to produce water savings of 100 to 130 tons monthly.

"Green Purchasing"

Basic policy and in-house standards

The realization of a recycling-oriented society means we must give priority to the purchasing of environmentally preferable products. We instituted "green purchasing" corporate-wide in January 1999, based on our Basic Policy on "Green Purchasing." In accordance with this policy, we purchase products that meet our in-house standards, especially for designated product categories: office paper, copiers, printers, PCs, and toilet paper. In fiscal 1999, we revised our standards and expanded "green purchasing" corporate-wide to cover stationery and office supplies.

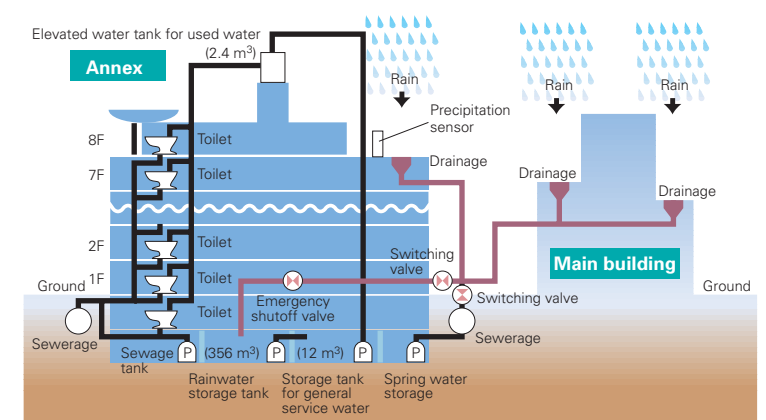
Achievements for fiscal 1999

Toppan achieved 100% "green purchasing" for designated products other than office paper and toilet paper in fiscal 1999. (Beginning in fiscal 2000, results for stationery and office supplies will be gathered in the same manner as other products.) Furthermore, we will be promoting and expanding "green purchasing" based on the current system so that ultimately we can construct a "green procurement" system that maximizes the purchasing and use of environmentally preferable production materials.

In-house "green-purchasing" standards

Designated products	Standards for purchase	Rate achieved in FY1999
Office paper	Must be made of 70–100% recycled paper, with brightness of 80% or less.	97.7%
Copiers and printers	Must have an automatic sleep or shutdown function after remaining idle for a specified period.	100.0%
Personal computers	Must have an automatic sleep or shutdown function after remaining idle for a specified period, with limited electricity consumption in sleep mode.	100.0%
Toilet paper	Must be made of 100% recycled paper, with brightness of 80% or less.	98.7%
Stationery and office supplies	Must have an appropriate certification (Eco-Mark, Green Mark, etc.) or be classified by the manufacturer as an environmentally preferable product.	62.2%

Figures used for stationery and office supplies are from the six-month period from October 1999 to March 2000.



Rainwater utilization system (Honjo GC Building)

Rainwater usage

	Volume (tons/year)
Honjo GC Building	3,175 (result from FY1999)
Koishikawa building	1,200 (volume expected for FY2000)



Recycling facility for general service water (Koishikawa building)

Basic Policy on "Green Purchasing"

It is important that today's corporations become actively engaged in global environmental conservation; yet it is equally important to understand that the range of engagement is expanding. That is why we promote global environmental conservation, adopting Toppan's Declaration on the Global Environment as its basic philosophy. Moreover, we will be putting forth a corporate-wide effort regarding "green purchasing" (preferred purchases of products posing a reduced environmental burden) in order to help achieving a recycling-oriented society.

Each purchase is made in consideration of the environment, in addition to cost and quality, from the viewpoint of the lifecycle of the product. Moreover, we promote "green purchasing" based on the guidelines established by the Green Purchasing Network, in order to phase in a consistent and thorough program.

Basic Principles on "Green Purchasing"

- 1. Consideration of product lifecycle**
Make a purchase in consideration of various environmental burdens in the product's entire lifecycle, from resource collection through disposal.
- 2. Consideration of business efforts**
Purchase products that are produced and sold by businesses dedicated to environmental conservation.
- 3. Acquisition and utilization of environment-related information**
Prior to purchase, obtain and make use of environment-related information concerning the products and/or their manufacturers and retailers.

January 4, 1999
Toppan Printing Co., Ltd.



"Green purchasing" for in-house publications

- Internal publications, corporate brochures, business reports, environmental reports, annual reports, and company tools, including calendars
→ Produced from 100% recycled paper
- Company envelopes
→ Produced from 100% recycled paper
- Employee pocketbooks
→ Main body: Produced from 100% recycled paper
→ Covers: Made of olefin plastic
- Business cards
→ Produced from 70% recycled paper

Efforts in Product Distribution

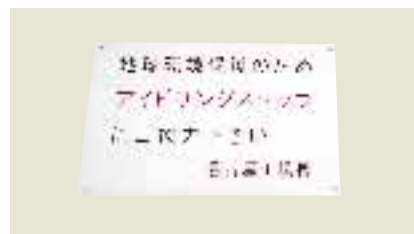
Efforts in Transportation

“Stop Idling” campaign

Toppan Logistics Co., Ltd., our product-distribution subsidiary, instructs its truck drivers to observe legal speed limits, drive at a constant speed on highways, and refrain from idling their engines while transporting goods. Beginning in May 1995, the company has also been promoting its “Stop Idling” campaign as a means of preventing air pollution and further warming of the Earth’s atmosphere. Specific items of instruction include, 1) engine-warming should be kept to within three minutes regardless of the season; and 2) engines should be stopped during waiting periods as such notices are printed on posters to enhance driver awareness. We have also opened a lounge where the drivers can spend time during their waiting periods, to further promote the campaign. Consequently, 46 trucks owned by Toppan Logistics have lowered their monthly fuel consumption by an average of 274 liters.



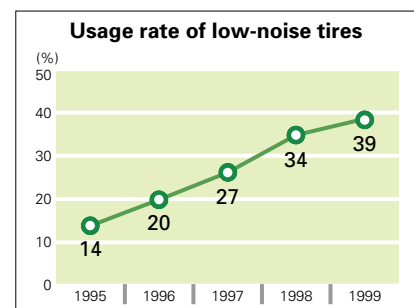
Drivers' lounge



A “Stop Idling” campaign poster which reads “Please cooperate in our ‘Stop Idling’ campaign for global environmental protection—Manager, Nagoya plant”

Introduction of low-noise tires

In conjunction with the “Stop Idling” campaign, we began introducing vertical-tread, low-noise tires, which not only make less noise on the roads but also generate less frictional heat and therefore help prevent global warming. In fact, Toppan Logistics achieved a 39% usage rate of low-noise tires in fiscal 1999, and is working to reduce waste and promote the effective recycling of tires.



Introduction of battery-powered forklifts

Toppan is actively promoting the conversion from fuel-powered forklifts to battery-powered units. While the former type will consume approximately 400 liters of gasoline per month, a battery-driven forklift can eliminate not only gasoline and oil consumption but also exhaust emissions as well. Furthermore, it can reduce mechanical waste, including various tools and parts used for inspections. In fiscal 1999, Toppan Logistics achieved a 73% usage rate for battery-powered forklifts.

Introduction of environmentally preferable company cars

The use of environmentally preferable company vehicles is a concept we are increasingly promoting. Consequently, by March 1999, there were ten such vehicles in our fleet.



Environmentally preferable company car

Efforts in Packaging

Reduction of packing materials

Toppan is endeavoring to use recycled materials and reduce the amounts of packing materials used to prepare products for distribution. For example, in the past, we have used cardboard delivery boxes for the distribution of electronic components, and these boxes were dumped and recycled after each use. However, we have now switched to plastic boxes in order to reduce waste volume, thereby eliminating the wasteful practice of dumping cardboard boxes after delivery. Additionally, we developed a new packing method for life-size sales promotional tools. One example is the packing-integrated life-size POP (point of purchase), which is designed so that upon opening up the package and assembling the parts, the packing materials become part of the finished product (see page 27). We have another type of product for which packing materials are transformed into a sales counter at the store.

Toppan will continue to use and propose such packing materials as a means of demonstrating our commitment to environmental conservation.



Plastic delivery box



Packing-integrated life-size POP

Fields of Business and Environmentally Preferable Products

Living Environment

Packaging
Proposal for development and services concerning environmentally preferable containers and packaging materials, including resource conservation and easy recycling. Compliance with the Containers and Packaging Recycling Law.

Industrial Materials
Response to demand for lower environmental impact when disposed, in the housing and interior products fields, including wallpaper and decorative sheet materials.

Electronics
Compliance with the Home Appliance Recycling Act and “green purchasing” in the areas of home appliances and electronics products.

Toppan takes a key role in the development of environmentally preferable products as part of our contribution to sustainable growth and the realization of a recycling-oriented society. The chart below shows the business fields in which we have been promoting the development of environmentally preferable products while taking advantage of characteristics of each sector in

which we are involved.

In fiscal 2000, we set principles and standards regarding environmentally preferable products. In the process, we defined a system for detailed product descriptions on labels, thus further conveying the environmental claims of our environmentally preferable products.

Information & Networks

Securities and Cards
Enhanced recyclability of various cards produced for financial institutions, municipalities, amusement parks, and other concerns. Reduction of environmental burden when disposal of cards.

Commercial Printing
Environmental measures in the production of posters, catalogues, pamphlets, sales promotion tools, etc., including the use of recycled and tree-free paper, as well as soy ink or recycled vegetable-oil ink.

Publications Printing
Planning and proposals for bookbinding and processing methods for easier recycling, including the use of recycled paper, tree-free paper, as well as soy or recycled vegetable-oil inks.

Reduced resources consumption

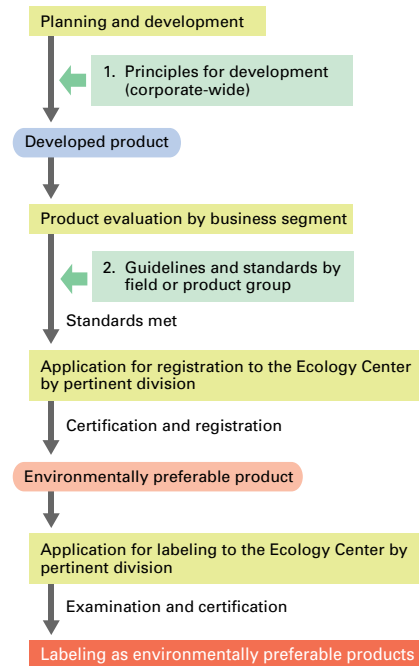


Designation of Environmentally Preferable Products

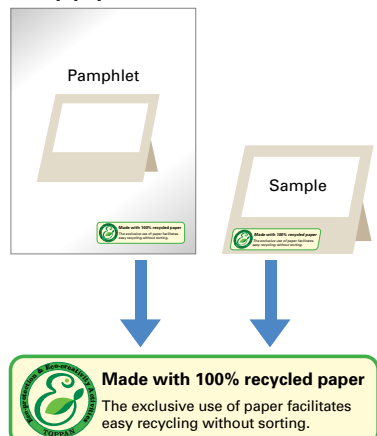
Establishment of Principles and Standards for Environmentally Preferable Products

Toppan established corporate-wide principles for the development of environmentally preferable products, consisting of the

Flow of environmentally preferable product designation and labeling



Example of Toppan's labels for environmentally preferable products: Desktop paper calendars



three items described below.

Under these principles, we required each of our business operations to set guidelines and standards for environmentally preferable products to rebuild our development system for environmentally preferable products.

With a given product in planning and development, we conduct an evaluation based on these guidelines and standards and designate the product as environmentally preferable if it meets these standards.

Toppan's Labels for Environmentally Preferable Products

Toppan promotes labeling for environmentally preferable products on such products' pamphlets and samples, in order to appeal their respective environmental claims in a comprehensive way.

Labeling begins with twelve environmental claims exemplified in type II environmental labeling of ISO 14021. Upon receipt of an application from the division in charge of such product, the Ecology Center conducts an evaluation and proceeds to certify and manage the labeling practice.

1. Principles for the development of environmentally preferable products

- 1) By evaluating the lifecycle of the candidate product, we clarify its specific effects in reducing environmental burden.
- 2) The candidate product should be evaluated based on the guidelines and standards for environmentally preferable products set for each business field or product group.
- 3) Evaluation grounds should be provable (available for disclosure).

Items considered in the preparation of guidelines and standards for environmentally preferable products

- 1) Resource consumption
 - Use of recycled materials
 - Resource-conservation ability
 - Energy-conservation feature
 - Use of common parts
 - Use of recyclable materials
 - Reusability
 - Easy reparability
 - Minimization of material types
 - Durability
 - Easy separation and sorting
 - Information disclosure concerning contained materials, recycling methods, etc.
- 2) Substances with greenhouse effects
 - Environmental conservation in production
- 3) Pollutant emissions
 - Environmental conservation in production
- 4) Waste generation
 - Reduction of solid waste
 - Low environmental impact when disposed
 - Use of safe materials
- 5) Disposal of toxic substances
 - Suitability for disposal
 - Use of safe materials

2. Guidelines and standards for environmentally preferable products set for each business field or product group

Item	Definition	Detailed standards
Safe materials (low environmental impact when disposed)	Must not contain substances with acute toxicity or toxic substances with long-term effects such as mutagenicity, carcinogenicity, and endocrine-disrupting effects.	1. Plastic: Materials that use no polycarbonate, polyvinylchloride, or epoxy resins. 2. Flameproof agent must not contain PBB (polybrominated biphenyls), PBDE (polybrominated diphenyl ethers), or short-chain chlorinated paraffins. - Evaluation will not be conducted for products that do not meet the above standards. 3. No aromatic hydrocarbon content.
Recyclable materials	Materials that have established recycling routes in society.	Paper and cardboard
Minimization of material types	Main body of the product must be made of a single material. Supporting parts do not impair its recyclability.	
Recycled materials	Must contain recycled or reused materials (excluding materials recycled during production processes).	Recycled paper → 50% or more used-paper content Biogasite paper → 10% or more biogasite pulp content Plastic → 70% or more recycled plastic content Cloth made from recycled plastic → 50% or more recycled PET content
Information disclosure	Must have indications such as an "environmental label" and a "list of materials contained." Must indicate information on recycling and disposal.	
Resource-saving	Reduced use of exhaustible resources. The usage volume must be less than that for traditional products.	* Only when it is possible to compare with conventional products. * Exhaustible resources Petroleum: Petroleum solvent usage in ink for offset printing must be reduced by 10% or more on sheet-feed presses and 5% or more on web-offset presses. Metals: No use of rare metals (according to the 2000 version of the Manual for the Mining Industry). * Utilization of unused resources: lumber (brushwood in forestland, small-diameter wood, thinned wood, etc.)
Reduction of solid waste	Reduction of solid waste in the production process, products and packaging.	* Only when it is possible to compare with the previous year. * Includes the use of packing materials.
Use of common parts	Standardization and common use of parts and molds.	Molds: Tools for shaping goods, such as trimming and forming dies.
Environmental conservation in production	Appropriate treatment of pollutants to the air, water, and soil.	Must pass an examination conducted by Toppan.
Energy saving during transportation and use	Reduction of weight and volume.	* Only when it is possible to compare with conventional products.
Reuse	Reusable without changing the product's original shape.	
Easy reparability	Reparable without the use of special tools.	* Special tools: Tools other than cutters and screwdrivers.
Easy separation and sorting (low environmental impact when disposed)	Easily separated or sorted by hand without the use of special tools.	* Special tools: Tools other than cutters and screwdrivers.

Example of guidelines for environmentally preferable POP tools (Commercial Printing, July 2000)

Examples of descriptions on Toppan's labels for environmentally preferable products

Product name	Environment claims	Additional explanation
Bulky waste tickets (stickers)	Reduction of waste	Mountings for stickers can be used as receipts, instead of ending up as waste.
Paper IC cards	30% used-paper content	Cards made of paper with 30% recycled pulp content, ensuring ease of processing.
Desktop paper calendars	Made with 100% recycled paper	The exclusive use of paper facilitates easy recycling without sorting.
Environmentally preferable exhibition system	Reusable	Parts can be disassembled and reused.
Toppan Green Paper 100	100% used-paper content	Recycled printing paper with high printability and strength.
Light Paper	100% used-paper content Recyclable	Recycled paper with high printability. Recyclable.
Ecogloss	90% used-paper content	Water-based varnish and soy ink are used. Recyclable.
Neovert	100% used-paper content	Recycled products using paper waste from cartons for beverages.
Ecotainer	Designed for easy detachment	The external paper box and internal resin bag can be easily separated and recycled.
TP Trays	Made with 100% recycled paper	Paper cushioning materials using cardboard paper.
TL-PAK	Designed for easy detachment	The external paper box and internal resin bag can be easily separated and recycled.
Standing refill pouches	70% reduction of resin (by weight)	Resin volume is reduced 70% by comparison with our conventional resin bottles of the same capacity.
Ecoslim	25% reduction of resin (by weight)	Resin volume is reduced 25% by comparison with our prototype resin bottles.
Bottles made of recycled materials	50% recycled-plastic content	50% content of recycled plastic.
AP Cartons	Made with 80% recycled paper	Paper-based containers made of used-paper with water-resistance added.

Evaluating Environmental Impact

There are several ways of evaluating the environmental impact of a product. The following describes various cases we are currently researching.

Collection of lifecycle inventory data

Toppan's Life Cycle Assessment (LCA) system was originally created for use in packaging operations as a means of collecting and evaluating data. In consideration of the trends in ISO standards regarding LCA, however, we renewed the system to meet the need for environmental-impact evaluations in our packaging business. We reviewed our system of quantitative data collection in production processes, with emphasis on the collection of more accurate data concerning raw materials, energy, waste, and CO₂ emission.

We receive feedback on the collected data and use it in the design of products, resulting in reduced environmental impact and the enhancement of our overall production process. This data is also made available to our customers upon request, for use in their own environmental initiatives.

Toppan is now working to enhance the

collection of data regarding the "upstream" areas of product manufacturing. As such, we are calling for cooperation from materials manufacturers and industry, and will evaluate products' entire lifecycle with thorough assessment of the data collected in each field.

Product assessment method

The Commercial Printing Division Headquarters developed a system of qualitative environmental impact evaluation via a method of product assessment used to evaluate the impact of our POP tool products. The product assessment for POP tools is therefore conducted during the planning-and-development stage in order to improve the product. Such a method is used when we make product proposals to customers to clarify environmental concerns regarding these products.

Product assessment sheet for POP tools (Commercial Printing)

A primary summary screening assessment is conducted so that only those that pass the screening can proceed to the assessment of a given product for its entire life cycle.

This year, we will accumulate assessment data and examine the possibility of extending our method into development management for the commercialization of environmentally preferable POP tools.

Checklist of primary screening for POP tools (Commercial Printing)

- Use of safe materials
- Use of recycled materials
- Minimization of material types
- Enhanced loading efficiency
- Easy separation and sorting
- Use of recyclable materials

Efforts in Toppan's Business Fields

Packaging

The Containers and Packaging Recycling Law went into effect in April 2000. Subsequently, efforts on behalf of a recycling-oriented society have advanced considerably, not only in the industries concerned, but also in the large-scale participation of municipalities and the public.

Our Packaging Division Headquarters began taking steps toward the realization of an "environmentally-advanced company," thereby setting up a program known as Package Environment 2000. This program consists of four projects.

Among them, the ISO 14001 Certification Acquisition Project took off in August 2000, and currently, we are working on the construction of an environmental management system (EMS) that conforms to ISO standards (requirements). We established an approach toward the realization of an eco-office and the reduction of environmental burden caused by products and services in the operations of our development and planning departments.

In the DfE (Design for Environment) Promotion Project, we are establishing guidelines for environmentally preferable product development and design.

We are also working on the EPE (Environmental Performance Evaluation) Promotion Project to construct a database for quantitative evaluation of environmental burden by examining and collecting data on

product manufacturing.

The sales departments, which spearheads our operations in eco-business, has established the Environmentally Preferable Product Development Project and is preparing a business plan intended for the development of such products from the customer/consumer perspective.

Industrial Materials

The Industrial Materials Division has positioned the cause of environmental contribution as a main policy for the 21st century, and is putting forth a considerable effort in that regard.

The Division's two domestic production bases—the Kashiwa and Satte plants—have already obtained ISO 14001 certification. Inspired by this, we have pledged to make a constant effort in environmental conservation. In fact, we have already developed and marketed several environmentally preferable products, including Toppan Ecosheet and Toppan Ecowall products. We are now developing industrial materials that are made of recyclable materials or which can be easily separated and detached. We are also engaged in the development of interior decor parts made from recycled materials.

The Division has published a brochure entitled *Toppan Eco Movement* as a divisional summary of concepts for the development of environmentally preferable products. This brochure describes the attempts to evaluate the degree of environmental contribution regarding certain products, the future prospects for product development, and so forth. We are planning to share the brochure with our customers as a communication tool, and to reflect their comments in future products.

Additionally, we have begun analyzing our products using the LCA method and are currently collecting and analyzing data on the input and output of materials and resources at each plant. This is being done in order to evaluate our environmentally preferable products more objectively.



Brochure: *Toppan Eco Movement*

Commercial Printing

The Commercial Printing Division Headquarters is moving forward with its Commercial Printing Eco-Project, for which seven work-groups have been established. The project was initiated to devise a general approach regarding the "environment" in places where we conduct business with our customers. This is because we believe that care for the environment should be considered an important part of a product's added value, and that it should be refined as such. Therefore, our ongoing activities are based on proposals for and the supply of products and services that contain not only the traditional focus of Q (Quality, encompassing functions), C (Cost), and D (stable Delivery) but also E (the Environment).

Products created through these activities include the Toppan Green Paper 100 Series—our proprietary printing paper with 100% used-paper content—and the Ecology Easy Order POP Series, which uses recycled materials.

Apart from product development, we are also active in supporting the preparation of environmental reports, as a means of assisting our customers in their disclosure of environmental activities.

Development of Environmentally Preferable Products

Efforts to reduce resource consumption

Packing-integrated life-size POP

Toppan is now developing POP (point of purchase) displays that integrate with their packing materials as part of an effort to reduce resource usage yet enhance product performance. Furthermore, we are also considering post-use sorting and working on the disassembly of different materials, as well as reducing packing materials and enhancing loading efficiency during transportation.



Eco-PAK packing-integrated life-size POP

Efforts in reusable products

Reusable exhibition systems

Product reuse is an issue of considerable importance, next to the reduction of resource usage. We introduced and are now promoting a Reusable Exhibition System as part of our efforts in that regard.

Conventionally, exhibition booths were made for specific exhibitions or events, and as such were discarded after use. Thanks to sectional panels and frames, though, our system can be dismantled and stored following the close of an event. The convenience of this feature has become a key point in the sales of Toppan's Reusable Exhibition System.



Reusable Exhibition System

Recycling efforts

(1) Glossy paper-based containers for more efficient recycling

Responding to the full enforcement of the Containers and Packaging Recycling Law, the packaging industry is heeding the need to take care of the environment. Concurrently, the use of soy ink has been spreading, particularly in the area of publications printing. This is due to its compatibility with recycling, as well as its potential as a substitute for petroleum solvents and ease of de-inking. Soy ink has been in demand for paper containers, as it has heretofore been difficult to combine with UV coating, a varnish that adds the important feature of surface gloss.

We therefore developed a water-based, high-gloss varnish having high de-inking ability—a product that can also be used together with soy ink. With that, we succeeded in the commercialization of our Ecogloss paper-based container. This product features a special coated cardboard with recycled paper content exceeding 90%, yet which readily accepts soy ink and high-gloss varnish. We developed and commercialized this product with full consideration for the glossing feature, along with production costs, and the need to protect the environment.



Ecogloss environmentally preferable paper container

(2) Development of Ecology Calendar

To enable a more recycling-oriented society, it has become more important than ever to design products that are easy to recycle after use. Accordingly, we are developing technologies to produce calendars that use neither plastic nor metal hooks, and that offer greater recyclability through the use of a single material for the entire product. For example, we developed the "self-binding eco-method," featuring a cutout on the upper edge of the calendar's main body so that it can be hung up simply by folding the

cutout part. With this, we achieved the reduction of material types by using only paper for the entire product. We are using Toppan Green Paper 100—a product featuring 100% used-paper content—and aroma-free soy ink for this product, and are promoting it as an environmentally preferable calendar.



Self-binding Ecology Calendar

Reduced environmental burden in post-consumer processing

Card developments using PET-G materials

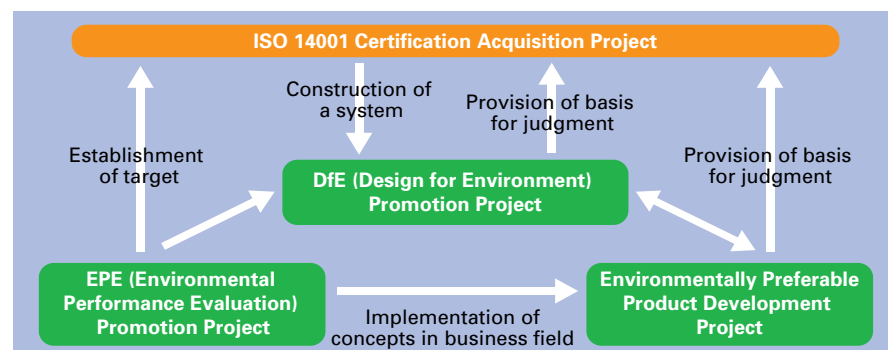
The reduction of environmental burden in post-consumer processing is indeed an issue of importance. Although the card industry currently gives priority to thermal recycling or incineration for purposes of security, there is increasing demand for reduced environmental burden, especially regarding the generation of toxic gases when incinerated.

Toppan has promoted cards made of PET-G materials. This year, we are proposing the "Ecotrough" card, which offers a combination of better processability and heat resistance.



Ecotrough card made from PET-G materials

Overview of Package Environment 2000



Partnerships in Creating a Recycling-oriented Society

Creating a System for Recycling

We believe the creation of a recycling-oriented society requires that environmental conservation activities be promoted in product development and manufacturing, and that partnerships be established with consumers, public administrations, municipalities, and NGOs.

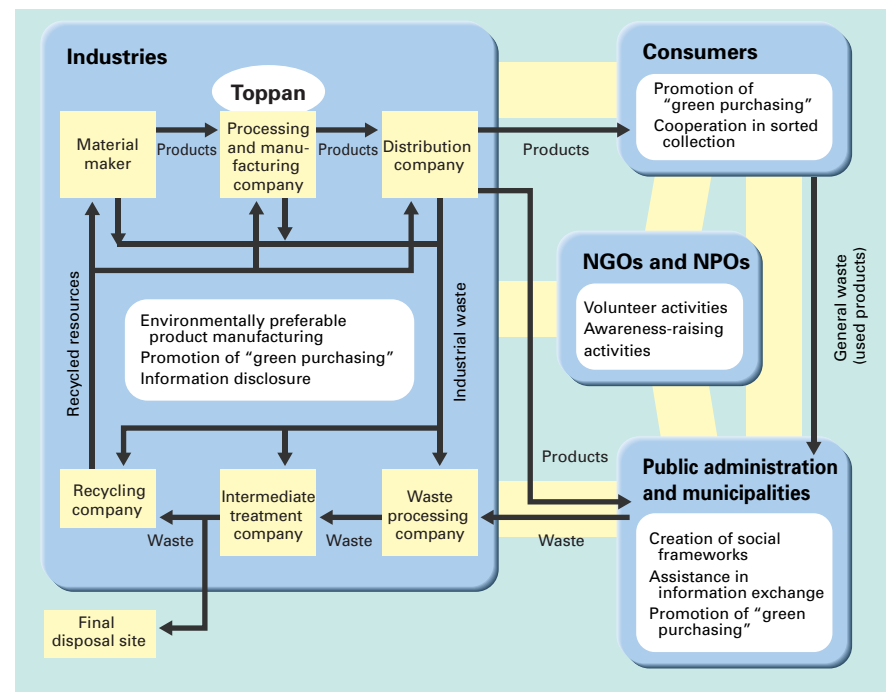
Recycling system for printed materials

Toppan established a recycling system for printed materials in cooperation with customers and paper manufacturers, in order to establish a complete recycling system that can ensure the preservation of resources. We established this system through the efforts of our Chubu Division, in cooperation with the Tokai Co-op Consumers' Co-operative Federation and its member groups: the Meikin Co-op, Co-op Gifu, Mikawa Citizens' Co-op, Mie Prefectural Citizens' Co-op, and Mie-kita Citizens' Co-op. The system begins as our customers collect printed material from their consumers. These materials are then recycled by paper manufacturers into our original paper products, whereupon we can process new products and deliver them to our customers. This system is proving very successful, registering a collection increase of approximately 40 tons in fiscal 1999.

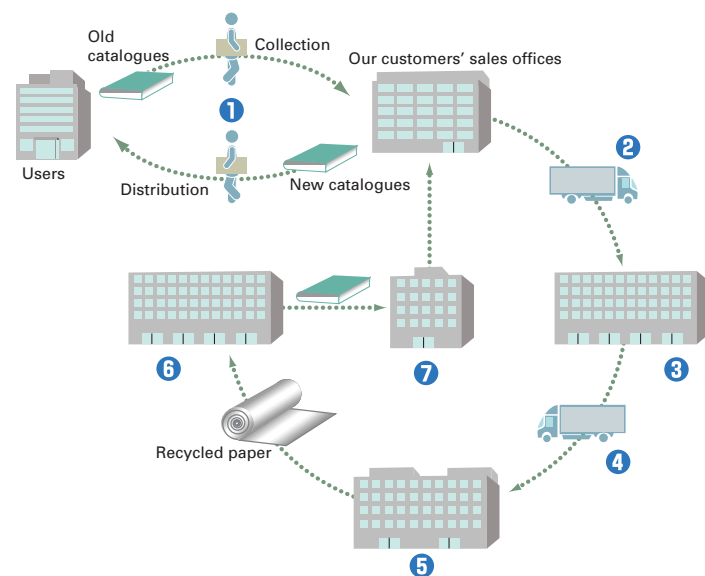
We are now examining the potential for future expansion into new business fields.

	FY1998	FY1999
Collected used paper	1,442 tons	1,481 tons

Creating a system for recycling



Collection and recycling of used paper



- 1 Our customers' sales offices collect old catalogues when distributing new catalogues
- 2 Product delivery trucks collect old catalogues from each sales office
- 3 Delivery to the customers' product-distribution centers
- 4 Gathered by used-paper collectors
- 5 Processed in the recycling plants of paper makers
- 6 Toppan prints on the recycled paper and uses it for new catalogues
- 7 New catalogues delivered to the customer

Educational and Awareness-raising Activities

System of Environmental Education

To enhance employee awareness regarding the environment, we educate new recruits and management staff on global issues and Toppan's own environmental conservation activities.

In addition, at each our business site, we provide localized training to their employees and report their progress at in-house environmental audits. In this way, we foster an understanding of various environmental issues and conservation activities.

Furthermore, we actively carry out over-all hierarchical training by lecturers within and outside the company in order to deepen the understanding of employees regarding ISO 14001.

Environmental education system

- Training for new recruits
- Training for new management staff
- Optional training: Toppan business school
- Self-education: Toppan challenge school
- Environmental education and awareness activities at each business site

Guidance and evaluation through in-house environmental audits



Training for office directors by the head of the Ecology Center

Toppan Group's environmental slogan for fiscal 2000:

We are Citizens of the Environment and the Earth. Environmental rules apply to everyone, everywhere, all the time.

Naoto Koyama, Administration Department, Toppan Research Institute

Toppan Group's environmental slogan for fiscal 2000

Environmental Awareness-raising Activities

Eco-protection case study meetings

A biannual presentation meeting is held for our environmental conservation activities, including energy savings and recycling at our offices and plants. This meeting exemplifies our progress through successful endeavors and enhances environmental awareness.

Environmental activity months

June is positioned as Environment Month, while February and August as Energy-Saving Months, so as to promote participation throughout the company. During last fiscal year's Environment Month, we sponsored a prize contest to select Toppan Group's environmental slogan, in which eight slogans were chosen from among 2,853 entries. During Energy-Saving Months, each business site redoubles its efforts on behalf of energy-conservation with added use of posters and slogans. The details of such activities are presented to other offices through activity reports prepared at the end of the month, in order that we might expand on our many successes.

In-house publications as well as Intranet and Internet web sites

Toppan uses in-house publications, its Internet web site, and other venues to discuss trends related to environmental issues and publicize the company's environmental efforts.



Ecology Awards

We added Ecology Awards in our biannual President's Awards and Divisional Awards as a means of stepping up employee efforts.



"Development of Toppan Green Paper 100," one of the winners of the fiscal 1999 Ecology Awards

Lectures

Toppan makes a consistent effort to enhance employee awareness by inviting outside experts to give lectures. We also offer talks by our own personnel, who give business lectures at our offices and plants.

Exhibitions

Toppan holds special exhibitions to introduce our efforts to customers, thereby raising the profile of our in-house awareness activities. For example, we held the Toppan Environmental Exhibition 2000 in Kansai last fiscal year, and also held the Toppan Fair 2000 in celebration of the company's 100th anniversary. Here, we positioned the exhibition of ecology zones as one of the main features of the fair as a means of conveying our corporate stance on environmental issues. (See page 30.)



Environmental Exhibition 2000 in Kansai

Information Disclosure and Communication

Preparation of Tools for Information Disclosure

Environmental labels

Corporate-wide environmental efforts can only begin and move forward with the change in each employee's awareness. Therefore, last fiscal year, Toppan created its environmental logo and placed it on our corporate publications as a means of raising

people's awareness. Furthermore, we specified that beginning in fiscal 2000, we would clarify in-house standards for environmentally preferable products and began applying "Toppan's labels on environmentally preferable products" to the samples and pamphlets of products that meet the standards. These endeavors have made our consideration of the environment clearly discernible. (See page 24.)



Environmental report

Toppan has been busy on behalf of environment-related information disclosure through the annual publication of its *Environmental Report*, which began in fiscal 1998. Moreover, we disclose information in newspapers and magazines and on our Web site so that not only environmental experts but also the

public can make use of it. However, there are still some types of information that are not sufficiently disclosed. In the *Environmental Report 2000*, every effort is made to disclose information concerning the environmental burdens we have generated, including the total volumes of waste discharge, energy consumption, air-pollutant emissions, and water consumption. We provided an explanation for every target that was not met. Beginning in fiscal 2000, we are requiring our ISO 14001-certified plants to prepare site-specific eco-reports directed toward their local municipalities and residents. Thus, we will continue enhancing our tools for environmental communication and the disclosure of information.

Environmental communication tools

- *Environmental Report 2000*
Japanese edition: 20,000 copies
English edition: 2,000 copies
- *Environmental Measures in Printed Media* 2,000 copies
- *Toppan Eco Movement* 2,000 copies
- Web site
Addressing Environmental Concerns/
ISO information
- Toppan's labels on environmentally preferable products
Applied to our authorized products (or their sales promotion tools) to appeal environmental claims of each product.

Indication of mark	Applicable items
 Toppan's environmental logo	Proposal Documents Environmental presentation materials, general proposals, etc. Pamphlets and corporate events The <i>Environmental Report</i> , general pamphlets, ecology exhibitions, etc. Corporate publications Corporate brochures and in-house publications Divisional publications Brochures and pamphlets issued by each division (division headquarter)
 Toppan's labels on environmentally preferable products	Sales promotion tools for environmentally preferable products Product pamphlets, samples, sample books, and tools

Toppan Fair 2000

To commemorate Toppan's 100th anniversary, we carried out redevelopment in the Koishikawa area, and in May 2000, completed the construction of the Toppan Koishikawa Building. Toppan Fair 2000 in Tokyo was held at this new building for a period of six days, April 17-22, 2000. "Environmental conservation" was taken up as one of the most important themes of the exhibit, together with other themes including electronics, Business technologies, and Business Innovation.

Toppan Fair 2000 featured panel displays explaining our basic philosophy on the environment, beliefs, and

efforts concerning corporate-wide environmental conservation, the development of environmentally preferable products, and the vision for our future direction. We also presented the environmentally preferable products from each of our business field and presented their underlying concepts.



Exhibition of environmental conservation



Exhibition site of Toppan Fair 2000 in Tokyo

Social Contributions and Outside Activities

Afforestation activities

Participation in afforestation operations

Considering our dependence on paper, not to mention the fundamental importance of afforestation, in January 1997, Toppan set up a joint corporation for afforestation in Australia with Oji Paper Co., Ltd., and Nissho Iwai Corporation. The company mainly plants early-maturing eucalyptus and other broadleaf trees. The joint corporation targets to cover an area of 10,000 hectares by the year 2007. Its principal target is to further the protection of the global environment through anti-CO₂ measures, as well as resource conservation for the future.



Afforestation activities in Australia (photo courtesy of Oji Paper Co., Ltd.)

Product sales to fund afforestation

Thanks to generous support from numerous beverage companies, we were able to reserve a portion of the profits from our Cartocan paper-based beverage container and donate it to the Forest Fund for afforestation in Indonesia. The donation was made by the Japan Environmental Foundation via the Global Citizens' Forest. We started this program in February 1999, and within a year had contributed nearly ¥3 million.



Cartocan and the Forest Fund logo

Promoting tree-free paper

As a member of the Treefree Fund Project, Toppan is working to increase the use of tree-free paper in printing, and thus enhance the protection of precious forest resources. In the Treefree Fund, 1% of the cost of tree-free paper is reserved as a fund for forest protection, which has since 1995 been granted to afforestation projects and NGOs. Then, in fiscal 2000, in response to requests from the Chinese government and related organizations, another grant will assist in afforestation activities throughout China.



Treefree logo

Harmony with the Local Community

To facilitate cohabitation with local communities, we are working to enhance our mutual communication through the promotion of greening on the premises of our plants and cleaning activities in the surrounding area. We also invite local residents and people from nearby welfare institutions to visit our plants. These endeavors are carried out in order to ensure a harmonious relationship with the communities in which Toppan is a participant.



Cleaning activities around plant premises



Plant visits by local citizens

We own approximately 3,000 m² of green space in the open area within the premises of our Koishikawa building, and in that area, there are approximately 200 tall trees and 30,000 shrubs. The space is open to the public, where employees and local citizens can relax on benches amid the quiet surroundings.



Public space on the premises of the Koishikawa building

Main Awards Received for Our Environmental Conservation Activities

- July 1991: Minister of International Trade and Industry's Award for Plants Distinguished in Greening Activities—Fukuzaki plant
- February 1992: Director's Award, Kanto Bureau of International Trade and Industry for Plants Distinguished in Energy Management—Itabashi plant
- February 1995: Encouragement Award, Saitama Prefecture Global Environment Awards—Toppan Graphics Co., Ltd.
- April 1996: Fuji Sankei Group Award, the Fifth Global Environment Awards
- February 1999: The Highest Award, Chairman's Awards, Committee on the Rationalization of Energy Consumption in the Kanto Region



Fuji Sankei Group Award (1996)

Environmental Accounting

Results for Fiscal 1999

Since fiscal 1999, we have been introducing methods of environmental accounting to ensure the efficiency of in-house environmental management and disclose of infor-

mation to the public. We have been able to do so through our comprehensive grasp of costs and cost-effectiveness concerning environmental conservation activities. According to the totals for fiscal 1999, the cost, effect, and proceeds from sales of valuables from recycling increased by ¥394 million, ¥1,125 million, and ¥318 million, respectively, in comparison with the fiscal 1998 levels. Meanwhile, the amount of capital investment decreased by ¥519 million. The jump in cost was due to the increased scale of production in our electronics operations. The major reasons for the effect

increase were the successful larger-scale energy conservation centered on the revision of day-to-day operations, and the increase in proceeds from our environmental businesses. Furthermore, the overall results are affected by the revised definitions for accounting items and the change in monetary sums due to the systematization of data collection.

Environmental accounting for fiscal 2000 covered Toppan Printing and its subsidiary plants.

Period covered: April 1, 1999, to March 31, 2000

(Unit: ¥1 million)

Item	Details of principal efforts	Capital investment	Cost
Costs			
(1) Environmental costs for controlling environmental impacts occurring within business area as a result of production or service activities (business area costs)		1,732	8,332
Breakdown	1) Pollution prevention costs	Investment and facility maintenance costs for preventing pollution	(936) (2,820)
	2) Global environmental protection costs	Investment and running costs for global environmental conservation	(434) (2,002)
	3) Resource circulation costs	Investment and running costs for waste processing and recycling	(362) (3,511)
(2) Costs for controlling environmental impacts occurring in the upstream or downstream associated with production or service activities (upstream/downstream costs)	Expenses for "green purchasing," recycling of container packaging, defrayal to business associations, etc.	-	242
(3) Environmental costs in management activities (management activity costs)	Expenses for environmental education awareness-raising activities, acquisition of certification, and maintenance of the environmental management system, monitoring and measurements of environmental burdens, defrayal to environmental organizations, etc.	2	401
(4) Environmental costs in research and development activities (research and development costs)	Cost for research and development of environmentally preferable products, etc.	78	1,694
(5) Environmental costs in social activities (social activity costs)	Expenses for promotion of afforestation at business sites, environmental information disclosure, environmental advertisements, etc.	54	176
(6) Costs corresponding to environmental damages (environmental damage costs)	-	-	-
Total		1,867	10,846
Effect			
(1) Energy conservation			162
(2) Environmental business			4,598
Total			4,760

Item	Details	Amount
Proceeds from sales of valuables regarding 3) in (1)	Sales proceeds as a result of recycling	1,402
Total amount of investment for the period covered	Total amount of capital investment	66,056

(As figures have been rounded down to one decimal place, some totals may not correspond to the actual sums.)

Calculation standards for Toppan's environmental accounting

Environmental accounting was conducted in conformance with the May 2000 publication of *Developing an Environmental Accounting System (Year 2000 Report)* by the Environment Agency of Japan. However, to determine the costs for appropriate waste processing and recycling, we used the amount obtained after deducting the proceeds from sales of valuables from recycling. The "Effect" section of the above table covered only the areas that can be reliably

accounted for in monetary terms. For energy conservation, the posted amount—converted to an annual sum—refers to the effect of saving through investment in or remodeling of energy-saving facilities. For environmental business, the posted amount was obtained by multiplying the sales proceeds from environmentally preferable products by the ratio of gross profit to net sales.

Future challenges

Toppan will continue its disclosure of

annual environmental accounting results and will work to bring more efficiency to our environmental management so that the results can be reflected in corporate management. We will therefore continuously improve our accounting method by enhancing data accuracy via the clarification of cost-related entries and definitions of effect. Moreover since we are planning to introduce consolidated environmental accounting, we will work out the appropriate time and details thereof.

Glossary

Recyclable resources

A term defined by the Basic Law for Establishing the Recycling-based Society, made in reference to certain types of "waste and others" that could still be useful. "Waste and others" is defined as any waste that may or may not retain value. The definition of "recyclable resources" was made in order to promote their use through recycling.

Unit energy consumption

This term represents the total volume of energy, such as electricity and fuel, needed to produce a certain unit of products. It is indicated by the percentage obtained by dividing the energy consumption volume by plant output or production volume and multiplying it by 100, and is used numerically to show the degree of energy efficiency.

Unit landfill disposal volume

This term represents the total volume of landfill disposal, as generated through the manufacture of a certain unit of products. It is indicated by the percentage obtained by dividing the landfill disposal volume by plant output or production volume and multiplying it by 100, and is used to numerically show the degree of effective resource use.

Environmental management system/ISO 14001

A part of the corporate management system, it includes regulations and standards that govern organizational structures, systems for defining positions of responsibility and authority, operations and procedures, processes, and management resources in order to prepare, implement, achieve, revise, and maintain environment-related plans. The ISO (International Organization for Standardization) established ISO 14001, an international standard for environmental management system in September 1996.

Specific CFCs

The types of fluorocarbons defined in 1987 as targets of reduction in the Montreal Protocol on Substances that Deplete the Ozone Layer.

CFC substitutes

Substances used as replacements for chlorofluorocarbons (specific CFCs) to prevent depletion of the ozone layer, including hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs). However, a problem remains regarding the coefficients of global warming effects in some HFCs, which are still high.

Greenhouse gases

The term "greenhouse gases" refers to the types of gases such as CO₂ that absorb infrared rays emitted from the Earth's surface as it is heated by solar radiation, and accumulated in the atmosphere as thermal energy.

"Green purchasing"

The term "green purchasing" refers to purchasing actions that take into account environmental burdens caused by the goods or services concerned, in addition to their costs and quality, and gives priority to those posing less environmental threat. While the term is often used with respect to office supplies, etc., "green procurement" is used for parts and materials used in plants, in order to differentiate the two actions.

Electrostatic precipitator

Such equipment for the prevention of pollution is mainly used to remove toxic substances contained in exhaust gases. Here an electrode is placed amid exhaust gas and high electric voltage is applied to cause corona discharge, which in turn removes toxic substances present the gas through adsorption via the negative ions generated in the process.

Scrubber

Equipment for pollution prevention, used for a purpose similar to that of the electrostatic precipitator. It absorbs toxic substances by passing the gas through a wash liquid. Similarly, it could also remove dust and other particulates, but it would have to be accompanied by a large volume of water, as well as by facility that treats water containing toxic substances.

SO_x and NO_x

SO_x is an appellation for SO₂, SO₃, and sulfuric acid mist, the types of sulfur oxides generated through the combustion of fuels containing sulfur, such as heavy oil and gasoline. NO_x refers to NO and NO₂, the types of nitrogen oxides generated in fuel combustion. SO_x and NO_x are known sources of air pollution.

Cogeneration system

A system that utilizes waste heat immediately after it is generated by an engine, gas turbine, fuel cell, etc., for use as a heat source or for heaters. This can produce an improvement in energy-efficiency by as much as 75–80%.

PRTR

An abbreviation for "Pollutant Release and Transfer Register," a system of data registration and disclosure concerning the volume of toxic chemical substances released to the environment and its transfer volume contained within waste. The system was written into legislation via the Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (provisional translation by Environmental Agency of Japan) which was approved on July 7, 1999, by the Diet and promulgated on July 13 of the same year.

Zero-emissions program

A program to reduce the amounts of waste disposal generated in corporate and production operations to a point as close to zero as possible.

RPF

An abbreviation for "Refuse Paper and Plastic Fuel," referring to solid fuel compounds consisting of paper and plastic. Using a process of agitation and solidification, wastepaper and plastic are combined and made into a stable form of heating fuel. This process also helps reduce cinder volume.

Glossary

Thermal recycling

A method of energy reuse by collecting energy discharged from waste incinerators and using it as a heat source for heating systems in plants.

Material recycling

A method of waste recycling that reuses waste as a raw material.

Manifest

The term “manifest” refers to a control manifest for industrial waste. When a company consigns a third party to transport, process, or dispose of industrial waste, the company then determines whether the waste was transported, processed, or disposed of according to the prior agreement, by consulting the manifest.

Absorption refrigerating machine

This is a refrigerating system that uses a water coolant, as it poses a high degree of latent heat upon vaporization, and methyl bromide, as an excellent liquid absorbent of the vapor generated through the refrigeration process. This system is increasingly drawing attention as a substitute for fluorocarbon-based refrigeration systems.

Ice thermal storage system

A system of heat storage, it runs heat-source equipment at night and converts the cooled water into ice. The ice is then stored in a thermal storage tank, and the heat is used in the daytime for air conditioning.

TPM operation

An abbreviation for “Total Productive Maintenance.” This is an operation conducted to prevent any loss in the production system, in order to achieve an optimal efficiency.

LCA

LCA is an abbreviation for “Life Cycle Assessment,” a method used to evaluate the environmental impact of a product through the quantitative analysis of environmental burden generated over its whole lifecycle. A product lifecycle spans collection of raw materials, materials

manufacturing, parts manufacturing, production of the finished product, distribution, sales, use, and disposal. ISO 14040, which is intended to provide a clear overview of the practice, applications and limitations of LCA, was published in June 1997.

Product assessment

This term refers to action taken by a manufacturer regarding evaluations of environmental impact, safety, etc., for a given product in the planning-and-design stage, in order to reduce any negative environmental effect.

Inventory database

A database containing information on the environmental burden imposed by a product evaluated by LCA, including resource and energy consumption with respect to raw materials and others, as well as CO₂ emissions.

Supply chain management

This term refers to a new management method that covers all the operations of a business by computer, from the “upstream” through the “downstream” flow of business operations. When order data is entered, all the related sections can share the same data, thus leading to the most suitable procurement, production, and distribution of the product ordered.

POP

An acronym for “Point of Purchase,” POP refers to sales-promotional advertisements and tools that are used in places where consumers buy the respective products. There are various types of POPs, depending on the purpose and application, such as information dissemination and product presentation. Examples include life-size displays, sales counters, and eye-catchers.

The Containers and Packaging Recycling Law

Its official name is the “Law Concerning Promotion and Others of Separated Collection and Recycling Regarding Containers and Packaging.” It took effect in April 1997 regarding glass and PET bot-

tlers, and is ultimately intended to ensure mutual cooperation and responsibility sharing by consumers, local municipalities, and industries for the recycling of “containers and packaging waste.” Beginning in April 2000, it also applies to containers and packaging made from paper and plastic.

Tree-free paper

This term refers to paper made from resources other than wood pulp, e.g., sugarcane pomace (bagasse) and annual plants belonging to the Malvaceae family (kenaf). Efforts to manufacture paper using resources other than wood pulp are being expanded in consideration of environmental conservation.

Soy ink

The term “soy ink” refers to printing ink with a portion of its petroleum-solvent content substituted by soybean oil. It generates a lower amount of VOCs (volatile organic chemicals), which are known as air pollutants, than standard ink. Soy ink is also suitable for recycling, since it can be easily removed from the paper material.

Recycled vegetable-oil ink

This is ink made by substituting soybean oil with recycled vegetable-oil that was used in school lunches and by the dining industry.

Environmental accounting

Environmental accounting is a system designed to apprehend an accurate status of investments relating to environmental conservation and its associated cost-effectiveness, neither of which could be reflected in conventional accounting practices. The introduction of environmental accounting methods allows a company to comprehend its environmental conservation efforts in a quantitative manner, and thereby enhance the cost-effectiveness of its environment conservation in its operations.

Please send us your suggestions and comments.

Toppan Printing, being blessed by the Earth's bounty, has prepared this edition of the *Environmental Report* to address issues on global environmental conservation and thereby deepen the reader's understanding of our related activities. The report summarizes those activities by posting specific figures and examples, but we are nevertheless aware that in certain respects there is more we can achieve. Accordingly, we ask for your suggestions and comments so that we can reflect them in our activities and the content of future editions of the *Environmental Report*. Please take a moment to fill in the questionnaire on the back and fax it to our Ecology Center.

December 2000
Ecology Center
Toppan Printing Co., Ltd.

Please fill in the questionnaire and fax the sheet to:

+81-3-3835-0847 (Ecology Center, Toppan Printing Co., Ltd.)

Q1 What did you think of the *Environmental Report* ?

Readability of the Report

- 1) Our opinions concerning the global environment Easy to understand Average Hard to understand
 2) Descriptions of our activities Easy to understand Average Hard to understand

Content of the Report

- Sufficient Average Insufficient

Which theme(s) in the *Environmental Report* left you with a particularly strong impression?

1. Toppan and the environment 2. Toppan's environmental philosophy 3. Environmental management structure and system
 4. Environmental action plan 5. Environmental targets and achievements 6. Environmental management system
 7. Prevention of pollution 8. Waste management 9. Realizing the zero-emissions target 10. Energy and resource savings
 11. Office eco-protection 12. Efforts in product distribution 13. Designation of environmentally preferable products
 14. Efforts in Toppan's business fields 15. Development of environmentally preferable products
 16. Partnerships in creating a recycling-oriented society 17. Educational and awareness raising activities
 18. Information disclosure and communication 19. Social contributions and outside activities 20. Environmental accounting

Answer

What did you think of our efforts to address environmental issues when you read about them in this edition of the *Environmental Report* ?

How do you evaluate our efforts? And for what reason(s)?

- Excellent Good Average Mediocre Poor

(Reason(s))

Please include your suggestions or comments regarding the report or our environmental activities.

Q2 From what perspective did you read this report?

1. Specialist on the environment 2. Corporate employee in charge of the environment 3. Staff in public administration
 4. Shareholder or investor 5. Student 6. Journalist 7. Resident in the vicinity of our business site
 8. Member of an environmental NGO 9. Other ()

Answer

Q3 How did you come to know about this report?

1. Toppan's Web site 2. Newspaper 3. Magazine 4. Our sales representative 5. Friend or acquaintance
 6. Other ()

Answer

Thank you very much for your cooperation. At this time we would like you to tell us a little about yourself:

Name:	Sex:	Age:
Address:	Phone:	
Occupation/Corporate name:	Dept./Title:	

Toppan's Environmental Chronology

Beginning with the installation of recovery equipment for organic solvents in the 1960s, Toppan embarked on a series of pollution-prevention measures that extended through the 1980s. Through these mediums, we considered the details and degrees of pollutant generation at each of our plants. Back in 1971, under the leadership of our head office, we began auditing operations to broaden and improve the management of pollution prevention. Between 1972 and 1977, we pioneered industrial

waste recycling operations by developing an artificial fish reef to utilize waste plastic, and by actually installing this system on the seabed in dozens of locations throughout Japan.

The movement toward global environmental conservation became widespread in the 1990s, and accordingly, the range of issues expanded. In 1991, we established the Ecology Center to refine our overall stance and system of environmental management. The role of the Ecology Center is

to perceive the environment from multiple angles and to direct corporate-wide environmental operations. A key effort in the refinement of this system was the introduction of the In-house Environmental Audit System an update of our traditional method as a means of preparation for future international standardization of environmental management. In July 1998, our Shiga plant (Electronics Division Headquarters) obtained ISO 14001 certification, a first for toppan.

