RICOH
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RICOH GROUP ENVIRONMENTAL REPORT 2000

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Message from the President

The rich resources of our planet Earth have given birth to many forms of life and have supported the broad-ranging and ambitious activities of mankind. Nevertheless, recent human activities that have exceeded the healthy limits of resource usage have adversely impacted this life-sustaining ability of the Earth. Not only does this pose a threat to our coexistence with other life on Earth but it also threatens the future of the human race itself.

In order to bequeath a strong and bountiful Earth to future generations, each of us must reduce the environmental impact of our activities. For that to happen, governments, companies, citizen groups, and even individuals must be aware of the environmental impact that has been placed on the Earth and actively seek to reduce it. Mutual consultation and co-operation are also critical for efficient environmental conservation.

For the Ricoh Group, safeguarding this precious planet Earth is one of our corporate missions, and the environmental conservation activities of the entire Group are a part of our management philosophy. Specifically, we believe that the following two ideas are crucial: (1) we must reduce the environmental impact of our products, and (2) we must reduce the environmental impact of all of our corporate activities, including development, production, sales and services, used-product recovery, and recycling.

To survive in the next century, a company needs to be more environmentally oriented and carry out more socioeconomic practices. We have been through a period of Passive Stage, in which we simply dealt with regulations, and a period of Proactive Stage, in which we voluntarily took measures to reach higher goals in conserving the global environment. We are now in a period of Responsible Stage, in which we are increasing our economic value as a company to continue such activities. We need to aggressively appeal to society in helping decrease the overall negative impact on the environment while working with communities and citizen groups in activities that contribute to the environment. We also need to provide proper disclosure so that our customers will be able to see how we are pursuing appropriate environmental conservation activities. In this way, we will actively help build a society that recirculates resources, which is essential to environmental conservation, and contribute to the continued existence of mankind.

This report, which is publicly available, summarizes the details and results of our environmental conservation activities during fiscal 1999. We hope that this report will help as many of you readers as possible in discovering the extent of Ricoh Group's environmental measures. We also welcome your honest opinions to further improve our activities in terms of both quality and effectiveness.

Masamitsu Sakurai
President and Chief Operating Officer
Ricoh Co., Ltd.

桜井正光

Corporate Philosophy

The Spirit of Three Loves

Love your neighbor
Love your country
Love your work

Management Philosophy

Our Purpose

To constantly create new value for the world at the interface of people and information.

Our Goal

To be a good global corporate citizen with reliability and appeal.

Our Principles

To think as an entrepreneur.
To put ourselves in the other person's place.
To find personal value in our work.

Ricoh's Code of Conduct

The list given below is Ricoh's Code of Conduct, which reveals Ricoh's attitude toward laws and corporate information and its relationship with society and employees. The stances and courses of action that all employees are expected to take are also listed. Ricoh Group companies formulate and enforce their own codes of conduct pursuant to this list.

1. Ricoh's Basic Attitude

(1) Conduct sound business activities.
1) Aim toward stable growth and development.
2) Comply with social ethics and normal business practices.

(2) Promote mutual understanding with society.
1) Respect different cultures and practices.
2) Sincerely promote public relations.

(3) Support activities that contribute to society.
1) Engage in activities that contribute to local communities.
2) Create a corporate culture in which activities that contribute to society are encouraged.

(4) Respect the global environment.
1) Address environmental issues in a positive manner.
2) Manufacture products that are environment friendly.
3) Keep the prevention of pollution and the conservation of energy in mind.
4) Product recycling
5) Strive to maintain and improve the environment.

2. Employee Responsibility

(1) Ricoh's expectations of employees
1) Employees will comply with laws and regulations.
2) Employees will be civil.
3) Employees will act like responsible representatives of Ricoh.
4) Employees will improve customer satisfaction.
5) Employees will show initiative and creativity.
6) Employees will consider the other person's point of view.
7) Employees will align individual satisfaction with company growth.

(2) Respect basic human rights.
1) Abolish discrimination.
2) Protect individual privacy.

(3) Provide a work environment in which individual capabilities can be demonstrated.
1) Provide opportunities for self-fulfillment.
2) Respect the particular skills of others.
3) Give objective and fair performance evaluation.
4) Create a comfortable work environment.

3. Guidelines for Fair Corporate Activities

(1) Compliance with the Antimonopoly Law
1) Such meeting or agreement should not be held or made that restricts each other's free business activities.
2) Trading advantage should not be used.
3) Misleading indication should not be made and excessive premiums or prizes should not be offered.

(2) Compliance with Export-Related Laws
1) Prior verification
2) Careful judgment
3) Verification based on document

(3) Entertainment and gifts
1) Compliance with generally accepted business practices
2) Entertainment or gift should not be offered to officials of public organizations (including former officials).

(4) Transactions with public organizations and political contributions
1) Transactions in strict compliance with related laws
2) Illegal political contributions should not be offered.

4. Guidelines for Protecting Corporate Information

(1) Trade secrets*
1) Conformance to control regulations
2) Authorized disclosure
3) Corporate information should not be used for a private purpose.
4) Corporate information should not be obtained by illegal means.

* The term "trade secrets" refers to corporate information with asset value that has been created or obtained through normal business activities.

(2) Insider information*
1) Insider information should not be disclosed to any third party.
2) Insider information should not be used for private purposes.

* The term "insider information" refers to important internal information concerning unannounced increases or decreases of capital, new products, business tie-up, etc.

(3) Intellectual property*
1) Prompt report to the company
2) Respecting intellectual property of third parties
3) Comforming to disclosuring procedures

* The term "intellectual property" refers to patents, utility model rights, designs, trademarks, copyrights, rights of layout-designs of integrated circuits, trade secrets, etc.

Established April 1, 1993 Revised December 1, 1995

◎Scope of this Environmental Report

This report describes the environmental conservation activities of the Ricoh Group in fiscal 1999. The report covers only fiscal 1999 (from April 1999 to March 2000); however, it does include such fiscal 2000 information as goals. The environmental impact data has been gathered from the following major Ricoh production, nonproduction bases and Ricoh Group manufacturing subsidiaries.

●Scope of Collection and Inclusion of Environmental Impact and Environmental Accounting Data

Japan

Ricoh production bases:
Ricoh Atsugi, Ricoh Hatano, Ricoh Numazu, Ricoh Gotemba, Ricoh Fukui, Ricoh Ikeda, Ricoh Yashiro

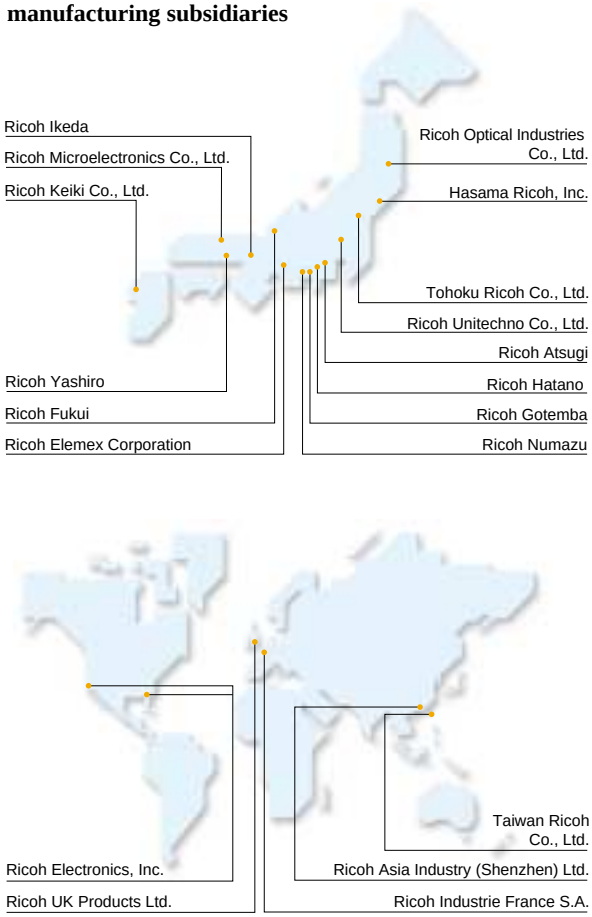
Ricoh nonproduction bases:
Ricoh Aoyama Head Office, Ricoh Omori, Ricoh Omori Office No. 2, Ricoh Ginza, Systems Center, Ricoh Shin-Yokohama, Service Parts Center, Central Research Institute, Software Laboratory, Toda Technology Center, Applied Electronics Laboratory

Ricoh Group manufacturing subsidiaries:
Tohoku Ricoh Co., Ltd.; Hasama Ricoh, Inc.; Ricoh Unitechno Co., Ltd.; Ricoh Optical Industries, Co., Ltd.; Ricoh Keiki Co., Ltd.; Ricoh Microelectronics Co., Ltd.; Ricoh Elemex Corporation

Overseas

Ricoh Electronics, Inc. (North America); Ricoh UK Products Ltd. (U.K.); Ricoh Industrie France S.A. (France); Ricoh Asia Industry (Shenzhen) Ltd. (China); Taiwan Ricoh Co., Ltd. (Taiwan)

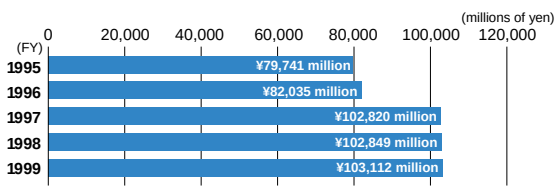
Major Ricoh production bases and Ricoh Group manufacturing subsidiaries



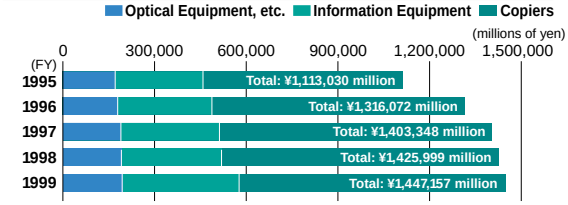
◎Summary of Ricoh Group Businesses

The Ricoh Group engages in the developing, manufacturing, selling, and after-sales and other related services of office equipment (copiers and information equipment) and other equipment (optical devices) both domestically and overseas.

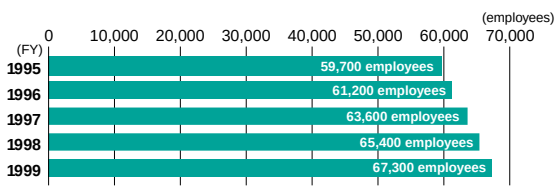
Change in Ricoh Group's Capital*



Ricoh Group's Sales Classified by Business*



Change in the Number of Ricoh Group's Employees*



*Figures are from Ricoh Group's securities report and, accordingly, may differ from those of the environmental impact data.

Ricoh General Principles on the Environment

Basic Policy

Based on our management principles, we recognize environmental conservation as one of the most important missions given to mankind, and we regard environmental conservation as an integral element in all our business activities. We, therefore, assume responsibility for environmental conservation and approach this on a companywide basis.

Action Guideline

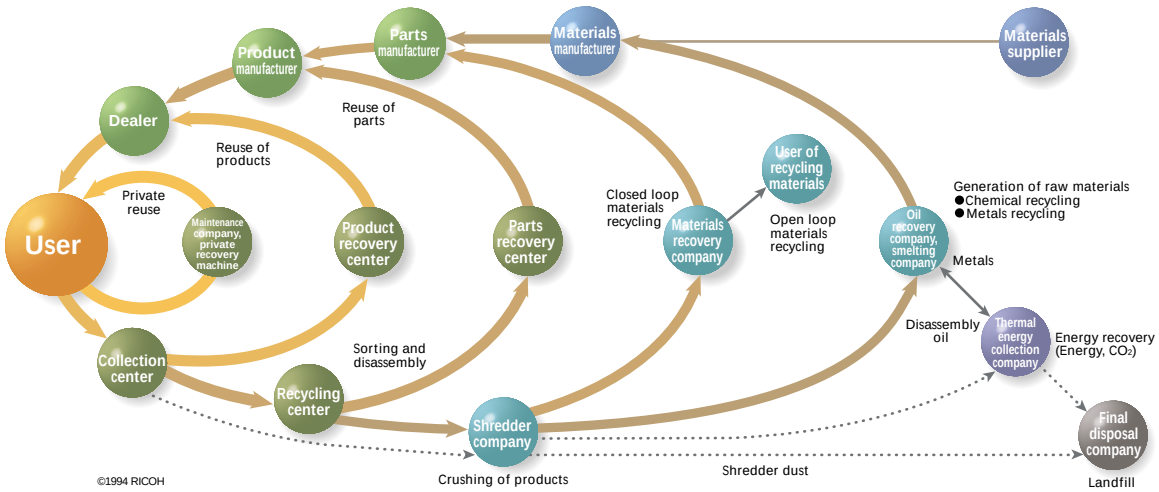
1. Not only do we comply with all domestic and overseas environmental regulations, but we also set our own targets to reduce stress on the environment in consideration of social expectations, and we endeavor to attain our targets.
2. We strive to promote technological innovation while at the same time maintaining and improving our environmental conservation systems.
3. In development, design, and operation of factory facilities, we always consider their impact on the environment, and we strive to prevent pollution, to utilize energy and resources effectively, and to reduce and dispose of waste in a responsible manner.
4. At every stage, from planning, development, design, procurement and production to sales, logistics, use, recycling, and disposal, we offer products and services which have minimal environmental impact and give maximum consideration to safety.
5. Through environmental education, we strive to raise awareness of all our employees in order to develop a social viewpoint that enables them to conduct environmental activities under their own responsibility.
6. In every country and region where we conduct our business, we maintain close ties with the local communities and we contribute to society by publicizing our activities and assisting in environmental conservation activities.

Established in February 1992 Revised in April 1998

The Ricoh Group's Concept of Environmental Conservation Activities (The Comet Circle™)

The Ricoh Group is helping build a society that recirculates resources through its environmental conservation activities. However, for a society to be highly sustainable, it must first be capable of effective production using minimum resources. The Comet Circle represents a resource-recirculating society that manufactures products that are designed to be eventually recycled. We strive to make the resource recirculation loops of the Comet Circle smaller at all stages by being more efficient, using fewer resources, and reducing environmental impact.

Concept for Realizing a Society that Recirculates Resources: The Comet Circle™



● Determine and Reduce Environmental Impact at All Stages

To minimize the environmental impact caused by society, the Ricoh Group, suppliers, customers, and recycling companies must first determine the degree of environmental impact at all stages, including the transportation stage, and then reduce it using the latest technologies and recycling systems.

● Priority Inner Loop Recycling

Resources have the highest economic value when those resources are manufactured into products and used by customers. The Ricoh Group focuses on recycling and reuse in the inner loops of the Comet Circle, aiming at minimizing the resources and energy costs needed to return used products to their highest economic value.

● Promotion of a Multitiered Recycling System

Repeated recycling to the furthest extent possible (i.e., multitiered recycling) reduces resource consumption and waste generation. The Ricoh Group's goal is to reduce waste in landfills to zero.

● Economically Rational Recycling

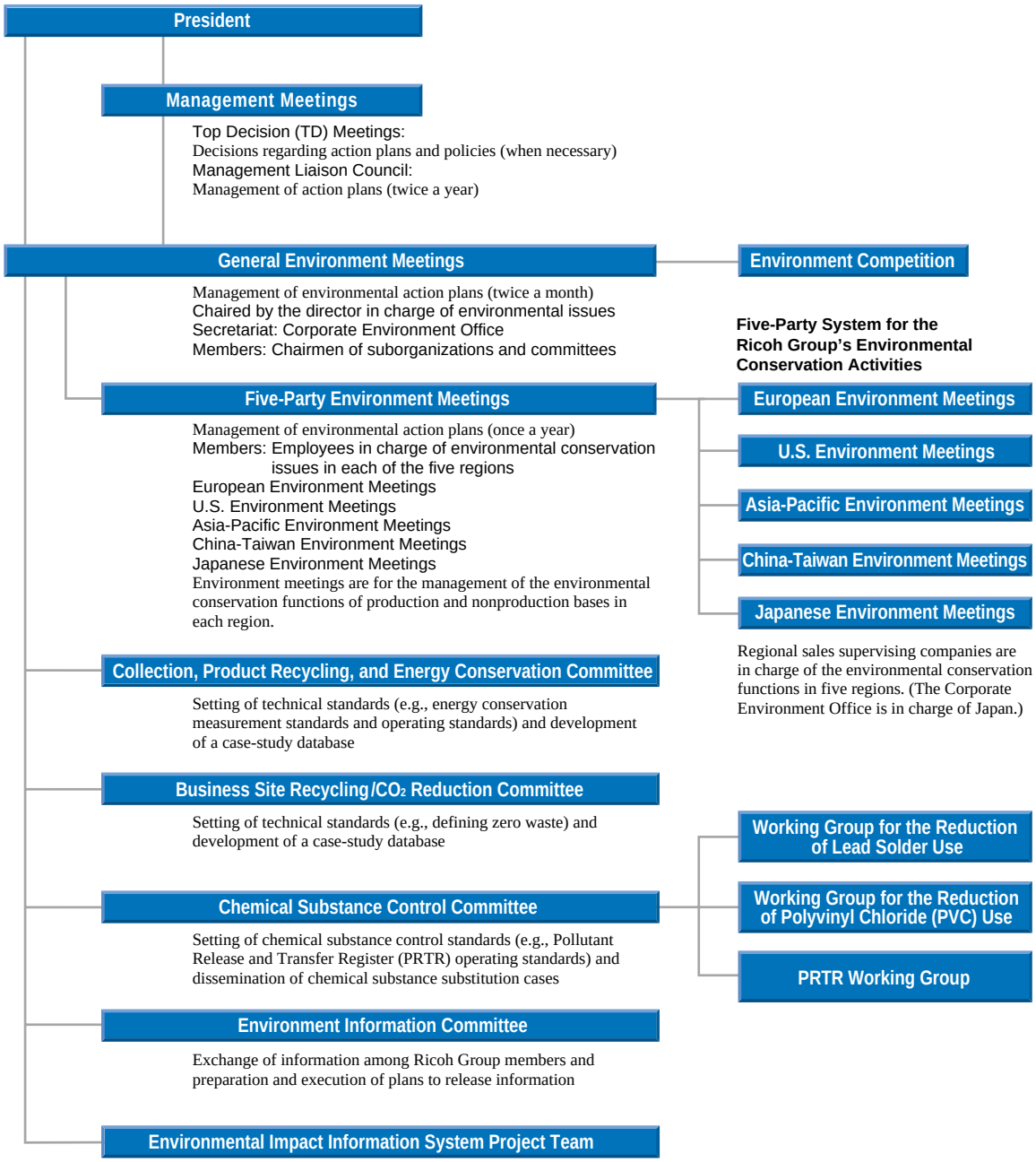
Economic rationality is indispensable in building a society that recirculates resources. Specifically, it is necessary to establish a recycling system in which the products and money flow in opposite directions. The Ricoh Group's recycling-oriented design reduces recycling costs. Another important part is the establishment of a system that evaluates recovered and recycled products and offers preferential purchases.

● Partnerships at Every Stage

The Ricoh Group is limited in what it can do to reduce the environmental impact caused at each stage of production. Significant reductions in environmental impact can be brought about in an economically rational way only through the cooperation of materials and parts manufacturers, customers, and recycling companies, among others, at all stages.

Ricoh Group Environmental Activity Promotion System

The Ricoh Group promotes environmental conservation activities of the whole Group based on the following system.



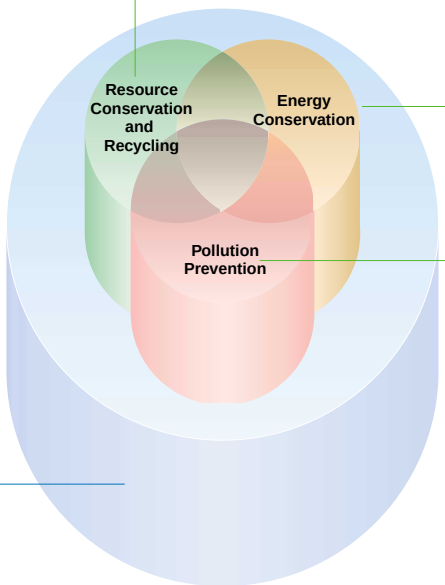
As of March 2000

Basis and Areas of Environmental Conservation Activities

The Ricoh Group regards the environment and management as having the same axis, and trys to achieve “environmental management” with high economic efficiency.
The Ricoh Group has introduced a variety of tools, including Eco Balance analysis, an environmental management system, and an environmental accounting system, to help carry out environmental management.
Environmental management allows us to promote efficient environmental protection activities in three areas: resource conservation and recycling, energy conservation, and pollution prevention.

Basis

- Eco Balance Environmental Impact Analysis: pp. 11–12
- Progress in Environmental Action Plans: pp. 13–14
- Environmental Management System: pp. 15–16
- Environmental Management Information System: pp. 17–18
- Environmental Technology Development: pp. 19–20
- Green Partnership: pp. 21–22
- Environmental Education and Awareness Promotion: pp. 23–24
- Health and Safety: pp. 25–27
- Social Contribution toward Environmental Conservation: pp. 28–30
- Environmental Accounting: pp. 31–34
- Environmental Communication: pp. 35–36



Area

- Resource Conservation and Recycling (Products): pp. 37–42

We are developing products based on recyclable designs, constructing a recycling system, and manufacturing products using recycled parts.

- Resource Conservation and Recycling (Business Sites): pp. 43–46

At our plants, we are striving to achieve “complete production,” i.e., getting maximum results using minimum resources with zero waste.

- Energy Conservation (Products): pp. 47–48

To prevent global warming, we are developing and offering various energy-saving devices.

- Energy Conservation (Business Sites): pp. 49–50

Because energy is also a resource, we are promoting its efficient use as well.

- Pollution Prevention (Products): pp. 51–52

We are promoting the strict control of chemicals used in our products to reduce and eventually eliminate the use of toxic substances.

- Pollution Prevention (Business Sites): pp. 53–54

In the area of manufacturing, the Ricoh Group is striving to reduce harmful emissions, waste, and the use of toxic substances.

From Passive Stage and Proactive Stage to Responsible Stage

To become a company that is indispensable to society in the 21st century, “environment” is a necessary keyword. However, companies will not be able to survive if they engage in environmental conservation activities at the expense of economic efficiency. Looking at past trends in environmental issues and the Ricoh Group’s responses to those trends, we see that the first period it faced was one of Passive Stage, in which the Group responded to laws and regulations and customer needs. The next period was one of Proactive Stage, in which we, as global citizens, voluntarily engaged in continuous efforts to reduce negative environmental impact. Today, we are aiming for Responsible Stage and high economic efficiency, giving the same weight to both. The Ricoh Group’s comprehensive environmental management includes zero waste plants, with proven economic benefits; recycling businesses, with economic benefits expected in the near future; and other areas, with economic benefits that are currently under study. We were among the first in implementing activities that responded to Passive Stage, Proactive Stage, and Responsible Stage.

1) Eco Balance Environmental Impact Analysis: pp. 11–12

The Eco Balance system is used to analyze the environmental impact of all business activities. It is capable of quantitatively analyzing the degree of negative environmental impact our business activities have. Accordingly, we fix effectively any business activity that shows a greater-than-acceptable impact.

2) Establishment of Environmental Action Plans: pp. 13–14

Environmental action plans are drafted to effectively lessen the environmental impact indicated by Eco Balance analysis. The cost-effectiveness of implementing environmental measures is examined in segment environmental accounting, which is used in making decisions in environmental management.

3) Environmental Improvement Activities: pp. 15–30

In order to realize and succeed with any environmental action plan, we promote environmental technology and green procurement, and promote the use of such tools as the environmental management system; thus we can reduce the environmental impact and total costs. We have taken this further by endeavoring to promote employees’ awareness by such means as adding the item “environment” to the performance assessment of various areas.

- Environmental Management System: pp. 15–16
- Environmental Management Information System: pp. 17–18
- Environmental Technology Development: pp. 19–20
- Green Partnership: pp. 21–22
- Environmental Education and Awareness Promotion: pp. 23–24
- Health and Safety: pp. 25–27
- Social Contribution toward Environmental Conservation: pp. 28–30

4) Environmental Accounting: pp. 31–34

Environmental accounting is a tool to check the success or failure of an environmental conservation activity in terms of environmental costs, changes in environmental impact, and economic benefits. It is also a decision-making tool for environmental management. This accounting system is a part of Ricoh’s regular accounting system.

5) Environmental Communication: pp. 35–36

Our efforts in environmental conservation activities can be seen in our environmental report and on our environment labels. To promote further autonomous and continuous environmental conservation activities, it is of the importance to gain the support of stakeholders through information disclosure.

Eco Balance Environmental Impact Analysis

◎Concept of Environmental Impact Analysis

The Ricoh Group considers an important prerequisite to environmental conservation activities to be the measurement of the environmental impact of our business activities based on the Comet Circle. For this purpose, we introduced the Eco Balance system and life cycle assessment (LCA). To more effectively reduce environmental impact, the Eco Balance system identifies environmental impact caused by each business activity, such as manufacturing and the procurement of materials and parts, while LCA elaborately identifies and analyzes the environmental impact made by each process and each product throughout its life cycle.

●The Eco Balance System*

The Ricoh Group's environmental action plans are the end results of the Eco Balance system. This system begins with the identification of the environmental impact made by all parties involved in the Comet Circle, from materials and parts manufacturers and the Ricoh Group itself to customers and recycling companies. Next, a plan of action to reduce the stronger environmental impact caused by all parties and processes is prepared.

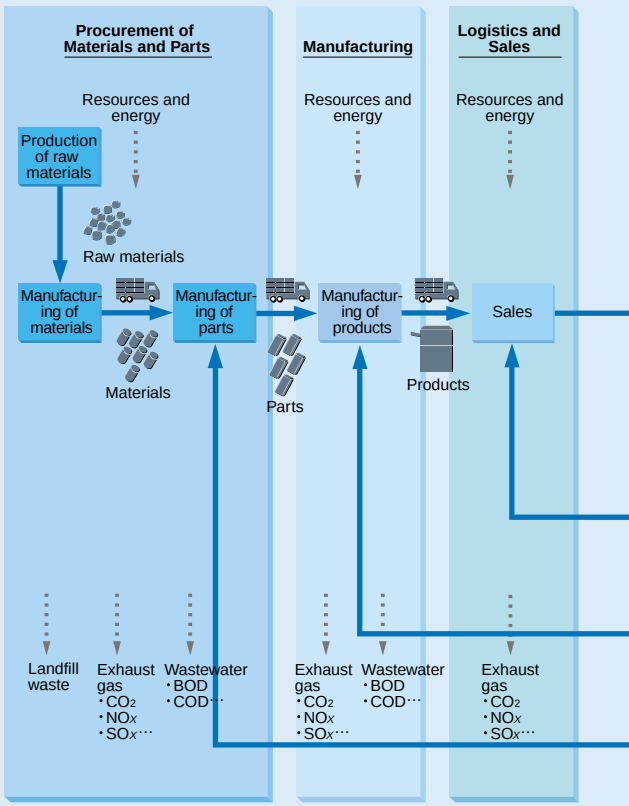
* The Eco Balance system involves the listing of environmental impact input/output data to identify, quantitatively measure, and report the environmental impact made by companies.

●Product LCA[1]

Product LCA is a means of quantitatively identifying the environmental impact made by a product throughout its life cycle and identifying what influences a change in design or manufacturing process would have. The environmental impact data collected from specific areas and used in product LCA are more accurate than those used in the Eco Balance system. Ricoh also conducts research on LCA[2].

1. LCA is a means of quantitatively determining the level of environmental impact generated throughout a product's life cycle, from resource procurement to manufacturing, transportation, usage, maintenance, recovery, recycling, and disposal. Even a partially determined level of impact can be used.
2. See page 20.

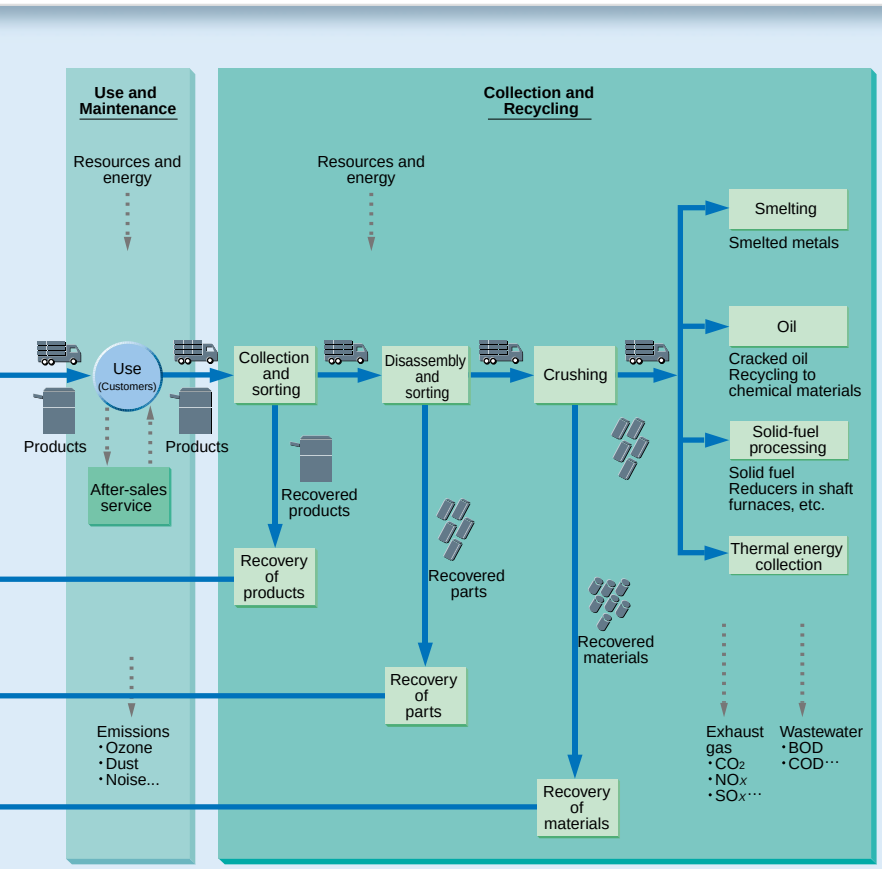
Eco Balance of Overall Corporate Activities



LCA of the imagio MF 6550 (Type III Environmental Impact Disclosure)*

Environmental Impact Item			Preliminary Process	Manufacturing	Transportation
Input		Power (kWh)	7730(MJ)	29.1	0
		Fossil fuel (MJ)		89.4	381
	Water usage	Tap water (ℓ)	—	10.7	0
		Industrial water (ℓ)	—	0	0
		Underground water (ℓ)	—	0	0
	Resource input	Principal resource (kg)	—	Metal 116 Plastic and rubber 38.8 Glass 2.2 Others 45.1	0
		PRTR substances (g)	—	72.2	0
		Volatile organic substances (g)	—	0	0
Output	Emission into air	CO_2 (kg-C) Power consumption/others	250	4.63/1.72	0/7.0
		SO_x (g) Power consumption/others	3460	7.86/8.58	0/31.5
		NO_x(g) Power consumption/others	711	9.89/5.49	0/79.2
		PRTR substances (g)	—	0	0
		Volatile organic substances (g)	—	0	0
	Water discharge	Amount (ℓ)	6560	10.7	0
		BOD (g)	7570	0.58 or less	0
		COD (g)	—	0.40 or less	0
		PRTR substances (g)	—	0.0129	0
	Recovered resources (kg)		—	1.44	14.9
	Waste	Incineration (kg)	—	0.0585	0.845
		Landfill (kg)	—	0.0011	0

*See page 35.



Use and Maintenance	Recycling and Disposal
3460	13.6
2350	—
0	0
0	0
2340	0
Copier paper 12200 Toner 85.0 Photosensitive materials 4.07 Developer 10.0 Maintenance materials 27.9 Others 27.4	0
1390	0
73.6	0
288/43.2	1.10/0
420/11.0	1.22/0
576/47.5	1.77/0
1370	0
73.6	0
2340	0
5.18 or less	0
3.13 or less	0
0.101	0
13.8	176.5
2.88 37.9	8.51

◎Environmental Impact Information

The idea of “no improvement without measurement” prompted Ricoh Atsugi to introduce a power monitoring system as well as a waste measuring system. The power monitoring system helps divisions conserve energy by allowing them to check how much electricity each division is consuming in real time. Under the waste measuring system, checks are made on the type and quantity of collected resources from each division that generates waste. This data is then compared against target values on a monthly basis, and immediate improvements can be made. The two systems are smoothly integrated into the Ricoh Group’s environmental impact information system* for the timely collection and analysis of environmental impact information. The systems are scheduled to cover the entire Ricoh Group in the future.

* See page 17.

Power monitoring system

Waste measuring system

Progress in Environmental Action Plans

The Ricoh Group establishes environmental action plans and takes various approaches to achieve its goals of promoting innovative environmental conservation activities and successfully carrying out environmental management on a global scale. The Ricoh Group first identifies the overall Eco Balance of corporate activities to determine the degree of environmental impact. Based on this analysis,

	Goals
Environmental Management System (See pages 15–16.)	●In order to continuously improve the EMS, it is essential for all Ricoh domestic and overseas business bases as well as production bases to acquire ISO 14001 certification by September 2000, and for the Ricoh Group as a whole to do so by the end of fiscal 2001.
Environmental Management Information System (See pages 17–18.)	●Construct an environmental impact information system for copiers, facsimiles, and laser printers by the end of fiscal 2000 (by the end of fiscal 2001 for other product lines). ●Construct a system to collect and provide information on environmental accounting, environmental improvement activities, regulations, environmental labels, and customers by the end of fiscal 2000.
Resource Conservation and Recycling (Products) (See pages 37–42.)	●Establish a collection and recycling system for products and supplies, especially toner cartridges, in Japan, Europe, the Americas, China and Taiwan, and the Asia-Pacific region by the end of fiscal 2001. ●Increase the resource recovery rate for copiers, facsimiles, and laser printers, including toner cartridges, to 90% or more by the end of fiscal 2001.
Resource Conservation and Recycling (Business Sites) (See pages 43–46.)	●Ricoh is to reduce final waste 90%, compared with that of fiscal 1992, by the end of fiscal 2001. ●Achieve a 100% resource recovery rate (zero waste) at all domestic production sites by the end of fiscal 2000. ●Achieve a 70% resource recovery rate at all domestic nonproduction sites by the end of fiscal 2000. ●Achieve a 100% resource recovery rate (zero waste) at all overseas production sites by the end of fiscal 2001.
Energy Conservation (Products) (See pages 47–48.)	●Reduce the energy consumption per product 30%, compared with that in fiscal 1996, by the end of fiscal 2001. ●Increase the speed of duplex copying and the number of types of recyclable paper that can be used in copiers to promote the efficient use of paper and thus reduce CO_2 emissions during paper manufacturing.
Energy Conservation (Business Sites) (See pages 49–50.)	●Ricoh is to reduce CO_2 emissions at least 15% by the end of fiscal 2001 on a per sales basis, compared with those of fiscal 1990. (Domestic and overseas production sites other than Ricoh's have set numeric goals of 15% or more each.)
Pollution Prevention (Products) (See pages 51–52.)	●Reduce the volume of specified chemical substances, such as lead and PVC, at least 50% on a per product basis in all products introduced in fiscal 2001, compared with products introduced in fiscal 1997. ●Reduce the level of noise emitted at least 2 dB and emissions of ozone and other by-products at least 20% for all copiers, facsimiles, and laser printers introduced in fiscal 2001, compared with products introduced in 1997.
Pollution Prevention (Business Sites) (See pages 53–54.)	●The Ricoh Group is to reduce the use of substances subject to PRTR at least 20% and emissions 50% or more, compared with those of fiscal 1997, and completely eliminate landfill waste by fiscal 2001. ● The Ricoh Group is to completely eliminate the use of trichloroethylene and tetrachloroethylene by fiscal 2001. ●Restrict the use of dichloromethane to the manufacturing of existing organic photosensitive materials by the end of 2001 and completely eliminate its use by the end of fiscal 2007.*

environmental action plans are drafted to effectively reduce the impact identified. The effects of the ensuing environmental conservation measures as well as the economic benefits gained are shown in the annual environmental accounting and publicized in the following year's environmental report.

Progress Made in Fiscal 1999

▶ Eleven of Ricoh's nonproduction bases are being merged under the environmental management system to acquire ISO 14001 certification by September 2000. A multisite system will be adopted for 446 sales bases (sales divisions, branches, and dealers), eight Ricoh Logistics business bases, and 286 Ricoh Techno Systems business bases. An environmental management system will also be established for overseas sales bases (Ricoh Corporation, Ricoh Europe B.V., Ricoh Hong Kong Ltd., and Ricoh Asia Pacific Pte. Ltd.).

▶ An environmental impact database and a waste measuring system are already in operation for the manufacturing processes at some business sites. A power monitoring system is currently being tested. A product information system on product use is in operation. An environmental impact database for maintenance was also started. Test operations for similar systems for design and procurement processes have started.

▶ The establishment of a cost accumulation system was completed in fiscal 1999 as part of the environmental accounting information system. The cost accumulation system was in operation at Ricoh from the second half of fiscal 1999.

▶ As of fiscal 1999, Ricoh's internal IT system includes databases on environmental laws and revisions, product recycling/energy conservation measures, external queries, World Wide Web inquiries, and the kinds of waste generated at business sites as well as information from environmental label forums, forums on the business environment surrounding sales, and the CO_2 Forum.

▶ **Product Collection and Resource Recovery System**

Nineteen collection centers and six recycling centers are in operation in Japan. A nationwide system is scheduled to be established by the end of fiscal 2000. Preparations for a similar system are underway in Europe, the Americas, China and Taiwan, and the Asia-Pacific region.

▶ **Toner Cartridge Collection System**

A toner cartridge collection system is in its final stage of completion in Japan, Europe, and the Americas. Preparations for a similar system are underway in China and Taiwan and the Asia-Pacific region.

▶ **Resource Recovery System for Toner Cartridges**

In Japan, Europe, and the Americas, toner cartridges are recovered and a resource recovery system is being constructed. Preparations for a similar system are underway in China and Taiwan and the Asia-Pacific region.

▶ The copier resource recovery rate in the second half of fiscal 1999 was 87% in Japan. Efforts to achieve similar results are being made overseas.

▶ In fiscal 1999, final waste was reduced 89.4%.

▶ As of March 2000, seven business sites (Ricoh Fukui, Ricoh Numazu, Ricoh Gotemba, Ricoh Hatano, Ricoh Atsugi, Ricoh Unitechno, and Part Component System's Sagamino Plant) achieved zero waste. All business sites are to achieve zero waste by the end of fiscal 2000.

▶ Achieved 59.6% in fiscal 1999.

▶ As of fiscal 1999, zero waste has not been achieved at any site. However, Ricoh Industrie France continues to achieve a 99% resource recovery rate.

▶ In fiscal 1999, energy consumption for black-and-white copiers was 92.5% that of fiscal 1996. (See notes to the Annual Power Consumption graph on page 47 for calculations.)

▶ In fiscal 1999, energy consumption for facsimiles was 59.6% that of fiscal 1996. (See notes to the Changes in Energy Consumption of Facsimiles graph on page 47 for calculations.)

▶ The duplex* copying/printing function of copiers and laser printers was improved through to advanced paper feed technology. Some series of copiers marketed in fiscal 1999 were able to sustain 100% duplex copying productivity while continuously printing.

*Duplex copying productivity (%) = (Time spent on simplex → duplex copying)/(Time spent for simplex → simplex copying) ×100

▶ Paper weighing 64g/m^2 can be used in all copiers, facsimiles, and printers marketed in fiscal 1999. Recycled paper containing 70% or more recovered paper can be used in all copiers, facsimiles, and printers marketed in fiscal 1999.

▶ Ricoh reduced CO_2 emissions 10.3% in fiscal 1999, compared with those of fiscal 1990. Six domestic production subsidiaries out of seven reduced CO_2 emissions 24.5–66.7%.

▶ Lead-free solder, polyolefinic harnesses, and hexavalent-chromium-free steel boards are to be used in all products marketed in and after fiscal 2001.

▶ As of fiscal 1999, the level of noise emitted during operation was reduced 1.7 dB and that while on standby was reduced 2.5 dB, compared to 1997 levels. Ozone emissions were reduced 20%, despite a slight increase in dust emissions, compared with those of fiscal 1997.
(Calculations are based on the weighted number of copiers sold and uses a productivity of 50 sheets per minute for all machines.)

▶ Substance use was reduced 13.2% and emissions 16.7% in fiscal 1999.

▶ The use of trichloroethylene was completely eliminated at all domestic and overseas business sites as was the use of tetrachloroethylene at all domestic business sites. Only one overseas business site currently uses tetrachloroethylene and is expected to completely eliminate its use in fiscal 2001.

▶ New addition in year 2000.

Environmental Management System

◎ Environmental Management System of the Ricoh Group

The environmental management system is an important tool in realizing environmental management. The Ricoh Group is a global entity that operates on an international scale. It respects the ISO 14001 environmental management system, which has received worldwide recognition, and is constructing an environmental management system that complies with this system. While disseminating the know-how of its major production bases around the world that have already obtained certification, the Ricoh Group is also planning to obtain ISO 14001 certification at all its business bases by the end of fiscal 2001.

The Ricoh Group is promoting the establishment of environmental management systems that correspond to the environmental aspects of each base. For example, at nonproduction bases we have taken measures to reduce indirect environmental impact as well as such direct environmental impact as zero waste and energy conservation at offices. Indirect environmental impact measures include designing and proposing the use of products with less environmental impact to customers.

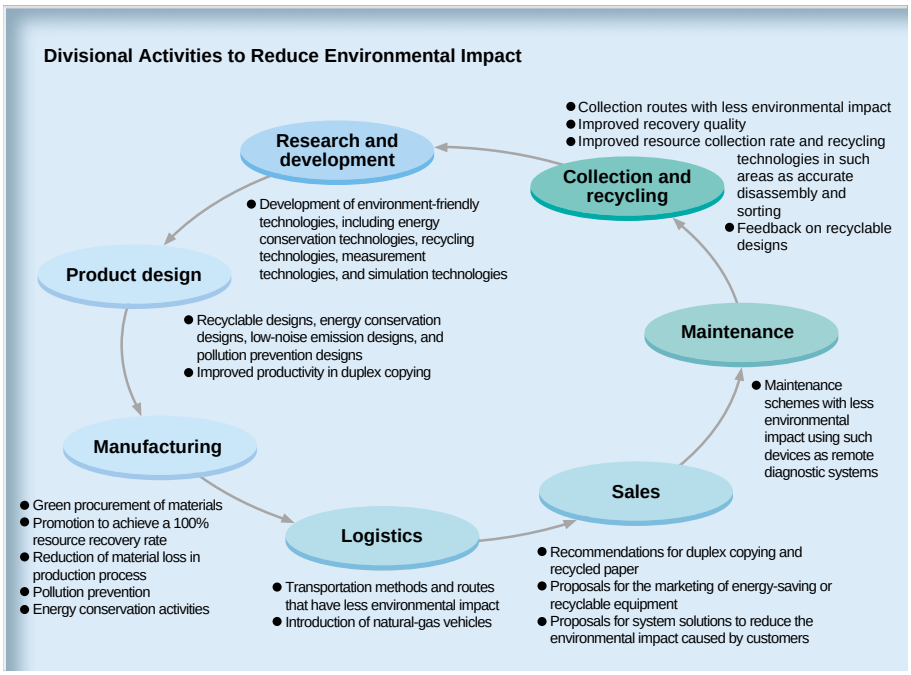
Goals and Progress

- In order to continuously improve the EMS, it is essential for all Ricoh domestic and overseas business bases as well as production bases to acquire ISO 14001 certification by September 2000, and for the Ricoh Group as a whole to do so by the end of fiscal 2001.
- ▶ Eleven of Ricoh's nonproduction bases are being merged under the environmental management system to acquire ISO 14001 certification by September 2000.

A multisite system will be adopted for 446 sales bases (sales divisions, branches, and dealers), eight Ricoh Logistics business bases, and 286 Ricoh Techno Systems business bases. An environmental management system will also be established for overseas sales bases (Ricoh Corporation, Ricoh Europe B.V., Ricoh Hong Kong Ltd., and Ricoh Asia Pacific Pte. Ltd.).

Registered Ricoh Group Environmental Management System Certification

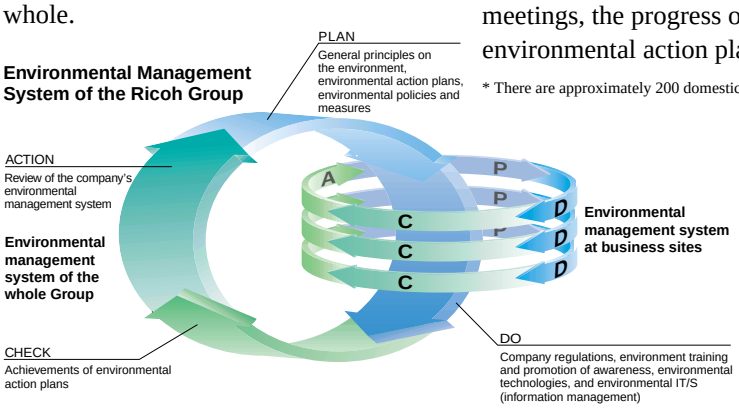
Name of Base or Business Site and Company		Location	Certifying Organization	Certification Applied for	Date of Certification
Ricoh Gotemba		Shizuoka Prefecture	JQA	ISO 14001	Dec. 25, 1995
Ricoh UK Products		England	BSI	ISO 14001	July 11, 1996
Ricoh Unitechno		Saitama Prefecture	LRQA	ISO 14001	Aug. 15, 1996
Okazaki Site, Ricoh Elemex		Aichi Prefecture	KHK	ISO 14001	Dec. 27, 1996
Tohoku Ricoh		Miyagi Prefecture	BVQI	ISO 14001	Feb. 14, 1997
Chemical Products Group (Ricoh Numazu and Ricoh Fukui), Ricoh		Shizuoka/ Fukui Prefecture	JQA	ISO 14001	March 12, 1997
Ena Site, Ricoh Elemex		Gifu Prefecture	JQA	ISO 14001	March 31, 1997
Ricoh Hatano		Kanagawa Prefecture	JQA	ISO 14001	April 21, 1997
Ricoh Atsugi		Kanagawa Prefecture	JQA	ISO 14001	April 21, 1997
Ricoh Industrie France		France	AFAQ	ISO 14001	May 6, 1997
Electronic Devices Division (Ricoh Yashiro and Ricoh Ikeda), Ricoh		Hyogo/ Osaka Prefecture	JQA	ISO 14001	June 4, 1997
Ricoh Asia Industry (Shenzhen)		China	CCEMS	ISO 14001	Jan. 20, 1998
Ricoh Electronics, Inc. (Office Machine Group)	・Equipment Production Division	U.S.A.	QMI	ISO 14001	Feb. 2, 1998
	・P.C.B. Production Division	U.S.A.	QMI	ISO 14001	Feb. 2, 1998
	・Machine Parts Division	U.S.A.	QMI	ISO 14001	Feb. 2, 1998
	・Fountain Valley Bldg.	U.S.A.	QMI	ISO 14001	Feb. 2, 1998
Ricoh Microelectronics		Tottori Prefecture	JQA	ISO 14001	Feb. 6, 1998
Ricoh Keiki		Saga Prefecture	JQA	ISO 14001	April 17, 1998
Sagamino Plant, Part Component System		Kanagawa Prefecture	JQA	ISO 14001	May 29, 1998
CHANG HWA FACTORY, Taiwan Ricoh		Taiwan	BCIQ	ISO 14001	June 22, 1998
Shanghai Ricoh Facsimile Co., Ltd.		China	Shanghai City Environmental Bureau CCIB	ISO 14001	July 20, 1998
NRG Distribution		The Netherlands	LRQA	ISO 14001	Oct. 2, 1998
Asan Plant, Sindo Ricoh Co., Ltd.		South Korea	LRQA	ISO 14001	Dec. 1, 1998
Ricoh Electronics (Supply Products Group, California)		U.S.A.	ABS	ISO 14001	Jan. 29, 1999
NRG Benelux B.V.		The Netherlands	KEMA	ISO 14001	Aug. 1, 1999
Hasama Ricoh		Miyagi Prefecture	BVQI	ISO 14001	Aug. 15, 1999
Ricoh Electronics (Supply Products Group, Georgia)		U.S.A.	ABS	ISO 14001	Sept. 24, 1999
Ricoh Optical Industries		Iwate Prefecture	JQA	ISO 14001	Dec. 17, 1999
Ricoh Electronics (Disk Media Group)		U.S.A.	QMI	ISO 14001	March 27, 2000
Ricoh Industrial de Mexico, S.A. de C.V.		Mexico	SGS	ISO 14001	March 30, 2000



system, the Ricoh Environmental and Chemical Safety Information System (RECSIS), defines methods for dealing with accidents involving chemical substances and is available to every business site. All accidents are reported to the world's leading officials, following decisions made at environmental conferences around the world, and appropriate countermeasures are taken, such as the prompt information disclosure to society. The Ricoh Group is taking preventive measures and is preparing countermeasures against accidents. Furthermore, even if another company has an accident, the Ricoh Group will review its own systems in areas corresponding to the one in which the accident took place.

Establishment of an Environmental Management System

The environmental management system continuously improves the environment in the Plan-Do-Check-Act (PDCA) cycle. The Ricoh Group uses the PDCA cycle to efficiently reduce environmental impact caused by not only individual business sites but by the Group as a whole.



Environmental Auditing

Environmental auditing is essential in improving Groupwide environmental conservation activities. The Ricoh Group's internal environmental audits are done by internal auditors* at each business site, and the results are given to the top management of the sites audited. At general environment meetings, the progress of the Group's environmental action plans is reported.

* There are approximately 200 domestic internal auditors.

Risk Management (Pollution and Disaster Prevention)

The Ricoh Group has acquired ISO 14001 certification at its main production bases around the world and has established a risk management system based on this. Our Groupwide chemical substance management

Gas sensor unit at Ricoh Yashiro. This device is designed to detect gas leakage, with relevant data monitored constantly in a control room.

Safety control room at Ricoh Yashiro. This room monitors detection devices throughout a plant. In an emergency, appropriate instructions are immediately given from the control room, accompanied by an alarm and a warning on monitors.

Preparing for an emergency at Ricoh Yashiro. Yearly training is conducted on the proper emergency measures to take when kerosine leaks from tank trucks and other scenarios.

Environmental Management Information System

◎Environmental Management Information System

Information technology is indispensable in identifying the environmental impact of overall business activities, in reducing environmental impact effectively, and in conducting economically efficient environmental conservation activities. The Ricoh Group has established a variety of information systems, including an environmental impact information system and an environmental accounting information system, to be used for its innovative environmental activities.

Goals and Progress

- ● Construct an environmental impact information system for copiers, facsimiles, and laser printers by the end of fiscal 2000 (by the end of fiscal 2001 for other product lines).
- ▶ An environmental impact database and a waste measuring system are already in operation for the manufacturing processes at some business sites. A power monitoring system is currently being tested. A product information system on product use is in operation. An environmental impact database for maintenance was also started. Test operations for similar systems for design and procurement processes have started.
- ● Construct a system to collect and provide information on environmental accounting, environmental improvement activities, regulations, environmental labels, and customers by the end of fiscal 2000.
- ▶ The establishment of a cost accumulation system was completed in fiscal 1999 as part of the environmental accounting information system. The cost accumulation system was in operation at Ricoh from the second half of fiscal 1999.
- ▶ As of fiscal 1999, Ricoh's internal IT system includes databases on environmental laws and revisions, product recycling/energy conservation measures, external queries, World Wide Web inquiries, and the kinds of waste generated at business sites as well as information from environmental label forums, forums on the business environment surrounding sales, and the CO_2 Forum.

Environmental Impact Information System

Based on Eco Balance[1], the environmental impact information system identifies and analyzes environmental impact at all stages, from materials procurement, manufacturing, logistics, and use to maintenance, collection, and recycling. Using a product's design data and information from the Ricoh Group network as well as from its suppliers, the environmental impact of a product throughout its life cycle is identified. Moreover, identifying environmental impact per division or per product makes decision making in management and product development more prompt and effectively reduces the environmental impact of business activities and prod-ucts. This system gives us such progressive means of disclosing information as Type III Environmental Impact Disclosure[2].

Environmental Accounting System

This system is a part of Ricoh's regular accounting system and is designed to ensure the efficient use of management resources for environmental conservation activities. In the future, we shall endeavor to use Eco Balance to identify all corresponding effects and economic benefits of our investments in all Groupwide environmental conservation activities.

Screen shot of a program used in the Environmental Impact Information System

1. See page 11.
2. See page 35.

Environmental Technology Development

Products incorporating innovative energy conservation technologies are able to provide significant economic benefits to the Ricoh Group by attracting an increased number of customers and contribute to society thanks to their lower environmental impact. High-quality environmental technologies can be said to be key factors in realizing environmental management. The Ricoh Group develops environment-friendly products and innovative environmental conservation technologies to promote pollution prevention. Furthermore, the Ricoh Group studies LCA to grasp how much further environmental impact can be reduced.

Product Design Technologies

Developing "Copiers of the Future"

In November 1999, Ricoh won the International Energy Agency's (IEA's) Demand-Side Management (DSM) Award of Excellence in the Copier of the Future Division for its energy-conservation technology. The IEA is a sub-organization of the Organization for Economic Cooperation and Development and had just started this division. Ricoh was the first company to design a copier that achieved an electricity consumption of 10W or less while on standby in high-speed-copying mode (30–60 pages per minute) and a recovery time of 10 seconds or less from energy-conserving idling mode.

	Copier of the Future	International Energy Star Program (Complex machines)
Page/minute	30–60	21–44
Power consumption while on standby	10 W or less	174 W*
Time to recover from energy-conserving idling mode	10 seconds or less	30 seconds or less

* This value was calculated using 44 pages/minute. Standard value ≦3.85 × (page/minute) + 5 W.

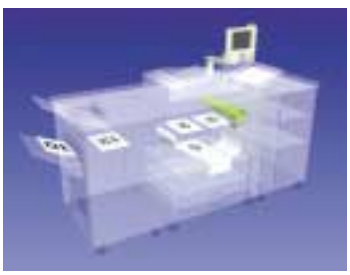
Copiers are often left idling for long periods of time. Therefore, reducing the amount of electricity consumed while idling mode significantly improves energy-conservation efficiency. Also, the less time a copier needs to recover from energy-conserving idling mode the more convenient it is.

Ricoh received "Copier of the Future" Award of IEA-DSM Program.

Duplex Copying and Paper Feeder Technology

Another IEA requirement for what are thought of as copiers of the future is a duplex copying function of at least 75% productivity*. Improvements in duplex copying speed will shorten copying time and reduce the amount of energy consumed. Because the energy consumption of copiers while in operation and while in idling mode is vastly different, higher processing speeds greatly help in energy conservation. Ricoh has developed a high-speed "switchback" system that speeds up processing and shortens the interval in which paper is fed into the copier. A paper-feeder simulator that eliminates nonfeasible feeding route designs has also been developed. The simulator utilizes data on various types of paper to check for possible problems in feeding thinner or lower-quality copier paper. It eliminates the need of making several prototypes at the design stage and, thus, resulting in less environmental impact. The imagio MF 8570 marketed in December 1999 incorporates the "nonstuck interleaf" duplex design to achieve nearly 100% duplex productivity while in continuous operation.

* Duplex productivity required by IEA: Duplex copying productivity (%) = (Time spent on simplex → duplex copying)/(Time spent for simplex → simplex copying) × 100. Time is measured from the moment the desired number of copies is entered and the "Copy" button is pressed to the moment the copier is ready for the next batch of copying. For example, if it takes the same amount of time to make 10 copiesof a 10-page document in simplex copying as it would to make 10 copies of a five-page document in duplex copying, duplex productivity would be 100%. (IEA specifies the method of measuring the performance of the ASTMF1318 in determining copiers of the future.)



Four-cycle duplex copying function with a "nonstuck interleaf" duplex design

Policy for Recyclable Designs

To improve the recyclability of products, Ricoh determined a policy for recyclable designs to improve the levels.

Recyclable Design Policy

Level 1 (1993)

- The use of insert molding prohibited
- The number of parts and screws to be removed when changing main components set
- The use of E-rings prohibited
- The adhesion of resin materials to different materials prohibited
- The amount of packaging reduced
- The use of heat crimping prohibited
- The use of toxic chemical substances prohibited

Level 2 (1994)

- Standards for outer packaging set
- Indicating material grades on labels made mandatory
- The use of resin that contains chlorine prohibited (dioxin prevention)
- The number of parts and screws to be removed when changing main components made stricter

Level 3 (1996)

- New provisions for recycling supplies added
- New provisions for harness layouts added
- New provisions for the restricted use of nitrous resin added
- The use of nylon clamps restricted
- Articles taking economic benefits into consideration revised

Level 4 (1999)

- Appropriate design items for process cartridges added
- New provisions for recyclable printed circuit board designs added
- The number of screw types reduced
- The use of nonhalogenous, fire-retardant resin introduced
- Overall set values for acceptable change in speed when machine is jarred revised

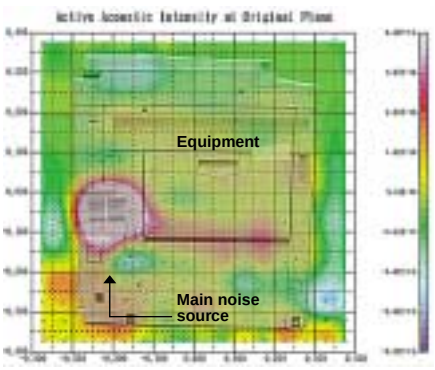
Pollution Prevention Technologies

Design Technology and Visible Air Current

Since setting standards on the noise level of our products in 1979, Ricoh has been raising those standards and improving the technology of noise reduction. The reduction in the noise level of fans had been a particularly important issue since fans are a major source of noise while in standby mode. But reducing fan speed will increase the temperature inside the equipment and also affect the performance of the filters used to limit ozone and dust emissions. Ricoh has therefore developed a technology to make invisible air visible inside the equipment to help reduce heat, noise, and ozone emissions. By using this technology, we can design products for optimum layout for ventilation and use ventilation more efficiently.

Noise Reduction Technology

The noise visualization system developed by the Ricoh Central Research Center measures and displays how much noise is emitted by which part of a product. Using this system, changes in design to reduce noise emissions can be made much faster.



Noise from the sides of a copier made visible

LCA Study

Qualitatively identifying the environmental impact made by products and parts throughout their life cycles is important in developing products with less environmental impact and in supporting their claims of superiority to customers. For this reason, Ricoh established the LCA Study Group in 1994 to deal with the practical applications of product LCA and to show a number of case studies. The study group discovered that when conducting LCA, collecting data becomes difficult—results may vary dramatically according to set conditions—and each step needs to be taken carefully. One LCA case took two years to complete. From the Group's experiences, we realized that LCA and Eco Balance[1] need to be used together in order for us to better identify environmental impact. Then, in 1998, we started the process of establishing an environmental impact information system[2] based on the idea of Eco Balance. Moreover, to help improve LCA through further studies, we cooperate with scholars and company leaders as well as participate in a number of organizations, including government committees.

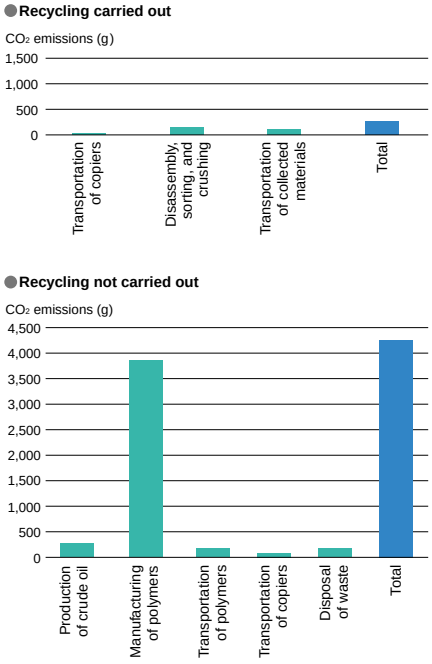
1. See page 11 for more information on LCA and Eco Balance.
2. See pages 17–18.

Product LCA of the spirio 5000 (new) and spirio 5000RM (remanufactured)

Ricoh, Tohoku Ricoh, and Fuji Research Institute Corporation worked together to conduct an LCA of RM copiers. To improve the reliability of the study results, we obtained an objective certification by Ecobilan Inc. in France.

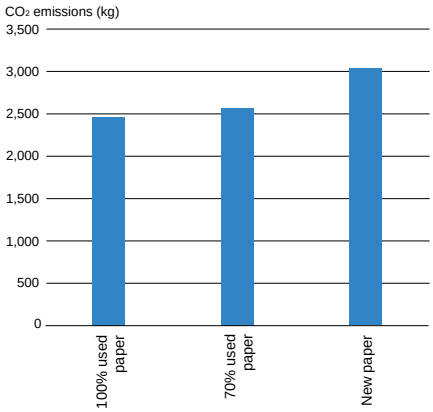
LCA of Resin Recycling for Copier Casing

Reported at the Eco Balance International Symposium in November 1998



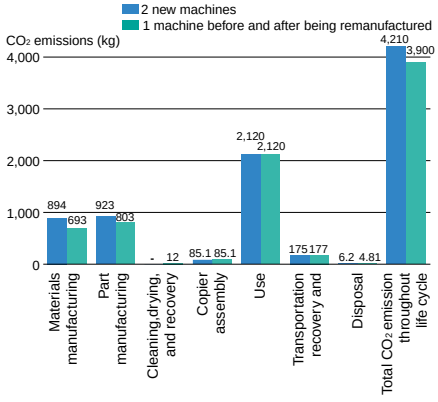
LCA of Copier Paper (CO_2 Emissions per Ton)

Presented at the Japan Hard Copy '97 Fall (November 1997) organized by the Society of Electrophotography of Japan

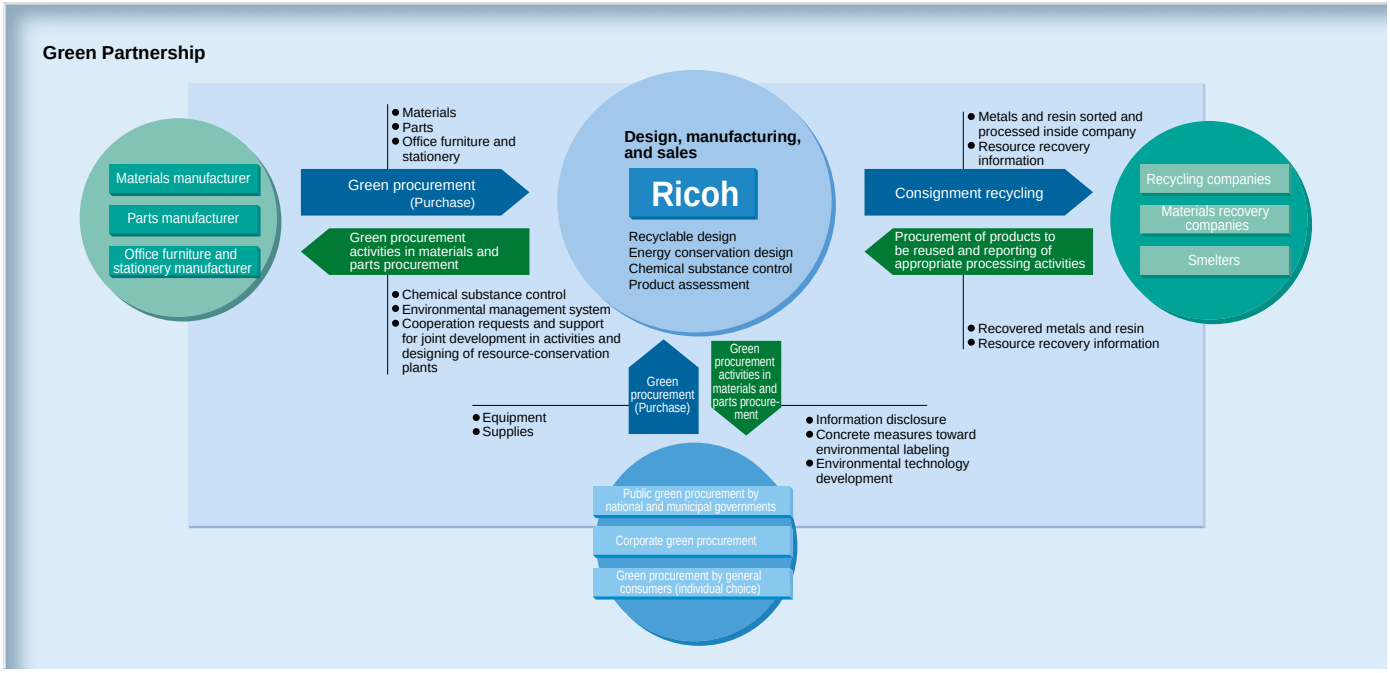


LCA of New and RM Machines

To compare the LCA of new machines to that of RM machines, the total CO_2 emission of two new machines and the total CO_2 emission of a single machine before and after being remanufactured are compared.



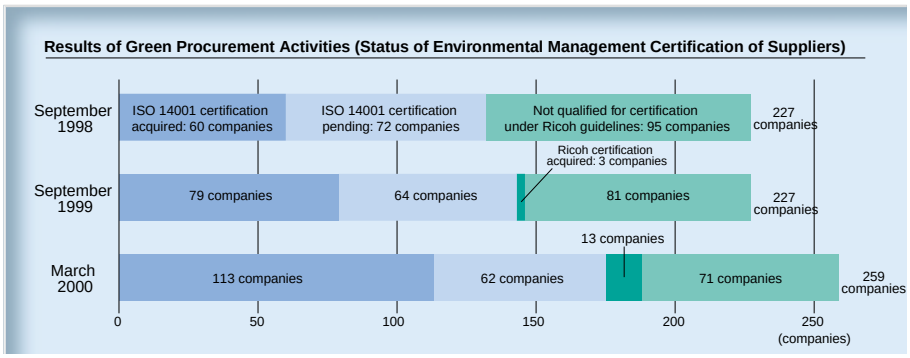
Green Partnership



◎Concept of Green Partnership

To reduce environmental impact in all corporate activities, it is important to purchase materials that have minimum environmental impact, use manufacturing techniques that minimize environmental impact, and sell products that have minimum environmental impact. The Ricoh Group views materials suppliers, customers, and contracted recycling companies as green partners and hopes to, with their help, minimize the environmental impact produced by business sites by carefully choosing the materials to be purchased and developing and marketing environmentally conscious products. In addition, we are aiming at effective environmental management by reducing the overall environmental impact and total costs.

The Ricoh Group *Green Procurement Guidelines*



Green Procurement of Materials

To ensure that both procured materials and the plants where they were manufactured have less environmental impact, the Ricoh Group issued its *Green Procurement Guidelines* in 1998. We asked suppliers to cooperate by either following the conditions laid out in the guidelines or by acquiring ISO 14001 certification. Rather than merely asking to observe its guidelines, Ricoh sends its internal auditors to suppliers to give advice and inspections free of charge. Because we work with a number of partner companies, it is important to disclose and share information and know-how so that our environmental activities will lead to higher economic benefits. Ricoh shares its technologies with suppliers through its *Green Procurement News* as well as through demonstrations at some of its successful zero waste plants*.

* See page 44.

Guidelines for Packaging Materials

The Ricoh Chemical Industry Division issued the *Green Procurement Guidebook*. This easy-to-understand guidebook contains many examples on packaging that uses fewer materials as well as packaging that is more environment-friendly, such as using recyclable drums instead of 18-liter containers, which are difficult to recycle.

Green Procurement of Office Consumables and Supplies

Ricoh Aoyama, Ricoh Omori, and Ricoh Ginza, which are all located in metropolitan areas, drafted a “green procurement list” for office automation (OA) equipment, office supplies, stationery, sales promotion giveaways, and gifts. The three business sites promote efficient green procurement activities with the use of the computerized ordering system they established. Ricoh is planning to adopt this system nationwide.

Ricoh Unitechno established a Green Supplies section, which is connected online to suppliers. Ricoh Unitechno’s inventory is automatically checked and restocked when needed, thereby eliminating the need to fill out order forms and wasting paper.

Green Supplies section at Ricoh Unitechno

Green Marketing

The Ricoh Group markets products worldwide that have less environmental impact and are certified with such Type I Environment Labels* as the Eco Mark, Blue Angel Mark (BAM), and Nordic Swan Mark. In order to incorporate Type I Environment Label standards into general design activities, we added Type I labeling requirements to our internal design standards and began activities that would ensure that all our copiers would pass these requirements.

* Labels certifying that the environmental conservation requirements established by a third party for marketed products have been satisfied. See pages 35–36 for approaches the Ricoh Group takes.

Environmental Impact Disclosure of Products

Disclosing environmental impact information to customers so that they will be able to choose products with less environmental impact is also important. The Ricoh Group was the first in disclosing product LCA information in Type III Environmental Impact Disclosure*. The product information we disclose to the government for its procurement list and to green procurement network is highly detailed.

* See page 35.

Supporting Partner Companies

The Ricoh Group believes in the importance of supporting its partner companies in reducing environmental impact and not just imposing conditions for green procurement. Through the Group’s activities, suppliers learn that “environmental improvement means cost reduction”, and as a result, we succeeded in improving management systems, reducing costs, and improving management people and employees’ awareness of environmental conservation.

More than ¥15 Million in Cost Reduction and Less Overtime (Shizukoh Industry)

Shizukoh Industry Co., Ltd. in Numazu City, has 70 employees and manufactures such plastic parts as toner bottles. It achieved zero waste in June 1999 by doing more than just complying with guidelines.

Shizukoh Industry President Mitsuhiro Aiyoshi said, “I knew Ricoh was enthusiastic about environmental conservation. Our enviromental concious products had to match Ricoh’s in quality. All our employees worked together to come up with ideas for quality improvement and environmental conservation measures. Shizukoh Industry is located in the same area as Ricoh Numazu, which is convenient for us if we need to ask them anything. Ricoh provided us with legal advice and directed plastic recycling companies our way, and we successfully established our system in a single year. Such environmental conservation activities as not dumping waste outside the plant helped us to become more socially responsible. Additionally, we were able to define what our ideal plant was.”

In the past, Shizukoh Industry used an estimation-based production system, in which it kept its assembly lines in continuous operation and stored the finished products. Currently, however, Shizukoh Industry uses a planned production system that does not require too many finished products to be held, realizing a cost reduction of more than ¥15 million from the previous year. Without having employees work much overtime, it was successful in establishing a comfortable work environment and getting more ideas for system improvement.

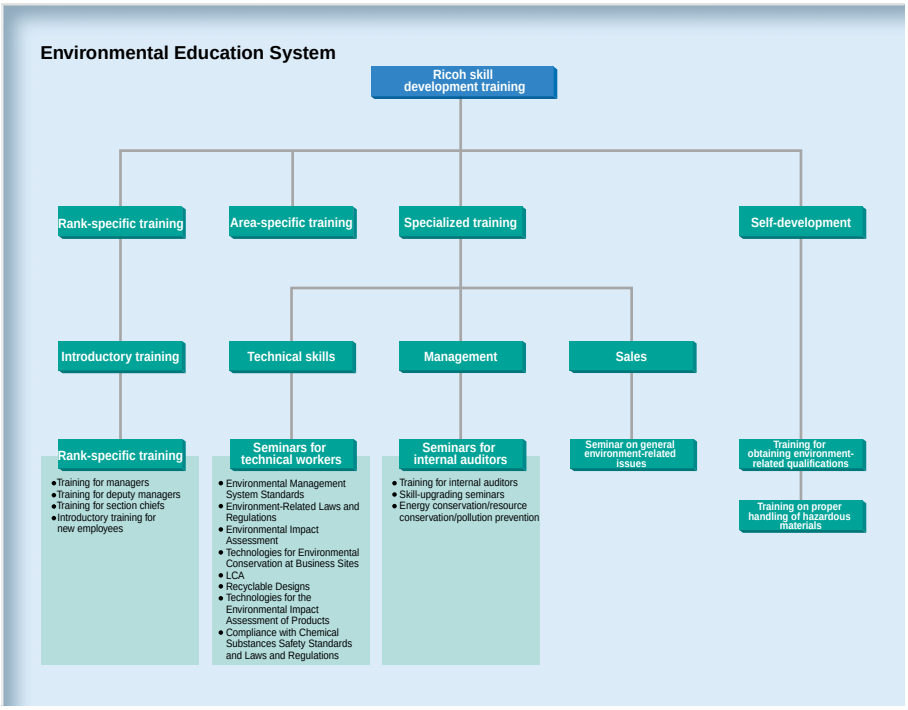
ISO 14001 Acquired Thanks to the Participation of all Employees (Suzuko Co., Ltd.)

Suzuko Co., Ltd., in Kawasaki City, has approximately 80 employees and manufactures stamped parts. Taking advantage of Ricoh’s green procurement approach, Suzuko has now acquired ISO 14001 certification.

Suzuko President Bunichi Watanabe, recalling his company’s history, said, “Our mechanics are generally older than those in other companies, and they seem to have a little difficulty getting used to environmental management systems like ISO 14001. I thought this would be a good opportunity to raise everyone’s awareness to the same level. Even I, at first, could not relate environmental conservation activities with cost reduction. Everything became clear after we assigned monetary value to energy conservation effects. When we began posting our achievements on the company bulletin board in terms of how much money was saved the month before, all our employees became aware of the relationship between environmental improvement and cost reduction.” As a stamped parts manufacturer, the company is quite adept at developing devices that prevent pollution and are resistant to vibrations, such as oil catchers. The company acquired ISO 14001 certification in August 1999. Even the managers and section chiefs are now able to review the environmental impact evaluation to renew the company’s certification.

Environmental Education and Awareness Promotion

Management and environmental activities were once considered completely contradictory to each other. These days, however, we know that these two ideas are, in fact, complementary. The most important things in environmental management that each employee needs to be aware of are decisions made by top management, ongoing divisional activities, and activities aimed at awareness reform. Environmental conservation activities may appear to be a corporate responsibility, but each employee needs to be conscious of them. Such activities may drastically change, depending on how aware our employees are of their purpose. With this in mind, the Ricoh Group is developing a variety of activities to promote companywide environmental education and awareness.



Support for Environmental Education and Activities

The Ricoh Group established an education system to help employees better understand the Group's environmental activities and become more environmentally aware professionals. Under this system, we hold a variety of seminars and trainings, including those for new employees, designers, and internal auditors who work under our environmental management system. Furthermore, we encourage employees to obtain official qualifications for administrators of pollution prevention activities and for work environment inspectors by establishing an internal system that awards employees who achieve any level of performance in environmental conservation.

Environment-Related Seminars and Number of Participants

Name of Seminar	FY 1998	FY 1999
Recyclable Designs	18	21
Technologies for the Environmental Impact Assessment of Products	22	22
Environment-Related Laws and Regulations	52	81
Environmental Management System Standards	69	8
LCA	20	46
Compliance with Chemical Substances Safety Standards and Laws and Regulations (Beginner's)	19	29
Compliance with Chemical Substances Safety Standards and Laws and Regulations (Advanced)	18	26
Total	218	233

Nurturing Environmental Volunteer Leaders

Employees can increase their own awareness of environmental conservation through practical experience more than they could through learning just theories. Ricoh makes the most of environmental volunteer activities as a means of not only contributing to society but also of promoting employee awareness. This is why Programs to Nurture Environmental Volunteer Leaders* were created: to provide employees with the opportunity to volunteer in environmental conservation activities.

*See page 28.

Company Environment Competition

The Ricoh Group has held a Company Environment Competition every year since 1995. Starting from the sixth competition, which was held in 2000, the scope was expanded to cover the entire Group. Over the years, the content of the competition has changed. In the past, specialists were given the opportunity to present case reports, but now the opportunity is given to top

management executives to present their policies on environmental management. At the sixth competition, in addition to having presidents of dealers in attendance, a few overseas affiliates presented case reports. It is evident that environment management has become rather important to the Ricoh Group as a whole.

The 6th Company Environment Competition

Information Disclosure Using In-house Newsletters and Environmental Information Journals

Ricoh's in-house newsletter has a page called "Hot Topics about Environmental Activities." It covers news about the Group's environmental activities and social standing, citing such achievements as awards and commendations won. The page was created with the aim of disseminating Group policies on taking positive corporate approaches toward environmental conservation activities, not only conveying information to employees. The Ricoh Group also publishes an environmental information journal called *ECO TODAY*, in which it introduces each division's environmental conservation measures as well as presenting interviews with people from environmental nongovernmental organizations (NGOs). Thus, we promote employees awareness from a broad perspective.

Ricoh Group's environmental information journal *ECO TODAY*

Concurrent Development of Know-how Using the Ricoh Group's Network

Ricoh Group companies worldwide can access and quote the latest environmental information from Ricoh's database. It is effective enough to allow company divisions to use the latest cases from the Group as benchmarks, to quickly spread recently gained know-how, and to further improve such know-how with additional information from different points of view.

Commending Environmental Activities

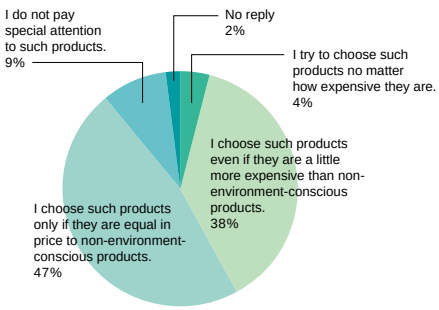
To promote employee-initiated environmental conservation activities, we introduced the Ricoh Group Environmental Proposal Award in 1998. As a result, we received a total of 320 proposals (268 from domestic business sites and 52 from overseas business sites) in three categories: (1) environmental technologies and environment-oriented products, (2) environmental businesses, and (3) environmental conservation activities that should be dealt with at the office or at home and other social activities.

Ricoh also presents employees with the Minori Prize for their work performance. In fiscal 1999, awards given in the environmental section were for the development of a small ISDN G4 telecommunications unit with an energy conservation mode, an industry-university joint program for putting up an environmental Web site for children, and to a project group for establishing the recycling center.

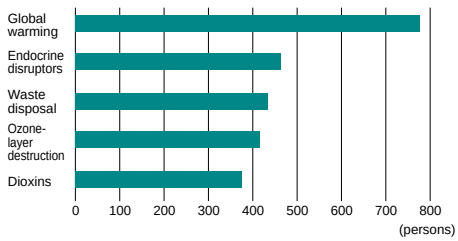
Awareness Survey

Ricoh promotes employee education and awareness on environmental conservation by providing such activities as the Company Environment Competition and by nurturing environmental volunteer leaders. In the meantime, for the purpose of assessing the current situation, we conduct employee awareness promotion surveys, and in fiscal 1999 we collected data from 1,266 employees. We will continue conducting this kind of survey to improve employee awareness in 2000.

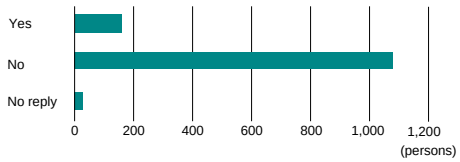
People's Awareness of Environment-Conscious Products in their Personal Consumption*



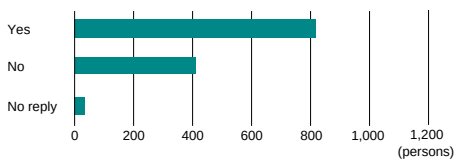
Top Five Environmental Issues that People Are Interested In*



Participation in Environmental Volunteer Activities*



Are You Interested in Environmental Volunteer Activities?*



Data from the 1999 surveys "Participation in Environmental Volunteer Activities" and "Are You Interested in Environmental Volunteer Activities?" reveal that there are fewer opportunities for employees to participate in such activities as volunteer projects on their own. Accordingly, Ricoh started offering programs to nurture environmental volunteer leaders in the same year.

*As of June 1999

Health and Safety

◎ Concept of Health and Safety

Ricoh was founded under a spirit of love: "Love your neighbor, Love your country, Love your work." For more than 60 years, our corporate culture reflected this spirit of affection in caring for all one's neighbors, for one's home country, and for the assignments that one undertakes. Through our management policies and action guidelines, we set out to achieve a personnel-oriented management, aligning company growth with individual well-being. Ricoh's health and safety activities, based on its founding spirit, management policies, and action guidelines, encourage everyone to continue in their efforts to secure the safety of each employee in a healthy and comfortable work environment.

[Basic Policy]

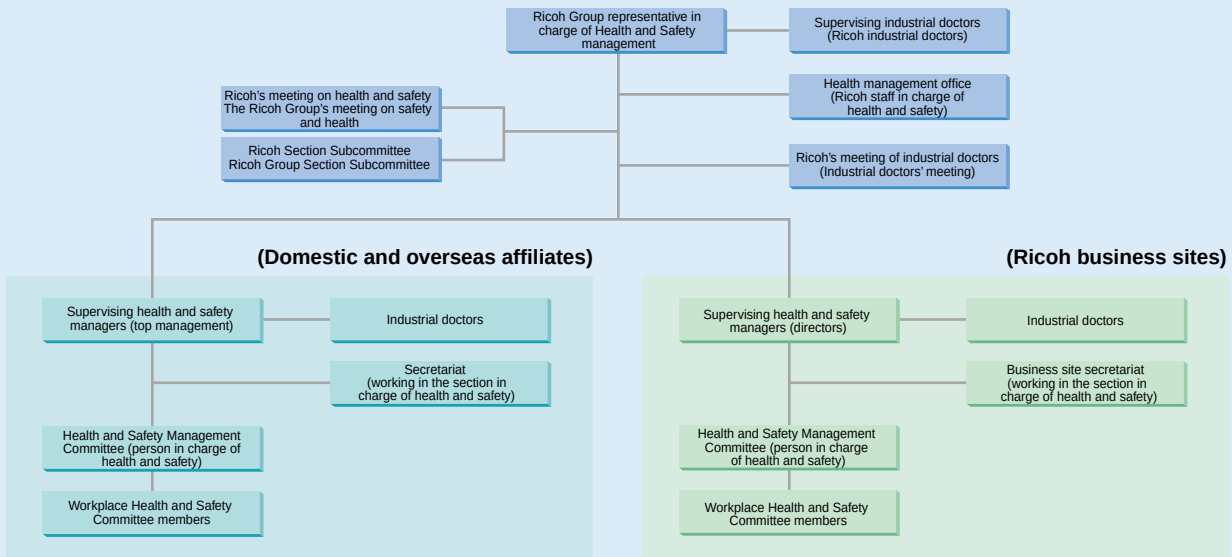
By putting our management policies into practice, we are more aware of the need to secure employee health and safety, and we earnestly strive to achieve this as well as to establish a comfortable work environment companywide.

[Action Guidelines]

- Not only do we comply with all domestic and overseas health and safety regulations, but we also set our own goals for employee health and safety and endeavor to achieve those goals.
- We shall continue to maintain and improve an independent health and safety promotion system to secure employee health and safety and to establish a comfortable work environment.
- By providing education in health and safety, we strive to raise the awareness of all our employees and support and encourage them to be interested in and to observe health and safety practices in all activities in society.
- In every country and region where we conduct business, we maintain close ties with local communities and contribute to their society by publicly disclosing our activities and assisting in health and safety activities.

Note: The policy and guidelines given here are under development and may be subject to change.

The Ricoh Group Health and Safety Management Organization Chart (Tentative)



Characteristics of Activities

The most important characteristic of Ricoh's health and safety activities is the balance the company emphasizes between health and safety. In a manufacturing industry, health and safety activities are apt to be tilted towards production sites. Ricoh, however, attaches the same weight to nonproduction sites as it does to production sites. We hold health seminars and provide counseling as well as promote mental and physical health.

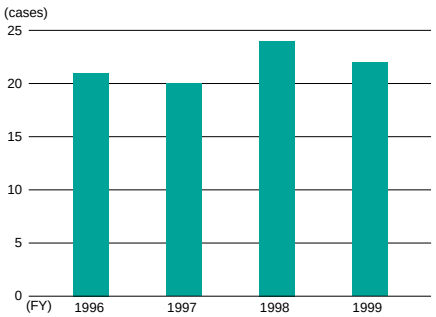
Ricoh takes advantage of the digital network technology it has become so good at in its business to establish a database and network for the purpose of disseminating health and safety information. The database and network allows us to quickly spread such information within the company, respond to business sites, and further improve our know-how.

Health and Safety Information Database

Safety Management Activities

Ricoh is developing on-site safety management activities that are based on employee intiatives. Specific activities include specifying workplaces to be added to a doctor's periodic rounds, examining disaster and accident prevention measures, thoroughly examining measures to prevent the reoccurrence of disasters and accidents, concurrently developing such measures at each business site, providing introductory safety training for new employees, and promoting employee awareness of safety. These activities contribute to reducing occupational hazards.

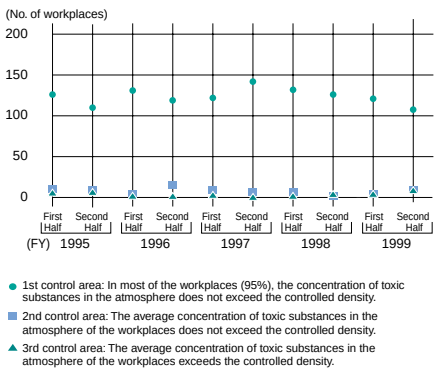
Changes in the Number of Occupational Hazards at Ricoh



Work Environment Measurement

The Ricoh Group continues to measure its work environment to prevent work-related health problems. We endeavor to improve the work environment by measuring not only those substances that are required to be measured by law but also those substances that are not required to be measured by law. This is conducted while keeping the impact all substances have on health in mind.

Work Environment Measurement (Ricoh and its domestic affiliates)

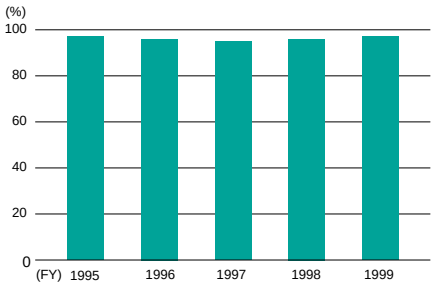


but also those substances that are not required to be measured by law. This is conducted while keeping the impact all substances have on health in mind.

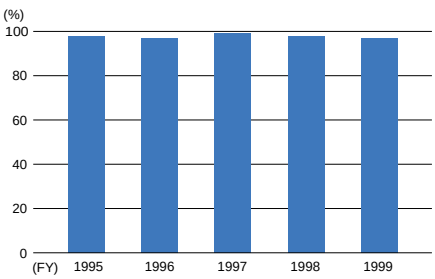
Health Checkups and Complete Medical Examinations

Ricoh offers health checkups and summary medical examinations to employees under the age of 40 (summary medical examinations to employees between the ages of 35 and 40) for the prevention and early diagnosis of diseases. As a health management measure for aging employees and for a more detailed health management scheme, Ricoh requires a complete medical examination for employees 40 years old or over and for those in managerial positions. Furthermore, for employees whose checkups or examinations revealed health problems, we established a follow-up system that includes reexaminations, detailed examinations, continued observation, and medication treatment. Our efforts for the prevention, early diagnosis, and treatment of diseases are thus ongoing. Our health management system also covers the family members of employees, with complete medical examinations offered to employees' spouses.

Health Checkup Rate



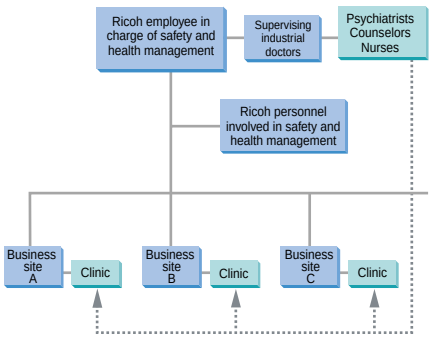
Complete Medical Examination Rate



Industrial Mental Health Care

Due to changes in the various environments surrounding companies, such as the economic environment, employees bear a heavier mental burden than before. Accordingly, it has become more important, even from a managerial point of view, to establish an industrial mental health care system. By entering into agreements with counseling centers and offering leave of absence, we endeavor to reduce minor psychiatric problems in employees and to support the early recovery of those suffering from mental stress. We have also established systems that allow employees to 1) check the level of stress they are under, using our internal network, and 2) send e-mail directly to counselors if they wish to do so.

Industrial Mental Health Care System



Ricoh Health Care Seminars

To help prevent and relieve lifestyle diseases, Ricoh Health Care Seminars are held regularly, inviting specialists in relevant areas of health. We held the Osteoporosis Seminar for Women in January and February 2000. Company nurses and female employees participated in these seminars. The seminars included a variety of lifestyle surveys, bone density measurements, counseling and individual guidance by doctors, and nutrition evaluation and lectures by nurses. During the seminar, the company cafeteria added calcium-enriched dishes to the menu.

Osteoporosis Seminar for Women

Date: January–February 2000
Personnel invited: All female employees of Ricoh Aoyama Head Office
Number of participants: 103 out of 125 invited personnel (participation rate: 82%)

Activities Promoting Health and Safety Awareness

Ricoh uses in-house brochures and a health management newsletter distributed throughout the Group's internal network to improve each employee's awareness of health and safety. With different themes addressed quarterly, the health management newsletter carries such information as basic physiology and tips for disease prevention.

Health management newsletter distributed by the Group's internal network

Wellness Club, published by the Ricoh San-Ai Group Health Insurance Union

Model Office for Health Promotion

The Ricoh Aoyama Head Office, in Tokyo, was designated by the Ministry of Labor as a "model office for health promotion in fiscal 1999." In June 2000, the Aoyama Head Office submitted reports on its health promotion system, health checkups and advice, and nurturing of employees. We were faced with creating higher-quality health and safety activities to achieve the goals set in the reports above.

Current Issues and Future Developments

Currently, certain areas of Ricoh's health and safety activities, such as its focus on activities at nonproduction sites and the establishment of a database and network to store and distribute health and safety information, can be found only in Japan; a global standard has not been achieved yet. With the introduction and development of the Work Health and Safety Management System, Ricoh is promoting more well-organized activities that include the participation of affiliates, aiming at ever-higher-levels of quality in its health and safety activities.

Social Contribution toward Environmental Conservation

The Ricoh Group believes that in addition to voluntarily implementing environmental conservation activities both within and outside the company, it is important for employees to act as global citizens. Ricoh has a variety of programs in place to improve employee awareness of and leadership abilities in environmental conservation activities. Ricoh aims at being a company that offers the opportunity to contribute to society in terms of environmental conservation. Such activities bring us closer to communities, and through this we shall spread the awareness of environmental conservation and the responsibilities of global citizenship to as many people around the world as possible.

Nurturing Environmental Volunteer Leaders

In 1999, Ricoh launched a leadership-training program to promote employee environmental volunteer activities. The program consists of training sessions (Ricoh nature seminars) and company meetings designed to produce 50 leaders annually. Following the training, each leader takes the initiative in developing environmental volunteer activities in close cooperation with relevant divisions or with the community. Ricoh provides support in promoting these activities.

● Ricoh Nature Seminars

The Ricoh nature seminar program aims at nurturing environmental volunteer leaders, allowing them to take the initiative in practical activities that help employees at all business sites to understand the meaning of social contribution for environmental conservation. Each seminar lasts for two days and is attended by approximately 15 participants. In fiscal 1999, we held three sessions. We invited the Wild Bird Society of Japan, an NGO, to lecture at our seminars, and from them we learned how to preserve *satoyama* (community forests) and participate in the conservation of nature through bird watching. We also had the chance to experience cutting down thickets and bamboo grass cropping.

● Ricoh Company Meetings for Environmental Volunteer Leaders

The 1st Ricoh Company Meeting for Environmental Volunteer Leaders was held in December 1999. The aim of the meeting was to update environmental volunteer leaders on each other's activities. Thirty-four volunteer leaders who registered for Ricoh nature seminars participated in the meeting to report on their activities in progress and to answer questions. The leaders also signed up for the Caring for Mr. Seki's Forest activity in Matsudo City, Chiba Prefecture, which was introduced at the meeting.

Ricoh Company Meeting for Environmental Volunteer Leaders

Participants in the Caring for Mr. Seki's Forest activity in Chiba Prefecture

A nature walk at a Ricoh Company Meeting for Environmental Volunteer Leaders

A Ricoh nature seminar

● Activities of Environmental Vounteer Leaders

Environmental volunteer leaders participate in activities that bring them closer to communities. Employees at Ricoh business sites to which participating leaders belong and their families, environmental nonprofit organizations (NPOs) and NGOs, citizen organizations, and others concerned with education take part in these activities.

Participants building sand sculptures and cleaning up Zaimokuza Beach in Kamakura City

Cleanup activity around Mt. Mitake in Okutama

Neighborhood elementary school children invited to learn about environmental conservation

Signboards at a wildlife preserve on the outskirts of Yokohama City

Social Contribution towards Forest Preservation

Ricoh started its social contribution program in fiscal 1999 to restore and preserve forests as well as to conserve biodiversity, which is being threatened worldwide. We are mainly engaged in preserving virgin forests and restoring natural forests, including *satoyama*.

At present, various companies and national governments are engaged in afforestation activities around the world and planting eucalyptus or palm trees to restore forests. Although such activities can be regarded as being beneficial to an extent due to the roles forests play in preventing certain natural disasters and in reducing the greenhouse effect by absorbing carbon dioxide, there are some doubts as to whether they actually help the ecosystem. Afforestation to prevent the deterioration of the global environment should be done using different native trees to restore the ecosystem.

Needless to say, forest conservation activities are almost impossible to carry out without the understanding and cooperation of local communities. Therefore, it is important to help these communities become more environmentally aware and to earn their cooperation. In poorer regions, it is also necessary to offer employment to the people living in the local community in the areas of forest restoration, afforestation, forest management, and resource recirculation.

With this in mind, Ricoh started six projects under its social contribution program in fiscal 1999 to restore and preserve forests. These projects always take the local ecosystem and people into careful consideration, working together with environmental NPOs in those regions as well as in Japan. Moreover, our employees have taken a leadership-training program, which was created to promote employee environmental volunteer activities.

Examples of Forest Conservation Assistance Programs

Country	NPO	Description
Sri Lanka	Field Ornithology Group of Sri Lanka	Conservation and restoration of forests in world heritage areas
Philippines	Conservation International	Conservation and restoration of forests in hot spot areas
Brunei	Ramsar Center Japan	Preservation of virgin mangrove forests
Madagascar	Pro Natura	Survey of tree crowns in forests
Bangladesh	Bangladesh Poush	Restoration of *satoyama*
Japan	Wild Bird Society of Japan	Preservation and restoration of *satoyama*

Children in Bangladesh learn about the environment using materials sent by Ricoh

Meeting to discuss a forest restoration project in Sri Lanka

The scheduled site for a forest restoration project in Sri Lanka

Land being cultivated for a *satoyama* restortion project in Japan

Land being plowed for the transplantation of rice seedlings for a *satoyama* restoration project in Japan

Rice seedlings being transplanted in a *satoyama* restoration project in Japan

Partnerships with NGOs and NPOs

Ricoh focuses on partnerships with NGOs and NPOs for the extensive learning, mutual understanding, and interactive benefits of joint promotion activities. Ricoh participated as one of the leader companies in the Global Warming Prevention Business Workshop organized by the World Wide Fund for Nature (WWF) Japan. Workshops were held at Ricoh Aoyama Head Office in December 1998 and September 1999. Approximately 30 companies, organizations, universities, members of the media, and the WWF Japan participated in these workshops, where representatives of different industries and NPOs cooperated with one another in improving the global environment.

The Global Warming Prevention Business Workshop at Ricoh Aoyama Head Office

"Free Will" Social Contribution Club

For the purpose of promoting social contribution activities by employees, Ricoh established a social contribution club in 1999 called Free Will. Employees donate a fraction of their salaries for social contribution activities. Ricoh supports those activities under a gift-matching system, in which the company matches the amount donated by employees for a given cause. To support environmental conservation activities, we made contributions to the Sahel Association, an NPO engaged in afforestation activities in the Sahara. The contributions were used to purchase saplings.

Promoting Children's Awareness of Environmental Issues

Ricoh created *ECO TODAY**, a Web site for elementary and junior high school students. We also prepared a CD-ROM to be distributed free of charge to approximately 120 schools and children. Through a series of dialogues between a boy and girl—Osamu and Hikaru—the CD-ROM presents well-known cases, global environmental issues, and things that can or should be done for the earth. Ricoh Corporation in U.S.A. created an environmental education Web site in the spring of 1999, which attracted 500 million visitors in its first year through such promotional activities as giving away a free car and by soliciting other companies for their support. Other environment-related Web sites in Japan average approximately 2 million to 3 million visits a year, so obviously this Web site is making a significant contribution to environmental education. For its performance, Ricoh Corporation was the only private company to be awarded the U.S. Environmental Protection Agency and U.S. Department of Energy's fiscal 2000 Energy Star award for Excellence in Consumer Education.

*See page 35.

ECO TODAY is distributed to approximately 120 schools and children

Web site and CD-ROM of the *Energy Star Program* of Ricoh Corporation

Disclosure of Environmental Conservation Activity Know-how

As of March 2000, the Ricoh Group achieved zero waste at seven business sites and actively disclosed how they achieved it. Ricoh Numazu exhibits its green procurement and recycling activities, invites the general public to stop by, and encourages personnel from the Shizuoka prefectural government and Numazu City government to visit and train at the plant, helping them in their goals of becoming environment-oriented governments.

Exhibition of recycling activities at Ricoh Numazu

The Shizuoka prefectural government's official training at Ricoh Numazu

Exhibition of recycling activities at Ricoh Fukui

Community-Oriented Activities Organized by Ricoh Sites

● **Ricoh Corporate Environment Office**
Cleanup of Katase Kaigan Beach, nature walk in Enoshima, cleanup of Enoshima Kaigan Beach, afforestation of Nirazaki, afforestation for cleaning up Teganuma Marsh, and *satoyama* conservation in Shin-Matsudo

● **Ricoh Fukui**
Creation of biotope; cultivation and release of killifish; cleanup participation after a heavy oil spill; cleanup of area around the plant; cleanup following the Anzen Kigan (pray for safety) Festival; support of the Sakaicho Social Welfare Council; support of welfare activities of the Home of Hasu, a social welfare corporation; and aluminum can recovery to purchase wheelchairs for donation

● **Ricoh Numazu**
Recovery of used aluminum cans collected by people from their homes and cleanup of area around the plant

● **Ricoh Gotemba**
Cooperration with an Acorn Society seminar and growing oak saplings

● **Ricoh Ikeda**
Environmental information exchange with Ikeda residents, afforestation and grass mowing for the Protect Our Satoyama Project, and cleanup of area around the plant

● **Ricoh Unitechno**
Participation in Saitama Prefecture's environmental conservation meetings, tree planting in city parks, and cleanup of area around the plant

● **Ricoh Elemex**
Joint environmental conservation activities with local elementary school students and opening of the Eco Plaza

Volunteers donating used aluminum cans from home (Ricoh Numazu)

Eco Plaza at Ricoh Elemex

Environmental Accounting

Corporate Environmental Accounting of the Ricoh Group for Fiscal 1999

Item	Costs		Economic benefits			Effect on
	Environmental costs	Main costs	Monetary effects	Category	Item	Environmental impact reduction (t)
Business area costs	¥1,670 million	Environment-related facility depreciation and maintenance costs	¥960 million	a	Energy savings and improved waste processing efficiency	CO_2 ……11,317
			¥5,090 million	b	Contribution to value-added production	
			¥700 million	c	Avoidance of risk in restoring polluted environment and avoidance of lawsuits	NO_x…… 2.006
Upstream/ downstream costs	¥2,410 million	Costs for collection and reassembly for recycling used products	¥580 million	a	Sales of recycled products, etc.	SO_x……7.404
Managerial activity costs	¥1,790 million	Costs for the division in charge of environmental measures; costs to establish and maintain the environmental management system	¥200 million	b	Improved efficiency in environmental education and establishment of the environmental management system	BOD……1.726
Research and development costs	¥1,660 million	Research and development costs for environmental impact reduction	¥50 million	a	Cost reduction through eco-packaging	Final waste disposal amount……3,458
			¥2,040 million	b	Contribution to value-added research and development	
Social activity costs	¥390 million	Costs for preparation of environmental reports and advertisements	¥70 million	b	Environmental advertisement, etc.	PRTR substances (178 substances, including toluene and dichloromethane)
Environmental restoration costs	¥130 million	Costs for restoration of soil pollution and environment-related reconciliation		–	None	
Other costs	¥50 million	Other costs for environmental conservation				
Total	¥8,100 million		¥9,690 million			

a=Substantial effect (actual gains from cost and energy reduction as well as sales of property, plant, and equipment) b=Expected effect (amount to which the environmental measures contributed)
c=Incidental effect (amount of additional costs avoided stemming from such problems as pollution and lawsuits)
1. Eco-efficiency (EE) value (unit: ton/¥100 million)=Environmental impact reduction amount/total amount of environmental costs
2. EE index=Total converted quantity of environmental impact reduction/total environmental costs (thousands of yen)
3. Eco-ratio (unit: ¥100 million/ton)=Total sales profit/total environmental impact amount
4. Eco-index=Total sales profit/total converted value of environmental impact reduction
5. Conversion coefficient is based upon literature related to LCA impact evaluations. For final waste disposal amounts and PRTR substances, the converted coefficient is set according to

◎Basic Concept for Environmental Accounting

To reduce environmental impact effectively, continuous efforts toward high-level environmental activities are indispensable. Moreover, to survive economically while upholding higher corporate values we must carry out environmental management in such a way that economic value is created through environmental activities. For this purpose, we need tools that are capable of evaluating the investment efficiency of environmental activities to aid in decision making. The Ricoh Group is in the process of creating an environmental accounting system that will be an important tool in realizing environmental management. However, because there are no general criteria set for environmental accounting like there are for managerial or financial accounting, this system is not yet ready to be used as a tool for managerial decision making nor for the comparison or evaluation of corporate values in society. Aiming at creating an environmental accounting system that can be used as a decision-making tool for environmental management, we had to set the original standards for environmental accounting. We identify the workings of our activities according to these standards and publish our achievements. Furthermore, we encourage cooperation with society in the areas of research and study in order to make environmental accounting common throughout the world.

◎Corporate Environmental Accounting

The Ricoh Group's environmental accounting system involves distinctively two different kinds of accounting: corporate environmental accounting and segment environmental accounting. Corporate environmental accounting aims at identifying all environmental impact reduction effects and economic benefits in each investment area. It is used as a decision-making tool in identifying and publicizing the Group's achievements as well as in making effective environmental investment. The inclusion of weighted eco-efficiency values and eco-ratios makes the Group's annual reporting on the effects and economic benefits of environmental impact reduction easier to understand.

Although we gave the environmental accounting results of only Ricoh in our 1999 environmental report, we have compiled the results of the entire Ricoh Group for the 2000 report. We have added a line item for PRTR substances to "environmental impact," and environmental impact made by water is now under biochemical oxygen demand (BOD).
* See pages 33 and 34.

●Calculation of Substantial Effects, Expected Effects, and Incidental Effects

For environmental accounting to be an effective tool for management, it is, first of all, important to understand the comprehensive cost efficiency of all environmental activities. The Ricoh Group calculates all the relevant environmental costs of direct environmental investments, from preventive investments

●Data collection points: Ricoh and 12 domestic and overseas production bases and manufacturing subsidiaries (See page 5.)
●Data collection period: from April 1, 1999, to March 31, 2000 (for costs and total environmental impact)
Environmental impact reduction shows the difference of the fiscal 1999 performance from the fiscal 1998 performance.

environmental conservation			Environmental impact	Eco-ratio[3] (¥100 million/t)	Converted value of reduction	Conversion coefficient[5]
Reduction rate	EE value[1]	Converted quantity of reduction	Total (t)			
4.1%	139.7	11,317	CO_2 ····· 262,053	0.0105	262,053	(1.0)
2.9%	0.0248	12.44	NO_x ····· 67.11	40.95	416.1	(6.2)
33.7%	0.0914	6.663	SO_x ····· 14.53	189.1	13.08	(0.9)
4.5%	0.0213	0.1726	BOD ····· 36.61	75.05	3.561	(0.1)
34.6%	42.69	359,632	Final waste disposal amount ····· 6,538	0.4203	679,952	(104.0)
		47,120	PRTR substances (178 substances, including toluene and dichloromethane) *See page 54.		250,683	(Ricoh standards per substance)
		418,088			1,193,121	
		0.0516			230.3	
		EE index[2]			Eco-index[4]	

Ricoh's internal standards.

through indirect investments, as well as all economic benefits, even setting premises for items in which economic benefits are difficult to identify. Furthermore, we categorize the economic benefits into substantial, expected, and incidental effects for better understanding. Thus, all stakeholders, no matter what value standards they have, are able to objectively judge the Ricoh Group's activities and corporate values.

●Introducing the Probability of Incidental Effects

The probability of incidental effects of risk-avoiding investments are not 100%. To obtain more realistic figures, we calculate incidental effects using an occurrence coefficient, taking the frequency of risk occurrence and the area influenced into consideration.

●Eco-Efficiency and Eco-Ratio

To identify the environmental impact reduction effects per item, such as CO_2 and waste, the Ricoh Group uses an eco-efficiency (EE) value, which is calculated by dividing the environmental impact reduction amount in a given year by the total amount of environmental costs for that same year. The value can clarify how much environmental impact is being reduced with a given amount of cost. However, the more that environmental issues are improved, the more value will be reduced, so it is difficult to measure environmental management efficiency using the EE value. Therefore, the Ricoh Group uses an eco-ratio, which is an index calculated by dividing total sales profit by the total environmental impact amount. The ratio can clarify how much added-value is produced for every ton of environmental impact substance emitted. A higher eco-ratio means that higher economically efficient activities can be realized with lower environmental impact.

●Annually Identifying Impact Effects and Economic Benefits of Environmental Activities Using the EE Index and Eco-Index

It is also important for effective environmental investment and project management to annually identify and compare environmental impact reduction effects and economic benefits for the entire environmental investment. The EE index and eco-index are calculated using weighted EE values and eco-ratios for each environmental impact item. We can judge how efficiently environmental impact was reduced by using the EE index and how efficiently profits were made in terms of less environmental impact by using the eco-index.

For the conversion coefficient for environmental impact items, social standards for CO_2, NO_x, SO_x, and BOD were adopted. However, for final waste disposal amounts and PRTR substances, for which no standards are set, the Ricoh Group set its own standards for conservation. For the purpose of continual examination and improvement, we gladly welcome any public opinion regarding conversion coefficient standards.

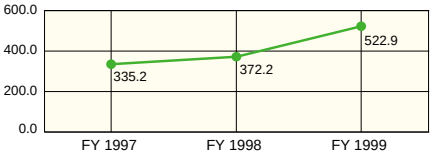
Conversion Coefficient for Environmental Impact Items

CO_2	1 (Standard)
NO_x	6.2
SO_x	0.9
BOD	0.1
Final waste disposal amount	104
PRTR substances*	Weighted value per substance according to Ricoh internal standards

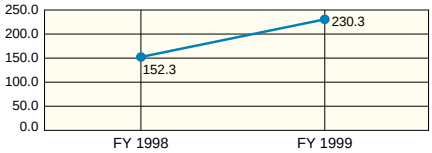
*See page 54.

Changes in Eco-Index

Ricoh



The Ricoh Group (including 12 domestic and overseas production bases and manufacturing subsidiaries)



Changes in Ricoh's Environmental Accounting

FY	Environmental costs	Economic benefits	EE index	Eco-index
1998	¥4,660 million	¥5,140 million	0.0236	372.2
1999	¥5,890 million	¥6,340 million	0.0196	522.9

Visit our Web site at http://www.ricoh.co.jp/ecology for details.

Environmental Accounting

Corporate Environmental Accounting of the Ricoh Group for Fiscal 1999

Item	Costs		Economic benefits			Effect on
	Environmental costs	Main costs	Monetary effects	Category	Item	Environmental impact reduction (t)
Business area costs	¥1,670 million	Environment-related facility depreciation and maintenance costs	¥960 million	a	Energy savings and improved waste processing efficiency	CO_2 ……11,317
			¥5,090 million	b	Contribution to value-added production	
			¥700 million	c	Avoidance of risk in restoring polluted environment and avoidance of lawsuits	NO_x…… 2.006
Upstream/ downstream costs	¥2,410 million	Costs for collection and reassembly for recycling used products	¥580 million	a	Sales of recycled products, etc.	SO_x……7.404
Managerial activity costs	¥1,790 million	Costs for the division in charge of environmental measures; costs to establish and maintain the environmental management system	¥200 million	b	Improved efficiency in environmental education and establishment of the environmental management system	BOD……1.726
Research and development costs	¥1,660 million	Research and development costs for environmental impact reduction	¥50 million	a	Cost reduction through eco-packaging	Final waste disposal amount……3,458
			¥2,040 million	b	Contribution to value-added research and development	
Social activity costs	¥390 million	Costs for preparation of environmental reports and advertisements	¥70 million	b	Environmental advertisement, etc.	PRTR substances (178 substances, including toluene and dichloromethane)
Environmental restoration costs	¥130 million	Costs for restoration of soil pollution and environment-related reconciliation		–	None	
Other costs	¥50 million	Other costs for environmental conservation				
Total	¥8,100 million		¥9,690 million			

a=Substantial effect (actual gains from cost and energy reduction as well as sales of property, plant, and equipment) b=Expected effect (amount to which the environmental measures contributed)
c=Incidental effect (amount of additional costs avoided stemming from such problems as pollution and lawsuits)
1. Eco-efficiency (EE) value (unit: ton/¥100 million)=Environmental impact reduction amount/total amount of environmental costs
2. EE index=Total converted quantity of environmental impact reduction/total environmental costs (thousands of yen)
3. Eco-ratio (unit: ¥100 million/ton)=Total sales profit/total environmental impact amount
4. Eco-index=Total sales profit/total converted value of environmental impact reduction
5. Conversion coefficient is based upon literature related to LCA impact evaluations. For final waste disposal amounts and PRTR substances, the converted coefficient is set according to

◎Basic Concept for Environmental Accounting

To reduce environmental impact effectively, continuous efforts toward high-level environmental activities are indispensable. Moreover, to survive economically while upholding higher corporate values we must carry out environmental management in such a way that economic value is created through environmental activities. For this purpose, we need tools that are capable of evaluating the investment efficiency of environmental activities to aid in decision making. The Ricoh Group is in the process of creating an environmental accounting system that will be an important tool in realizing environmental management. However, because there are no general criteria set for environmental accounting like there are for managerial or financial accounting, this system is not yet ready to be used as a tool for managerial decision making nor for the comparison or evaluation of corporate values in society. Aiming at creating an environmental accounting system that can be used as a decision-making tool for environmental management, we had to set the original standards for environmental accounting. We identify the workings of our activities according to these standards and publish our achievements. Furthermore, we encourage cooperation with society in the areas of research and study in order to make environmental accounting common throughout the world.

◎Corporate Environmental Accounting

The Ricoh Group's environmental accounting system involves distinctively two different kinds of accounting: corporate environmental accounting and segment environmental accounting. Corporate environmental accounting aims at identifying all environmental impact reduction effects and economic benefits in each investment area. It is used as a decision-making tool in identifying and publicizing the Group's achievements as well as in making effective environmental investment. The inclusion of weighted eco-efficiency values and eco-ratios makes the Group's annual reporting on the effects and economic benefits of environmental impact reduction easier to understand.

Although we gave the environmental accounting results of only Ricoh in our 1999 environmental report, we have compiled the results of the entire Ricoh Group for the 2000 report. We have added a line item for PRTR substances to "environmental impact," and environmental impact made by water is now under biochemical oxygen demand (BOD).
* See pages 33 and 34.

●Calculation of Substantial Effects, Expected Effects, and Incidental Effects

For environmental accounting to be an effective tool for management, it is, first of all, important to understand the comprehensive cost efficiency of all environmental activities. The Ricoh Group calculates all the relevant environmental costs of direct environmental investments, from preventive investments

●Data collection points: Ricoh and 12 domestic and overseas production bases and manufacturing subsidiaries (See page 5.)
●Data collection period: from April 1, 1999, to March 31, 2000 (for costs and total environmental impact)
Environmental impact reduction shows the difference of the fiscal 1999 performance from the fiscal 1998 performance.

environmental conservation			Environmental impact	Eco-ratio[3] (¥100 million/t)	Converted value of reduction	Conversion coefficient[5]
Reduction rate	EE value[1]	Converted quantity of reduction	Total (t)			
4.1%	139.7	11,317	CO_2 ····· 262,053	0.0105	262,053	(1.0)
2.9%	0.0248	12.44	NO_x ····· 67.11	40.95	416.1	(6.2)
33.7%	0.0914	6.663	SO_x ····· 14.53	189.1	13.08	(0.9)
4.5%	0.0213	0.1726	BOD ····· 36.61	75.05	3.561	(0.1)
34.6%	42.69	359,632	Final waste disposal amount ····· 6,538	0.4203	679,952	(104.0)
		47,120	PRTR substances (178 substances, including toluene and dichloromethane) *See page 54.		250,683	(Ricoh standards per substance)
		418,088			1,193,121	
		0.0516			230.3	
		EE index[2]			Eco-index[4]	

Ricoh's internal standards.

through indirect investments, as well as all economic benefits, even setting premises for items in which economic benefits are difficult to identify. Furthermore, we categorize the economic benefits into substantial, expected, and incidental effects for better understanding. Thus, all stakeholders, no matter what value standards they have, are able to objectively judge the Ricoh Group's activities and corporate values.

●Introducing the Probability of Incidental Effects

The probability of incidental effects of risk-avoiding investments are not 100%. To obtain more realistic figures, we calculate incidental effects using an occurrence coefficient, taking the frequency of risk occurrence and the area influenced into consideration.

●Eco-Efficiency and Eco-Ratio

To identify the environmental impact reduction effects per item, such as CO_2 and waste, the Ricoh Group uses an eco-efficiency (EE) value, which is calculated by dividing the environmental impact reduction amount in a given year by the total amount of environmental costs for that same year. The value can clarify how much environmental impact is being reduced with a given amount of cost. However, the more that environmental issues are improved, the more value will be reduced, so it is difficult to measure environmental management efficiency using the EE value. Therefore, the Ricoh Group uses an eco-ratio, which is an index calculated by dividing total sales profit by the total environmental impact amount. The ratio can clarify how much added-value is produced for every ton of environmental impact substance emitted. A higher eco-ratio means that higher economically efficient activities can be realized with lower environmental impact.

●Annually Identifying Impact Effects and Economic Benefits of Environmental Activities Using the EE Index and Eco-Index

It is also important for effective environmental investment and project management to annually identify and compare environmental impact reduction effects and economic benefits for the entire environmental investment. The EE index and eco-index are calculated using weighted EE values and eco-ratios for each environmental impact item. We can judge how efficiently environmental impact was reduced by using the EE index and how efficiently profits were made in terms of less environmental impact by using the eco-index.

For the conversion coefficient for environmental impact items, social standards for CO_2, NO_x, SO_x, and BOD were adopted. However, for final waste disposal amounts and PRTR substances, for which no standards are set, the Ricoh Group set its own standards for conservation. For the purpose of continual examination and improvement, we gladly welcome any public opinion regarding conversion coefficient standards.

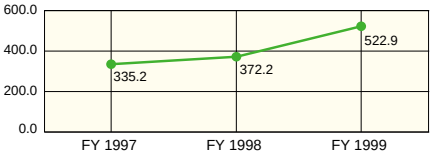
Conversion Coefficient for Environmental Impact Items

CO_2	1 (Standard)
NO_x	6.2
SO_x	0.9
BOD	0.1
Final waste disposal amount	104
PRTR substances*	Weighted value per substance according to Ricoh internal standards

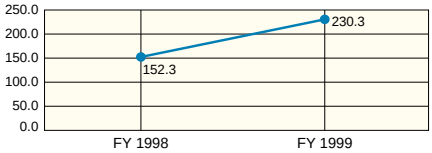
*See page 54.

Changes in Eco-Index

Ricoh



The Ricoh Group (including 12 domestic and overseas production bases and manufacturing subsidiaries)



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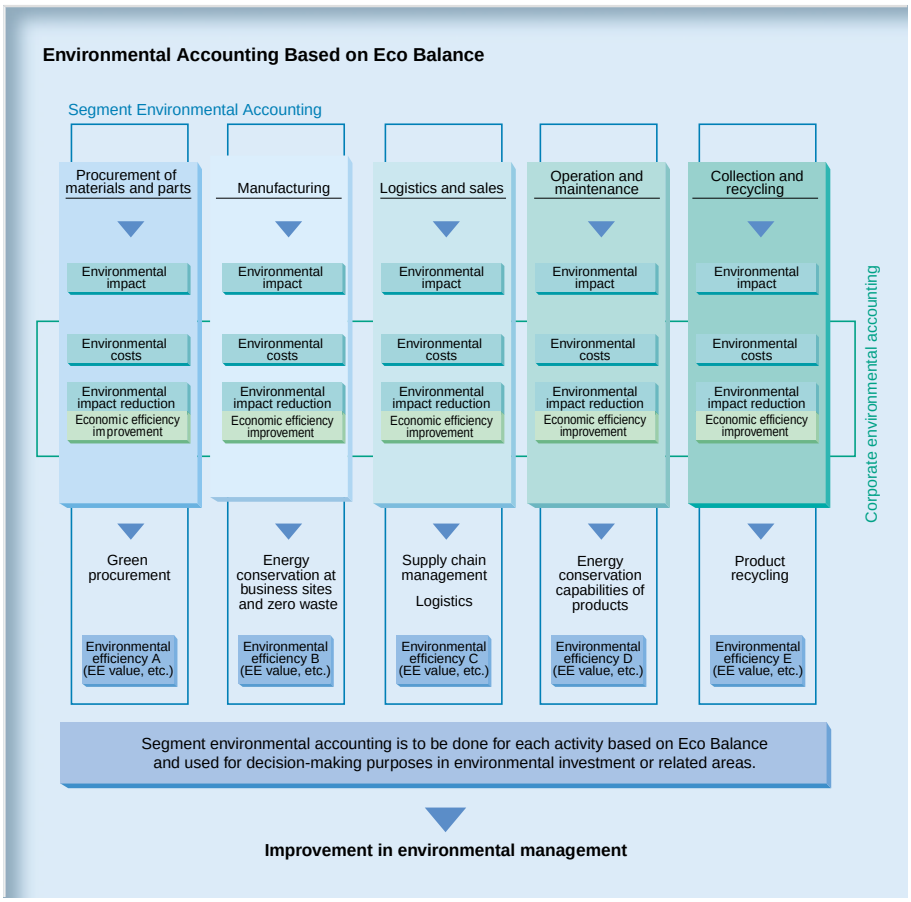
◎Segment Environmental Accounting

Segment environmental accounting is the Ricoh Group's unique internal environmental accounting system used to estimate the investment efficiency of environmental facility investments into business sites or new projects. Although it is important for all companies to engage in environmental conservation activities, it would be difficult for them to survive if they did so at the expense of economic efficiency. Therefore, estimating the environmental impact reduction effects and economic benefits of a proposed energy-conservation system and identifying the effectiveness of the system is of utmost importance. Despite arguments that the effectiveness of environmental accounting is only in assessing and measuring the effects of large-scale investments, segment environmental accounting is effective in evaluating small-scale investments, such as investments into divisional facilities. To facilitate decision making, the Ricoh Group shall conduct segment environmental accounting prior to any environment-related investment or project.

●Segment Environmental Accounting (1) Estimates for Effects of an Energy-Conservation System (Table 1)

Ricoh Numazu examined two types of cogeneration systems: one that used "A" heavy oil and one that used town gas. It was discovered that the "A" heavy oil system would reduce costs significantly but at an increased CO_2 emission level. The town gas system, on the other hand, would work at a significantly lower CO_2 emission level but would not reduce cost much. It would require five years to recover investments made in the latter system. Ricoh Numazu eventually decided to use the town gas cogeneration system, taking both environmental impact reduction effects and economic efficiency into consideration. According to a detailed examination of cost efficiency gains after the introduction of the co-



(Table 1) Segment Environmental Accounting (1) Estimates for Effects of an Energy-Conservation System

Cost			Effects		
Item	Main costs	Amount (millions of yen)	Economic benefits	Environmental conservation effects	EE value
Business costs	Facility investment	430	Reduced lighting and heating expenses ¥1,053 million*	Reduced CO_2 emissions 34,651 t*	6,618 t/¥100 million*
	Personnel, maintenance, etc.*	93.6*			

*Over the depreciable life of cogeneration system statutory depreciation years

(Table 2) Segment Environmental Accounting (2) Effects of a Wastewater Disposal System

Cost			Effects	
Item	Main costs	Amount (millions of yen)	Economic benefits	Environmental conservation effects
Business costs	Facility investment	464	Reduced wastewater disposal expenses ¥1,271 million*	Reduced quantity of wastewater disposed 41,092 t*
	Personnel, maintenance, etc.	170*		

*Accumulated from 1994

(Table 3) Segment Environmental Accounting (3) Effects of Green Partnership

Cost			Effects	
Item	Main costs	Amount (millions of yen)	Economic benefits	Environmental conservation effects
Upstream/ Downstream costs	Personnel	3,492[1]	Reduced expenses in establishing an economic management system ¥78 million[2]	Reduced CO_2 emissions 282 t[2] Final waste disposal amount reduced 133 t[2]

1. Net time required for Ricoh to carry out environmental auditing and give advice to suppliers is translated into personnel expenses
2. Total amount for 13 suppliers certified by Ricoh as adhering to Ricoh guidelines

generation system, cost will be reduced approximately ¥1.05 billion and CO_2 emissions will be lowered about 35 thousand tons over a statutory depreciation period.

●Segment Environmental Accounting (2) Effects of a Wastewater Disposal System (Table 2)

The Ricoh Yashiro Plant developed a closed system for industrial water usage. The introduction of a wastewater disposal system in 1993 helped Ricoh Yashiro reduce its environmental impact and wastewater disposal costs. According to cost effectiveness analysis, this disposal system produced approximately ¥1.27 billion in economic benefits as of fiscal 1999, and about ¥630 million in costs will be collected in 2.5 years.

●Segment Environmental Accounting (3) Effects of Green Partnership* (Table 3)

The Ricoh Group considers suppliers who sell materials and parts that have less environmental impact as green partners and continues to support them in constructing their own environmental management systems. Free environmental auditing and advice given by Ricoh to suppliers can be translated into approximately ¥3.492 million in personnel expenses. In other words, Ricoh and its suppliers saved more than ¥74 million by not having external consultants help them construct their environmental management systems. This result would then be followed by economic benefits gained from energy conservation and other measures. The implementation of environmental management effectively cut 282 tons of CO_2 and 133 tons of waste.

*See pages 21–22.

Environmental Facility Investment (FY 1999) (millions of yen)

	Total facility investment	Environmental facility investment
Ricoh	17,800	1,480
Ricoh Group	24,544	1,959

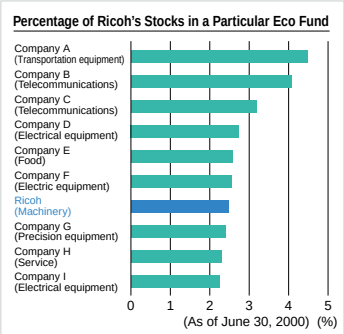
Penalties and Fines against Ineffective Environmental Conservation Activities (Ricoh Group)

	FY 1997	FY 1998	FY 1999
Number of cases	2	2	1
Amount (US$)	5,000	4,171	5,187

Environmental Accounting and Corporate Values

Eco Funds and Stock Price Fluctuations

Following the United States and European countries, “eco funds”, which are to be used for investments into highly environment-oriented companies, were made available in Japan. The eco fund market has expanded to more than ¥200 billion in the six months since it began. Ricoh’s stocks are incorporated in a number of such eco funds, some of which even require “environmental accounting be introduced” before Ricoh stocks can be incorporated. Environmental accounting is thought to improve corporate values. However, eco funds are currently being criticized as being “merely high-technology information stocks”, and they, in fact, sometimes focus on financial screening rather than on environmental screening. We have found that Ricoh’s stock prices fluctuate in response to media reports on the company’s performance. Even if the company was favorably evaluated in environmental management surveys and corporate surveys on social contribution, there were no noticeable trends in the market. Environmental activities or social contributions have not yet become major factors in increasing corporate values in Japan.

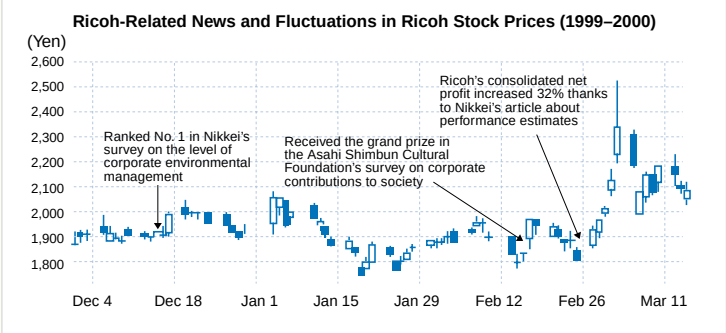


Marketing and Sales

How are the people who are engaged in the daily buying and selling of commodities responding to all this? There are increasingly more cases in which governmental authorities and big companies require products to be environment friendly before being eligible for bidding as well as cases in which companies are being asked to explain their environmental measures before proposing certain products or systems. A potential customer once came to us and said he would like to know about our environmental activities and environmental accounting. After our explanation, he purchased our products. We enjoy anticipating future market trends.

Aiming at Establishing Environmental Accounting

At present, financial statements and annual reports are the principal tools in measuring corporate value. In the future, environmental accounting and environmental reports will likely play major roles in evaluating companies. However, nothing specific has been set in environmental accounting. Ricoh’s environmental accounting is still under development as well. We are working towards establishing our own set of standards and conducting our own environmental accounting based on these standards. We would like to improve the accuracy of the tools that are used in environmental management using our revised standards and to earn society’s trust through the voluntary disclosure of our environmental accounting information.



Environmental Communication

It is important for environmental communication to gain the support of stakeholders. It is also important to support the environmental activities of others. The Ricoh Group notifies its stakeholders of its environmental management progress by writing it up in its environmental reports and on its Web site as well as by releasing environmental impact information on its products through Type III Environmental Impact Disclosure. Using advertisements, lectures, and exhibitions, we give examples of our successes in environmental impact reduction and introduce some of the environmental activities we are engaged in that are economically beneficial. Thus, we contribute to improving social awareness and reducing environmental impact.

Relationship between Stakeholders and Information Disclosure Measures

Items to Be Disclosed		Environmental Reports	Web Site	Environmental Labels	Environmental Advertisements
Global environmental conservation	Contents and results	●	●		●
	Know-how	●	●		●
Neighbors		●	●		
Customers		●	●	●	●
Green procurement		●	●	●	●
Investors and shareholders		●	●		●
Employees	Policies, health and safety information	●	●		
	In-house promotional activities on awareness	●	●		

Environmental Reports

The Ricoh Group's environmental report has been issued annually since its first publication in April 1998, which disclosed fiscal 1996 data. An English version of the Japanese-language report has been published since the fiscal 1998 edition, which was released in January 1999, to disclose information to our diverse stakeholders. The fiscal 1999 edition won the top Green Reporting Award in recognition of its achievements in clarifying the information disclosure system and specifying the system's relevance in the environmental management system, Eco Balance, and environmental accounting. Our affiliates and business sites issue their own environmental reports.

Environmental Web Site

Ricoh's environmental Web site includes information on a variety of topics, such as the Ricoh Group's environmental report and activity updates as well as links to ECO TODAY*, a Web site aimed at elementary and junior high school students. ECO TODAY was created jointly by Ricoh and students from vocational schools. ECO TODAY presents familiar examples of global environmental issues and introduces countermeasures adopted by Ricoh. We strive to promote interactive communications at our Web site by answering questions via e-mail.

*See page 30.

Ricoh's environmental Web site

ECO TODAY

Disclosing the Environmental Impact Information of Products through Type III Environmental Impact Disclosure*

The environmental impact information of products is indispensable for customers wishing to choose products that have less environmental impact. The Ricoh Group, for the first time in Japan, disclosed information on the environmental impact its imagio MF 6550 digital copier has throughout its life cycle, based on third-party certification (BVQI, Sweden). We are also planning to disclose information on our facsimiles and printers through Type III Environmental Impact Disclosure by the end of fiscal 2000 and on the rest of our machines by the end of fiscal 2001.

*See page 11.

Definition of Environment Labels

● Type I Environment Labels

Type I labels (e.g., the Eco Mark) are attached to products satisfying environmental conservation standards set by a third party. (See labels below.)

● Type II Environment Labels

Type II labels (e.g., the Ricoh Recycle Mark) are attached to products satisfying standards set independently by manufacturers. (See page 41.)

● Type III Environmental Impact Disclosure

Type III disclosure contains quantitative environmental impact information so that customers can better compare products.

International Type I Environment Labels and Ricoh Group Efforts

● Eco Mark/Japan

The Eco Mark is a labeling system the Japan Environment Association has been using since 1989, with applications being extended to copiers in 2000. As of July 2000, 34 types of copiers, including the imagio series, have been awarded this mark.

● Blue Angel Mark (BAM)/Germany

BAM certification standards are specified in detail by the German Federal Environment Agency throughout the production process, from manufacturing to the disposal of applicable products. Most Ricoh products sold in Germany are BAM certified.

● Nordic Swan Mark/Scandinavia

The Nordic Swan Mark is an eco-label system that has been used by five Scandinavian countries—Norway, Sweden, Finland, Iceland, and Denmark—since 1989. In 1997, seven Ricoh copier machines were awarded the label.

Environmental Advertisements

Ricoh's environmental advertisements are aimed at worldwide environmental impact reduction, following its policy of "no image advertising." Our advertisements explain the environment-friendly functions of our products to companies promoting green procurement or give examples that we think are useful to people promoting environmental conservation from various points of view. A particular newspaper advertisement that highlighted a product's environment-friendly functions was used as an example of a good environmental advertisement at the Nippon Association of Consumer Specialists' (NACS') booth at Eco-Products 1999. A magazine advertisement outlining Ricoh's environmental conservation activities received the Fiscal 1999 Nikkei Ecology Advertisement Award for "demonstrating what future environmental advertisement should be."

Newspaper advertisement explaining the environment-friendly functions of a product

Magazine advertisement outlining environmental activities

Lectures

The Ricoh Group has given a number of lectures and released several papers in the past. In fiscal 1999, Ricoh's top executives gave lectures on environmental management and environmental information at the United Nations University and at the Global Environment Businesspeople Summit. Furthermore, we actively joined corporate lectures, academic societies, and symposiums for the purpose of contributing to society.

President Sakurai gives a lecture at the United Nations University.

Mr. Kamimoto, Executive Director, gives a lecture at the Global Environment Businesspeople Summit.

Major Environmental Lectures and Papers Given in Fiscal 1999 (Ricoh)*

Item	Number
Environmental lectures	43
Papers and articles contributed to academic periodicals	13

* Summary of major projects in which the Ricoh Corporate Environment Office was involved
Activities have also been conducted by internal divisions.

Exhibitions

Ricoh actively takes part in environmental activities at exhibitions, such as Eco-Products 1999 and the environmental section at trade shows. Ricoh Ikeda promotes communication with communities by having an entry in its Ikeda City Environmental Fair to explain to residents how it approaches environmental conservation.

Eco-Products 1999

● International Energy Star Mark/ Japan, the United States, Europe, etc.

Only products with power consumption below a certain level while on stanby can be sold with the International Energy Star Mark. All of Ricoh's applicable products have been awarded these marks.

● RESY Mark/Germany

The RESY Mark certifies that the packaging used in shipping a product satisfies RESY technical standards. It also guarantees that the packaging materials used will be collected in Germany. Ricoh's packaging material design has met RESY standards since 1993.

● DSD (Green Point) Mark/Germany

The DSD mark certifies packaging materials collected by DSD-designated companies are for reuse and recycling. The packaging Ricoh uses for its cameras has been awarded this mark.

Resource Conservation and Recycling (Products)

◎Concept of Resource Conservation and Recycling

The Ricoh Group, under its Comet Circle concept, is developing environmental conservation activities, aiming at realizing a society that recirculates resources. In the Comet Circle, the smaller the loops get the less environmental impact there is*. The Ricoh Group develops higher-level recycling and reuse measures for environmental conservation, focusing on the inner loops of the Comet Circle for product recycling activities that have lower environmental impact and higher economic efficiency. Ricoh introduced a recyclable design system in 1993 and is aggressively working to establish it throughout Japan, starting with an overall recycling plan in fiscal 1998. In 1997, we introduced the spirio 5000RM, the first RM copier. With the goal of making the recycling business economically feasible by the end of fiscal 2004, we are engaged in expanding the reuse of products and promoting the use of recycled (RC) machines as well as improving the level of recyclable design.

*See page 7.

Goals and Progress

- Establish a collection and recycling system for products and supplies, especially toner cartridges, in Japan, Europe, the Americas, China and Taiwan, and the Asia-Pacific region by the end of fiscal 2001.

▶**Product Collection and Resource Recovery System**

Nineteen collection centers and six recycling centers are in operation in Japan. A nationwide system is scheduled to be established by the end of fiscal 2000. Preparations for a similar system are underway in Europe, the Americas, China and Taiwan, and the Asia-Pacific region.

▶**Toner Cartridge Collection System**

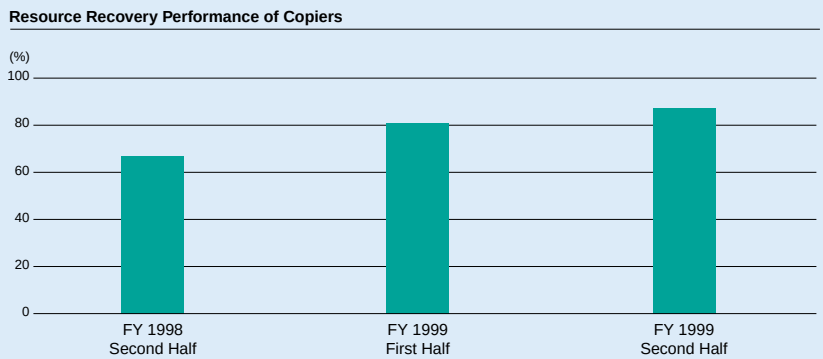
A toner cartridge collection system is in its final stage of completion in Japan, Europe, and the Americas. Preparations for a similar system are underway in China and Taiwan and the Asia-Pacific region.

▶**Resource Recovery System for Toner Cartridges**

In Japan, Europe, and the Americas, toner cartridges are recovered and a resource recovery system is being constructed. Preparations for a similar system are underway in China and Taiwan and the Asia-Pacific region.

- Increase the resource recovery rate for copiers, facsimiles, and laser printers, including toner cartridges, to 90% or more by the end of fiscal 2001.

▶The copier resource recovery rate in the second half of fiscal 1999 was 87% in Japan. Efforts to achieve similar results are being made overseas.



Overall Recycling Plan

Recycling begins at the product development and design stages, not at collection. Ricoh's product recycling is based on the idea that environmental impact reduction and economic values should be pursued equally. In 1990, we began looking into introducing an Overall Group Product Plan, in which parts can be used in different products, to promote the effective use of resources and the reduction of cost. Such interchangable parts can be recycled in new machines. In fiscal 1998, to improve the efficient recycling of products, this system was integrated into the Overall Recycling Plan, which designates in advance which parts are for reuse and recycling. In the future, we plan to design parts and products that will be able to be reused no matter which generation they are from.

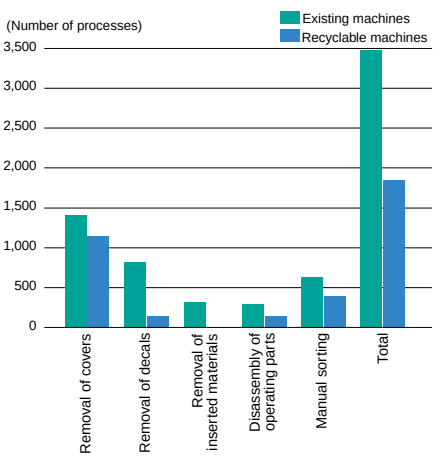
Recyclable Design

In 1993, Ricoh announced its policy on recyclable designs, and in 1994 it introduced the spirio 2700 series, the first line of copiers based on the recyclable design. The spirio 2700 series was designed to significantly reduce the time and cost it takes to disassemble a copier and sort the materials after collection (e.g., fewer screws used in the machine and more-consistent plastic materials). The Ricoh Group expanded its policy on recyclable designs and product assessment to cover its entire line of copiers, facsimiles, and laser printers in 1993. Furthermore, we improved the level of recyclable designs, which resulted in higher economic benefits.

Provisions for Recyclable Designs

1. Provision for the reuse of products, units, and parts
2. Provision for the recycling of materials
3. Provision for the recycling of chemicals
4. Provision for the recovery of energy
5. Provision for the reduction in size and weight of products
6. Provision for the reduced use and recycling of packaging materials

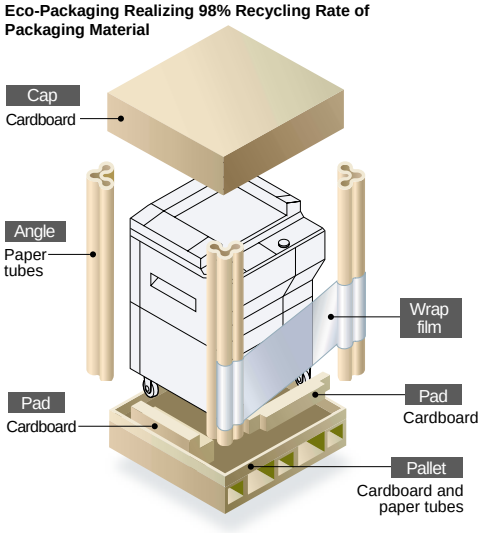
Comparison of the Disassembly and Sorting of Existing and Recyclable Machines



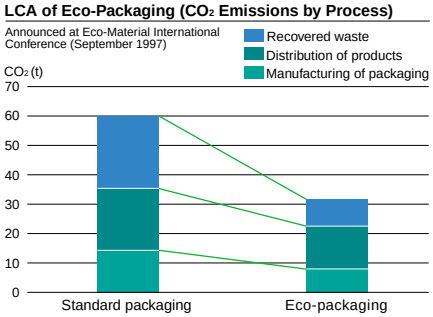
Eco-Packaging (Resource Conservation of Packaging Materials)

It is important to conserve resources used in not only products but packaging materials as well. In 1994, Ricoh developed eco-packaging, which consists mainly of laminated cardboard that can be easily disassembled and sorted and is 98% recyclable. In the past, packaging materials used for such products as copiers were made of composite materials, including wood, cardboard, and polystyrene foam, and were difficult to disassemble and sort. Therefore, most of the disposed materials were either burned or buried. By 1997, Ricoh had already packaged more than 180,000 copiers with eco-packaging and shortened transportation routes in Japan. This has helped cut CO_2 emissions produced in transportation and the burning of packaging by half. The amount reduced is equivalent to the amount of CO_2 generated by burning more than 9,000 200-liter barrels of heavy oil. Ricoh is investigating the usage of eco-packaging worldwide as well as other product packaging and transportation systems that have less environmental impact.

Eco-Packaging Realizing 98% Recycling Rate of Packaging Material



LCA of Eco-Packaging (CO_2 Emissions by Process)



Strength Tests of Products and Packaging Materials

Even though our goal is to simplify packaging, it is important to ensure that the products themselves are strong enough to withstand damage during shipping. Based on Ricoh's recyclable design policies, product strength tests are mandatory. Such tests are conducted at the Product Resistance Evaluation (P.R.E.) Laboratory, which is equipped with the latest test devices, such as a horizontal shock tester and a vibration tester. Ricoh's P.R.E. Laboratory was the first facility built by a Japanese manufacturer to have been officially recognized by the International Safe Transit Association (ISTA). Measurements obtained here are internationally recognized.

A package's strength is being tested against vibrations.

A package's strength is being tested against shock.

●Recovery Centers

Some of the used products and parts collected at collection centers are earmarked and sent to recovery centers to be recovered and reused. Business sites and Group affiliates that manufacture such products and parts act as recovery centers.

●Recycling Centers

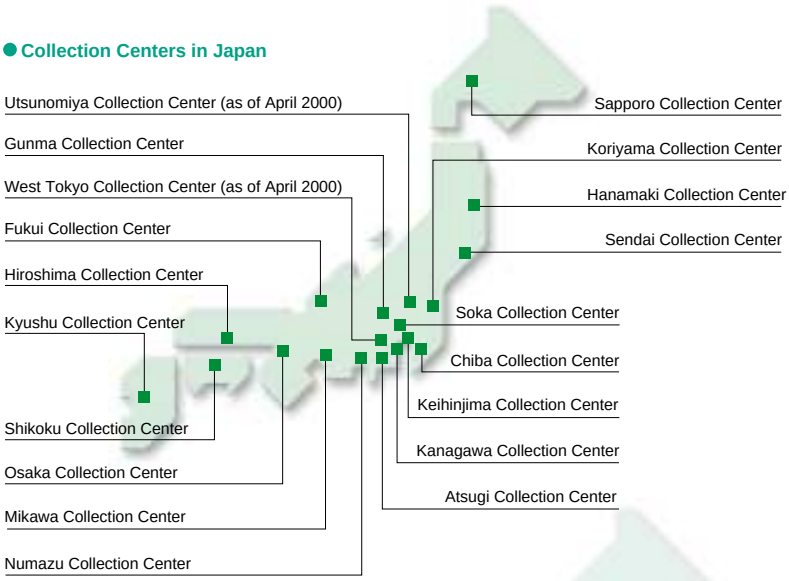
Recycling Centers disassemble used products collected at collection centers and sort out the parts that are to be reused. Next, the plastic parts are graded, crushed, and sent to subcontractors to be used in the manufacture of parts for Ricoh products. Recycling centers are in operation at six locations: Hokkaido, the northern and southern Kanto and Kansai areas, and Kyushu. Additional centers are scheduled to open in other parts of the country by the end of 2000.

●Recycling Information Sharing System

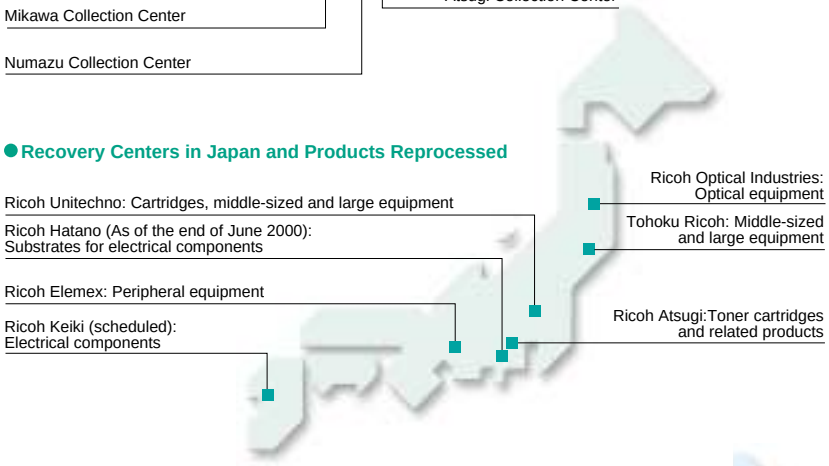
Ricoh is setting up a system in which the company can share information on used products with recovery and recycling centers. To retrieve information on a particular product, all a center has to do is enter the model code of the recovered product it is interested in. It is important for recovery and recycling centers to be familiar with their inventory because used products are, in fact, their resources or materials. This information sharing system uses bar codes to track all products and is designed to operate as a part of the environmental impact information system*.

*See pages 17-18.

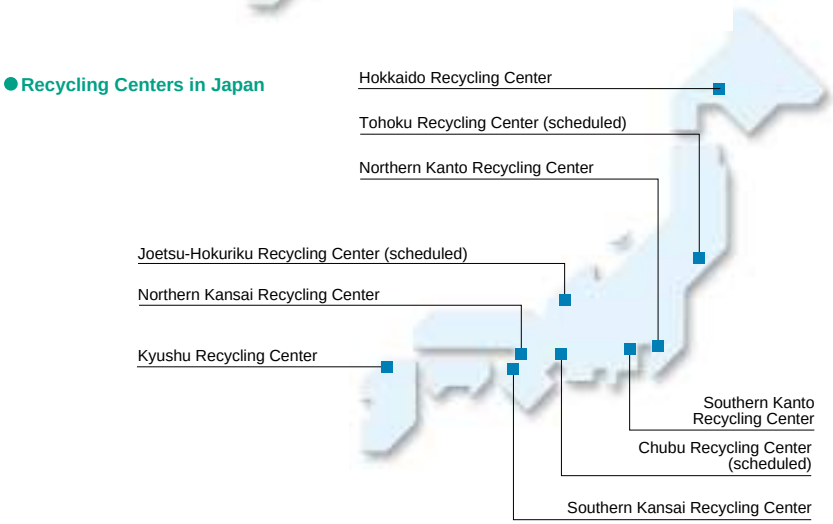
●Collection Centers in Japan



●Recovery Centers in Japan and Products Reprocessed



●Recycling Centers in Japan



Kyushu Recycling Center

RM Copiers

In October 1997, Ricoh marketed a copier called the spirio 5000RM. The spirio, like other RM copiers, incorporates recycled parts. More than 60% (mass ratio) of the RICOPY FT5500 series that was marketed in 1993 was reused as parts in the 5000RM. All 5000RM units are manufactured using recycled parts, including the inner cover, which is made from recycled plastic. Performance of the copier was enhanced by making the liquid crystal panel easier to see. Following the spirio 5000RM, Ricoh marketed other RM models, such as the spirio 7210 series and the spirio 8210 RM.

spirio 5000RM

The Ricoh Recycle Label

In order for its products to be quickly recognized as having less environmental impact, the Ricoh Group uses the Ricoh Recycle Label, which ensures compliancy with Group standards on recyclable designs, the reuse rate of parts, the collection system, resource recovery, and environmental safety. As of March 2000, five models, including the spirio 5000RM, spirio 7210RM series, spirio 8210RM, and spirio 105BB, have been sold with this label.

Criteria for the Ricoh Recycle Label (Summary)

1. The product satisfies Ricoh's recyclable design standards
2. Reused* parts account for 40% or more of the product's mass (mass ratio)
3. Toner cartridges used in the product are recyclable, and a system for recycling them has been established.
4. A system for collecting and processing used products as well as collecting used cartridges and containers has been established.
5. At least 90% of the product's mass (mass ratio) can be recovered and recycled in Ricoh's recycling system.
6. Consideration is given to environmental safety, as stipulated in Ricoh's standards.

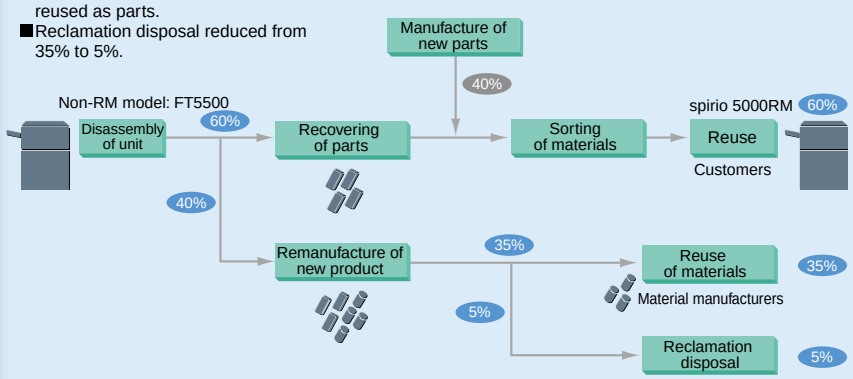
*Reuse means to use something for the same purpose in its original form.

Recycle

Recycled Parts Used in the spirio 5000RM

Results of using collected parts

- 60% of the RICOPY FT5500 series reused as parts.
- Reclamation disposal reduced from 35% to 5%.



Environmental Accounting for Ricoh's Recycling Business

The cost of recycling is an important issue for manufacturers because they are considered responsible for the collection of used products. By following its policy on recyclable designs in 1993, Ricoh has taken cost-efficient approaches early on by improving the collection routes of its products and by establishing a recycling system. As a result, we were able to successfully market RM copiers made from 60% or more (mass ratio) collected parts from used copiers. The cost-efficiency of Ricoh's recycling business is expected to be directly proportional to the increase in the number of collected units. Improvements at the recyclable design level will lead to an improved recycling efficiency of collected products.

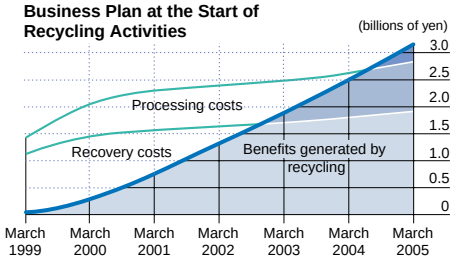
Environmental Accounting for the Recycling Business of the Ricoh Group (including dealers) in Fiscal 1999

(millions of yen)

Costs		Effects		
		Economic benefits		Environmental conservation effects
Recovery	877			
Processing	1,157			
Necessary expenses	455	Sales	408	Resource recovery rate (copiers) 87.3%
Total	2,489			

*The resource recovery rate as of the end of fiscal 1998 was 67.0%. The rate was significantly improved by the end of fiscal 1999.

Business Plan at the Start of Recycling Activities



Recycling Activities around the World

In March 2000, Ricoh Group representatives from five regions around the world gathered in Tokyo for the 1st Conference on Global Environment and Recycling. The conference was held to examine the recycling promotion activities of the Ricoh Group as a whole, share information on global issues, and horizontally develop groundbreaking activities. The Americas, Europe, and Japan had an early start in developing recovered machines that reuse parts collected from used products. In the Americas, fewer products are returned to Ricoh Group members for collection than in China and Taiwan or the Asia-Pacific region, which achieved relatively high rates of collection and recovery. The collection of toner cartridges began in 1995 in Japan and the Americas and in 1999 in Europe. Each of these regions has also started recovering cartridges. China and Taiwan will follow in November 2000.

Recycling of Photosensitive Drums

Ricoh's production-related subsidiary in the United Kingdom, Ricoh UK Products, had earlier undertaken the recycling of products. In particular, its multilayer recycling system for reusing the main part of the copier—the photosensitive drum—has received high acclaim, winning the Queen's Award in the U.K. in 1993 and the European Better Environment Award for Industry in 1994.

Recycling of products at Ricoh UK Products

New Approaches toward Resource Conservation

To more effectively reduce environmental impact, the Ricoh Group began promoting "From One R (recycle) to Three Rs (recycle, reduce, reuse)," i.e., in addition to recycling products and materials, one needs to reduce resource exploitation and reuse collected parts and units. We are in the process of creating new design policies and a system for the future manufacturing of copiers.

Developing Products Based More on Reuse than on Recycling

Ricoh turns recyclable designs into reuse-oriented designs. Copiers are sorted by unit and job, i.e., paper loading, paper feeding, and ink fixing, following fixed standards for unit size and interunit interfacing. We are able to upgrade machines by simply replacing units and parts with newer ones that are better suited to meet the needs of the times. Accordingly, it may soon be possible to have your machine upgraded right in your own office instead of having to purchase a new one.

The Concept of Reuse Will Affect Manufacturers As Well As Products

If the concept of reuse takes hold in society, manufacturers will no longer be providing products but rather functions or services contained within those products. Furthermore, manufacturing strategies will gradually shift from those based on recycling, i.e., focusing on how to reuse things, to those based on life cycles, i.e., focusing on the entire life cycle of products and the manufacturing of those products. Under the concept of reuse, manufacturers will become "life cycle service providers."

Units designated by Ricoh are removed for reuse.

Plastic materials made from disassembled and sorted plastic parts will be categorized into three grades to be reused in manufacturing other Ricoh products.

Ricoh Kyushu's Recycling Center: the Recycle Tech

Resource Conservation and Recycling (Business Sites)

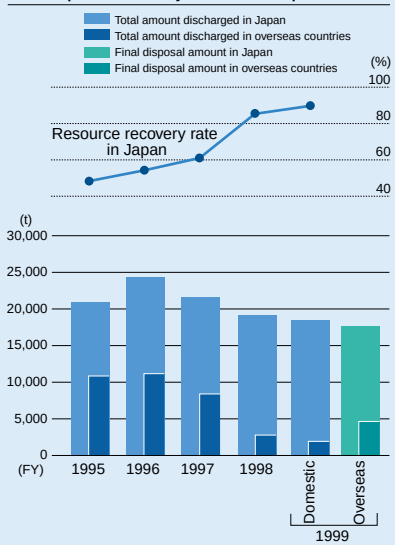
◎Zero Waste Plants and Perfect Production

What kinds of waste are generated at plants? Most are extra raw materials that were not needed in manufacturing a product. If production sites would use only the amount of raw materials needed to make their target number of products without any being left over, wastes would be minimized with no loss in energy or personnel expenses. Our goal is not just to establish such zero waste activities but to continue them. First of all, the Ricoh Group's comprehensive "entrance management" of plants regarding materials procurement centers on the concept of preventing wastes from being generated instead of being recycled. We pay close attention to ways in which we can reduce the environmental impact of the packaging used for our finished parts and products while improving the productivity of production lines. All our activities are carefully planned to realize perfect production (achieving maximum results with minimum resources) and the kind of ideal plant our customers expect us to be.

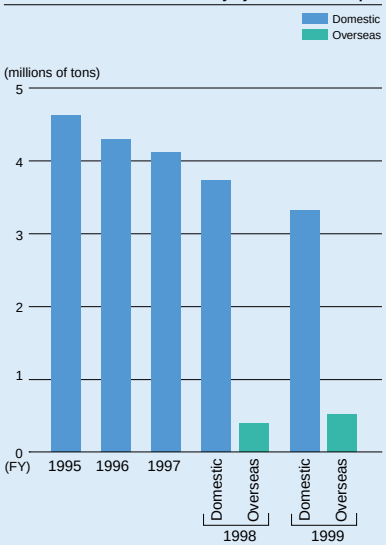
Goals and Progress

- Ricoh is to reduce final waste 90%, compared with that of fiscal 1992, by the end of fiscal 2001.
- ▶ In fiscal 1999, final waste was reduced 89.4%.
- Achieve a 100% resource recovery rate (zero waste) at all domestic production sites by the end of fiscal 2000.
- ▶ As of March 2000, seven business sites (Ricoh Fukui, Ricoh Numazu, Ricoh Gotemba, Ricoh Hatano, Ricoh Atsugi, Ricoh Unitechno, and Part Component System's Sagamino Plant) achieved zero waste. All business sites are to achieve zero waste by the end of fiscal 2000.
- Achieve a 70% resource recovery rate at all domestic nonproduction sites by the end of fiscal 2000.
- ▶ Achieved 59.6% in fiscal 1999.
- Achieve a 100% resource recovery rate (zero waste) at all overseas production sites by the end of fiscal 2001.
- ▶ As of fiscal 1999, zero waste has not been achieved at any site. However, Ricoh Industrie France continues to achieve a 99% resource recovery rate.

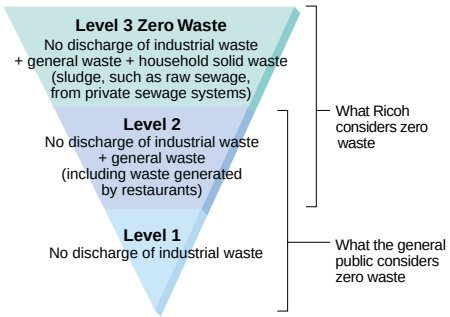
Resource Recovery Rate/Amount of Waste Discharge/ Final Disposal Amount by the Ricoh Group



Volume of Water Used in Industry by the Ricoh Group



Definition of Zero Waste Levels



The Ricoh Group's Zero Waste Achievements (Fiscal 1999 Results)

Ricoh Fukui	Level 3
Ricoh Numazu	Level 3
Ricoh Gotemba	Level 2
Ricoh Unitechno	Level 2
Ricoh Hatano	Level 2
Ricoh Atsugi	Level 2
Part Component System's Sagamino Plant	Level 2

◎Zero Waste by the Ricoh Group

The Ricoh Group classifies zero waste (100% resource recovery rate) into three levels. Although zero waste is roughly defined as no industrial waste being generated (level 1), the Ricoh Group aims at also eliminating general waste (level 2) and household solid waste, such as sludge (e.g., raw sewage), from private sewage systems (level 3). Ricoh

Recycling Examples (Some activities at the Ricoh Numazu, Ricoh Ikeda, and Ricoh Fukui plants)

Classification	Type of Waste	Product	After Recycling
Level 3 (Industrial waste + general waste + household solid waste) / Level 2 (Industrial waste + general waste) / Level 1 (Industrial waste)	Paper	Unusable copier paper	Recycled copier paper and toilet paper
	Wood	Used pallets	Particle boards
	Metal	Swarf and cutting scraps	Recycled metal
		Aluminum tubes of photosensitive drums	Automobile parts
	Liquid	Fluoroboric acid waste liquid	Fluorite
		Ammonium sulfate	Raw materials for paint (deep blue color)
		Acid solvent	Recycled oil
		Diazo compound liquid waste	Recycled zinc
	Sludge	Sludge	Cement
		Toner waste	Toner bottle caps and reducing agents
	Plastic	Ribbons and film	Solid fuel and reducing agents
		Other plastic waste	Roadbed materials
Level 3 (Industrial waste + general waste + household solid waste) / Level 2 (Industrial waste + general waste)	Flammables	Laminated cardboard	Laminated cardboard
		Wooden boxes	Particle boards
		Polyethylene terephthalate bottles	Business cards, work clothes, and plastic folders
		Cigarette butts, tissue paper, etc.	Fuel (incinerated residue=fused slag)
		Newspapers and magazines	Toilet paper
		Paper cups	Recycled paper cord
		Disposable wooden chopsticks	Particle boards
	Nonflammables	Bottles; porcelain; and glass waste, such as fluorescent lamps	Permeable blocks, glass wool, porcelain, etc.
		Beverage cans	Recycled metal
		Dry cell batteries	Recovered mercury and recycled metal
		Leftover food	Manure
Level 3 (Industrial waste + general waste + household solid waste)	Household solid waste	Raw sewage	Soil-improving agents

Fukui and Ricoh Numazu achieved level 3 zero waste in fiscal 1999. Regarding incinerated waste as being disposed, we aim at achieving perfect resource recycling.

Loss Configuration Chart to Minimize Waste Discharge

To minimize loss in production lines, the Ricoh Chemical Industry Division prepared a Loss Configuration Chart. The identification of processes where losses may occur as well as the materials that are lost improves efficiency and leads to perfect production.

Recycling Toner Waste

Ricoh Industrie France sells copier toner waste as raw materials for additives used in the foundry of steel and alloy. This effort, combined with lower processing costs, has lead to an annual savings of EU19,700 (approximately ¥2 million).

Swarf Compressor and Recovered Oil

Ricoh Elemex, which engages in metal processing for watches, gas meters, and water meters, has developed a swarf compressor. Curly swarf for reuse is compressed 1/12 in quantity for steel and 1/24 for aluminum. In addition, 50% of the cutting oil that remains on the metal is recovered for reuse. Ricoh Elemex also sells their swarf compressors as part of its environmental conservation activities.

Swarf compressor (above) and compressed swarf (right)

Recycling of Paper Used in Performance Tests

The Ricoh Elemex Ena Plant promotes the reuse of paper used in the performance tests of copiers and other equipment. Ricoh Elemex commissions neighboring welfare facilities to remove staples and pack the used paper to be reused at its plants. In this way, Ricoh Elemex eliminates the need to purchase and use new paper.

Reuse of Lens Cutting Solution

Ricoh Optical Industries, an optical equipment manufacturer, designed a machine that would allow the company to reuse the cutting solution it uses in the manufacture of glass lenses. Used cutting solution that contains abrasive materials and glass is processed in a centrifuge and filtered to be reused. A way to reuse lens cleaning solution is also being studied.

System to reuse lens cutting solution

Biological Processing of Sludge

To achieve level 3 zero waste, which includes household solid waste, it is important to improve wastewater processing facilities. Ricoh Atsugi's biological wastewater processing system for industrial and household sewage reduced 28 tons of sludge that used to be discharged monthly to zero, achieving an annual savings of ¥1.2 million.

Minimum Use of Water Resources

To wash its thermal paper production line, Ricoh Industrie France required 30m^3 of water daily in 1996. By 1998, it had cut this volume 50%, to below 15m^3. Ricoh Atsugi, Ricoh Unitechno, and Taiwan Ricoh have installed wastewater recycling systems to filter and reuse plant wastewater in their toilets, and Ricoh Yashiro has constructed a closed recycling system to achieve resource recovery of wastewater.

Database on Recycling Companies

To achieve recycling smoothly and the proper disposal of waste in the Ricoh Group, the Group has constructed a database on recycling companies that allows each Ricoh site to search for recycling companies, their contact numbers, and the type of waste handled (with certification).

Reuse of Office Supplies

Ricoh Unitechno and Ricoh Optical Industries effectively reduce cost and the use of resources by using used office supplies, consumables, laminated cardboard, and plastic bags collected at the reuse section.

Reuse section (Ricoh Optical Industries)

Zero Waste at Nonproduction Sites

Fukui Ricoh, a Ricoh Group dealer, created the Environmental Management Division in June 1999 to begin environmental conservation activities. The dealer currently sorts its waste into 32 categories, resulting in the near achievement of zero waste. The program contributed to reducing waste processing costs from ¥301,000 to ¥95,000.

Economic Benefits of Zero Waste Plants

Costs at Ricoh Numazu, which achieved zero waste in February 1999, fell ¥56.95 million[1]. The company achieved this by implementing green procurement (a campaign promoting the avoidance of purchases that may generate waste), by merging and integrating packaging methods into a system that simplifies packaging and makes use of reusable containers. Furthermore, other carefully thought-out methods were developed, including the use of liquid waste produced in the manufacturing process as cement materials. As a result, green procurement reduced costs ¥20.8 million and waste processing expenses ¥32.4 million[2]. A strict sorting program allowed some of the waste to be sold as resource, making a profit of ¥9.1 million.

1. Costs compared were for fiscal 1996, when zero waste activities began, and for fiscal 1998, when the plant almost achieved zero waste.
2. Compared with 1996 figures

◎ Five Rs Toward Zero Waste

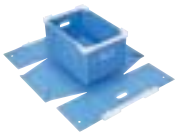
Based on the five Rs—refuse → return → reduce → reuse → recycle—the Ricoh Group is taking active steps toward realizing “perfect production=zero waste” with the cooperation of suppliers and recycling companies.

1) Refuse (Avoid buying anything that may become waste)

Minimum resource exploitation is being embraced by both the Ricoh Group end and suppliers by simplifying packaging for parts and raw materials. Many business sites are carrying out similar activities, such as buying 100% recycled toilet paper sans packaging or core.

2) Return (Return what can be returned to suppliers)

Such improvements in delivery containers as designing them to be reusable and returning them to suppliers not only use less resources but also reduce costs. Ricoh Unitechno has developed a foldable, reusable container, dubbed Fladan, which is used within the company and sold commercially.



Foldable, reusable container Fladan

3) Reduce (Reduce waste)

“Waste when mixed but resource when sorted.” The efficient sorting of waste improves the resource recovery rate and can lead to profit if sold as a resource. Several business sites have abolished the use of personal wastebaskets in an attempt to further reduce the amount of waste thrown away and to promote the recovery of resources.

4) Reuse

Reusing discarded products that had been used only once results in resource conservation and cost reduction. At Ricoh Ikeda, customers are asked to cooperate in collecting trays used in the delivery of ICs. The reuse of trays decreases the amount of plastic materials used.

5) Recycle

We are studying resource recovery methods as well as establishing a network with recycling companies. Methods of resource recovery include material recycling, which simply reuses materials without changing their form; chemical recycling, which reuses materials after processing them chemically; and thermal recycling (energy recovery), which reuses materials as fuel to generate heat energy.

Zero Waste Plants

The Ricoh Group promotes zero waste activities based on the five Rs mentioned on page 45.
The following are some ideas given by Ricoh Numazu to achieve level 3 zero waste.

Start with Entrance Checking: Do Not Buy Products that May Generate Waste.

Whatever is not used in a plant will become waste. As for packaging and containers for parts and raw materials, Ricoh Numazu examines how each of its 3,302 parts and raw materials is delivered. Ricoh Numazu works with suppliers to propose such improvements as simplified packaging, reusable containers, or the use of tankers for delivery instead of drums. Such efforts helped both

Ricoh and its suppliers reduce costs and waste.

As another example, a review of restaurant operations as part of zero waste promotion activities revealed an inordinate amount of leftover rice. To reduce this waste, the restaurant began serving rice in three sizes (large, medium, and small).

Seek and Secure at least Two Recycling Routes.

If it is impossible to substitute materials that become waste, it is necessary to recycle the waste they generate. Ricoh Numazu makes inquiries to the manufacturers of the materials regarding recycling routes. This will allow Ricoh Numazu to secure recycling routes of their own or at least gain some clues into recycling methods from the manufacturers' in-depth knowledge on the disposal of the materials they sell. We have several alternative recycling routes that are always available so that we can manage cost and be prepared for any emergency that could happen to our main recycling routes.

Use Displays to Attract New Ideas.

Setting up displays on specific examples of recycling can also be highly effective. Visibility promotes the further understanding of recycling. With it, we can identify what is being thrown away, i.e., not being recycled, and attract new ideas on solving this kind of problem. A display on sorting worked when we were targeting business site employees. The display showed how sorting is linked to recycling.

Encourage All Employees to Participate in Zero Waste Activities: The Importance of Establishing Rules that Can Be Easily Followed.

Consider the detailed sorting of wastepaper at business sites. The issue is what will the wastepaper be recycled into. Careful sorting is not required if wastepaper is to be recycled into toilet paper or laminated cardboard. It is also important not to have rules for sorting that are too exacting. It is as important for employees to set easy-to-follow rules as it is for them to observe those rules.

A box for waste that employees are unable to classify until they improve their knowledge on sorting from the person in charge of recycling

A panel with easy-to-follow directions on sorting

The Numazu Central Recycling Market in Ricoh Numazu
The mall-like sorting center contributes to expanding employee awareness of zero waste activities.

Energy Conservation (Products)

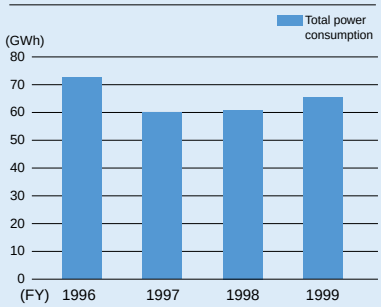
◎Concept of Energy Conservation

Unlike household appliances or automobiles, most office equipment, such as copiers, facsimiles, and printers, are on 24 hours a day, either in standby mode or in operation. Therefore, the most important considerations in office equipment are the capability of conserving power while in standby, starting up quickly from standby, and using less power while in operation. We also focus on improving duplex copying because efficient paper use is also considered as energy conservation.

Goals and Progress

- Reduce the energy consumption per product 30%, compared with that of fiscal 1996, by the end of fiscal 2001.
- ▶ In fiscal 1999, energy consumption for black-and-white copiers was 92.5%* that of fiscal 1996.
  * See notes to the Annual Power Consumption graph below for calculations.
- ▶ In fiscal 1999, energy consumption for facsimiles was 59.6%* that of fiscal 1996.
  * See notes to the Changes in Energy Consumption of facsimiles graph below for calculations.
- Increase the speed of duplex copying and the number of types of recyclable paper that can be used in copiers to promote the efficient use of paper and thus reduce CO_2 emissions during paper manufacturing.
- ▶ The duplex* copying/printing function of copiers and laser printers was improved through advanced paper feed technology. Some series of copiers marketed in fiscal 1999 were able to sustain 100% duplex copying productivity while continuously printing.
  * Duplex copying productivity (%) = (Time spent on simplex → duplex copying)/(Time spent for simplex → simplex copying) 100
- ▶ Paper weighing 64g/m² can be used in all copiers, facsimiles, and printers marketed in fiscal 1999. Recycled paper containing 70% or more recovered paper can be used in all copiers, facsimiles, and printers marketed in fiscal 1999.

Annual Power Consumption of Hybrid Machines, Copiers, Facsimiles, Printers, and Color Hybrid Machines Sold



◎Power consumption in fiscal 1999 increased from that of fiscal 1998 due to a significant increase in the number of color hybrid machines sold.

◎The figures above were calculated according to data on the number of units sold and the amount of power consumed by category in an attempt to improve data accuracy. The figures in the 1999 issue of the Ricoh Group Environmental Report were calculated according to power consumption, the total number of units marketed in each given year, and categorized by copying speed and are therefore different from their corresponding figures given above.

◎The calculation of power consumption is as follows:

Copiers, hybrid machines, and color hybrid machines:

Annual energy consumption = Energy consumption efficiency [Wh/h]* × the number of units sold, assuming the units are in operation eight hours a day, 240 days a year

Facsimiles:

Annual energy consumption = Energy consumption in standby mode [Wh/h] × the number of units sold, assuming the units are in operation 24 hours a day, 365 days a year.

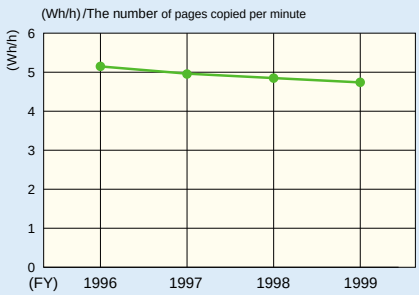
Printers:

Annual energy consumption = Energy consumption in standby mode [Wh/h] × the number of units sold, assuming the units are in operation eight hours a day, 240 days a year.

The sum of these three figures is designated as total power consumption.

*Energy consumption efficiency was measured in accordance with the Ministry of International Trade and Industry's Law Concerning the Rational Use of Energy.

Changes in Energy Consumption of Copiers



◎Negligible reductions in power consumption were the result of a transition in the market from analog machines to (digital) hybrid machines that have higher energy consumption efficiecy. We are planning to achieve our goal with the introduction of energy conservation technologies in the future.

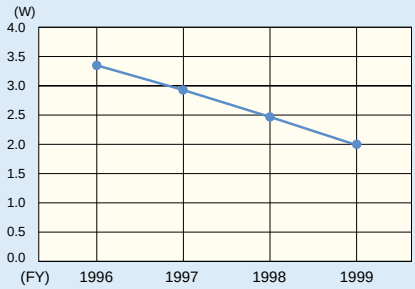
◎Energy conservation values for copiers are calculated as follows:

Σ (Energy consumption efficiency [Wh/h])[1]/ (copying speed[2]) × the number of units marketed)/Σ the number of units marketed

1. Energy consumption efficiency was measured in accordance with the Ministry of International Trade and Industry's Law Concerning the Rational Use of Energy.
2. Copying speed = the number of pages copied per minute

◎In the 1999 issue of the *Ricoh Group Environmental Report*, data on power consumption by product group was based on Σ (Energy consumption efficiency [Wh/h]) × the number of units marketed)/Σ the number of units marketed. However, this calculation does not account for copying speed and is therefore inexpedient since the energy conservation capabilities of copiers with different operating speeds cannot be evaluated. The 2000 issue adds copying speed into the equation, enabling the energy conservation capabilities of copiers with different operating speeds to be evaluated based on the amount of energy consumed per page.

Changes in Energy Consumption of Facsimiles



◎The energy conservation capabilities of facsimiles are stable due to the adoption of technology[1] developed for the RIFAX BL110.

◎Energy conservation values for facsimiles are calculated as follows:

Σ (Energy Star energy consumption in standby mode[2] [W])/(printing speed[3]) × the number of units marketed/Σ the number of units marketed

1. See page 48.
2. Energy Star energy consumption in standby mode=energy consumption in standby mode pursuant to the standards of the International Energy Star Program
3. Printing speed = the number of pages printed per minute

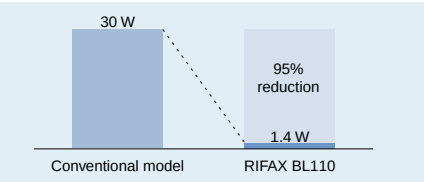
Standby Mode Energy Conservation Technologies for Facsimiles

In general, all ordinary facsimiles have to be in standby mode to receive transmissions. In 1996, Ricoh developed a CPU dedicated to energy conservation and incorporated it into a hybrid facsimile the company marketed as the RIFAX BL110. This machine achieved an approximate 1.4 W[1] power consumption, a 95% reduction from the 30 W consumption of Ricoh's conventional machines. As of 1999, there are more than 550,000 facsimiles operating with this technology all around the world. The total amount of energy thus saved[2] is equivalent to that consumed by 200,000 households in Tokyo. Ricoh will be applying this technology to its facsimiles extensively.

1. In standby mode for energy conservation
2. A five-year period of use is assumed in the calculation.

RIFAX BL110

Comparison of Power Consumption while in Standby Mode



Energy Conservation Technologies for Machines in Operation

The development of energy conservation technologies for copiers and printers can be rephrased as the history of improvements in the rate of thermal efficiency. A considerable amount of power is used when copiers and printers transfer toner from the thermal drum onto the paper and permanently affix it with heat. Ricoh is not only developing toner transfer technologies but also improving energy efficiency by installing appropriate wattage heaters in its machines.

Advanced Technologies for Energy Conservation

Ricoh has developed a small ISDN G4 unit that realizes energy conservation in high-speed G4 facsimiles. G4 facsimiles are superior to conventional G3 machines in terms of transmission speed and image definition. The application of the G4, however, was restricted to high-end business-use due to the need of installing an ISDN line. G4 facsimiles with the newly developed ISDN G4 unit consume 80% less power in standby mode than those without. Moreover, fewer key parts in the G4 translates into a downsizing of the machine and a cost reduction in its manufacture. Consequently, the RIFAX SL3300, a G4 facsimile, achieves a low 2.2 W power consumption in standby mode even with the G4 unit. The worldwide popularity of the Internet has increased the number of ISDN line subscriptions and installations. Ricoh succeeded in making this high-end technology available to more people while decreasing environmental impact.

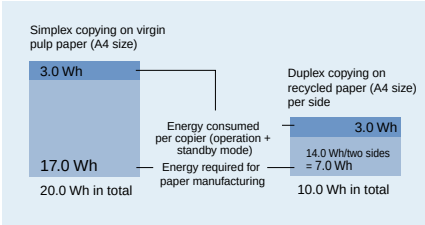
RIFAX SL3300 equipped with the newly developed environmental conservation-oriented ISDN G4 unit

Improved Duplex Copying, Less Global Warming

Photocopying generates CO_2, and in Japan approximately 776,000 tons[1] of copier paper are used every year. This is equivalent to roughly 2,328,000 tons of CO_2[2]. These figures cannot be ignored in view of global warming. If virgin pulp paper is used to make copies, about 20 Wh[3] will be consumed for each page. This includes the energy to manufacture the paper. On the other hand, 100%-recycled paper reduces the CO_2 generated during production, and duplex copying further reduces environmental impact by about half. Thanks to improved technologies, including Ricoh's paper feed method, the imagio MF5570 has achieved high-speed duplex copying of 55 pages per minute[4], which is the same speed for simplex copying. Machine operation is made easy as well in order to facilitate use by as many people as possible. Ricoh puts considerable efforts into marketing recycled paper as part of its contributions toward reducing energy used in paper manufacturing.

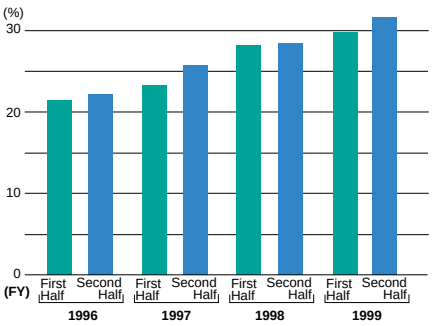
1. Source: *Paper and Pulp Statistical Table*, Ministry of International Trade and Industry.
2. Source: Ricoh's LCA examples announced at the 1997 meeting of the Electrophotography Society of Japan. (See page 20.)
3. Specified machines under certain conditions were used to calculate the figure; numerical values may differ according to machine type or conditions.
4. A4 size, continuous copying mode

Comparison between Simplex and Duplex Copying in Terms of Energy Consumption



imagio MF5570

Recycled Paper Sales



Energy Conservation (Business Sites)

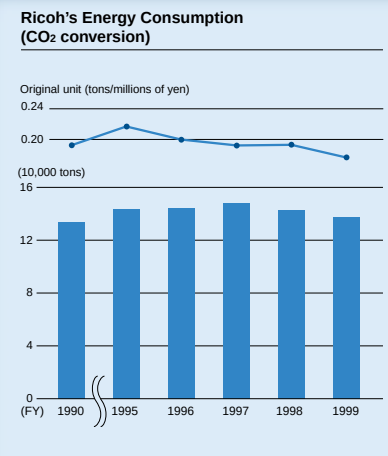
◎Concept of Energy Conservation at Business Sites

The Ricoh Group is developing energy conservation activities, based on its Eco Balance* concept, that will take efficiency and economic benefits into consideration. Activities include the introduction of cogeneration systems at business sites that tend to have larger environmental impact.

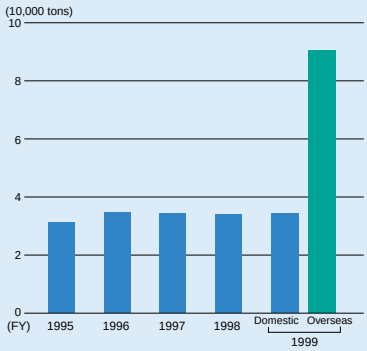
*See pages 11 and 12.

Goals and Progress

- Ricoh is to reduce CO_2 emissions at least 15% by the end of fiscal 2001 on a per sales basis, compared with those of fiscal 1990.
  (Domestic and overseas production sites other than Ricoh's have set numeric goals of 15% or more each.)
- ▶ Ricoh reduced CO_2 emissions 10.3% in fiscal 1999, compared with those of fiscal 1990. Six domestic production subsidiaries out of seven reduced CO_2 emissions 24.5–66.7%.



Ricoh's Energy Consumption (CO_2 conversion)



Energy Consumption at Production Sites Other than Ricoh's (CO_2 conversion)

Cogeneration Systems

Ricoh Numazu began using a cogeneration system in November 1999. Accordingly, half the plant's power supply, which was once provided solely by power companies, is now complemented by an in-house generation system using city gas. Furthermore, waste heat produced by the generator is effectively used to cut total annual cost and CO_2 emissions 3,000 tons. The Central Research Center has also adopted a cogeneration system.

Innovative Manufacturing Line Significantly Reduces Power Consumption

The unusual design of Ricoh Unitechno's manufacturing line helps the plant conserve energy. Conventional manufacturing lines consist of multiple conveyor belts driven by a large motor, and regardless of the length, there would be only one line. Ricoh Unitechno's new manufacturing line consists of carts chained to one another in a single line. The length of the "cart line" can be adjusted by adding or subtracting any number of carts. This new system only needs a single 400 W motor to run while conventional lines need one that is in the 5–6 kW range. As a result of this new design, 45.8 kg of CO_2 emissions can be cut per day, to 2.2 kg per day, or approximately 95% less than those of conventional lines.

Examples of Energy Conservation Activities at Business Sites

Because the Ricoh Group regards energy as an important resource, the Group's business sites plan beneficial energy conservation activities, aiming at producing the maximum effect using the minimum amount of energy. We also believe that sharing the know-how the business sites have gained will improve the energy conservation efforts of the Group as a whole.

Elimination of Climatic Factors

To promote efficient energy conservation at business sites, it is necessary to eliminate the influential factors of an area's climate. Ricoh Optical Industries, which is located in Iwate Prefecture—an area where the temperature can drop to -7°C in winter—attempts to eliminate the influence of the area's climate by using double windows, resin window frames, or adiabatic film on windows. Most plants in the Ricoh Group apply adiabatic paint to their roofs so that the building can be cooled more efficiently and, in the process, save the energy that would have been used for air-conditioning in the summer.

Double windows with a resin window frame

Windows covered with adiabatic film

Roof painted with adiabatic paint

Partial Air-Conditioning by Gas Heat Pump

Ricoh Optical Industries uses a gas heat pump air-conditioning system to lower CO_2 emissions. The system provides partial air-conditioning during overtime hours, cutting CO_2 emissions and energy costs roughly by half, compared with air-conditioning that uses electricity.

Reflective Sheets Used with Fluorescent Lighting

Reflective sheets with aluminum evaporating film were attached to fluorescent lamps, making them approximately twice as bright as before. As a result, only half the number of fluorescent lamps is now needed.

Solar- and Wind-Powered Generators for Parking Lot Lighting

Ricoh Atsugi replaced its old parking lot lighting facility with solar- and wind-powered generators. There were no significant cost involved in the installation since no wiring was required. The new system saves ¥480,000 in electricity bills per year. Also, 11.4 tons in CO_2 emissions were cut.

Improve Air-Conditioning Efficiency by Lowering the Ceiling

As part of its plant renovations, Ricoh Optical Industries lowered the ceiling of the building to improve the efficiency of its air-conditioning. This also resulted in the need for fewer fluorescent lamps.

Energy Conservation of Air Compressors

Most plants belonging to the Ricoh Group use air compressors to operate production line equipment. Ricoh Fukui connects ducts to its air compressors to channel in fresh air, which is cooler than the air inside the plant, to reduce power consumption.

Switching from Kerosene to City Gas to Heat Boiler

Ricoh Ikeda switched from using kerosene to city gas as its boiler fuel in September 1999, taking the surrounding residential area into consideration. The switch is expected to reduce CO_2 emissions 1,000 tons annually.

Energy Conservation in Clean Rooms

Ricoh Atsugi and Ricoh Optical Industries have several clean rooms that they inspect in a variety of ways and that focus on energy conservation. The inspections cover the relationship between room temperature and condensation as well as how clean the rooms at start-up. The two plants promote energy conservation by setting the level of the clean rooms in accordance with the requested quality of products.

Pollution Prevention (Products)

◎Concept of the Pollution Preventing Capabilities of Products

Such environmental certification as Germany's BAM or Scandinavia's Nordic Swan Mark set high standards for chemicals contained in and emitted by products. Yet, we have set up an environmental certification that is even more stringent than either of the above in order to minimize the use and emissions of chemicals that are hazardous to the environment. Moreover, in compliance with requests from citizen groups and in line with newly enacted laws and regulations, we have created manufacturing techniques that have less environmental impact.

We control the chemicals contained in our products and the flow of chemicals in the manufacturing process using the Ricoh Environmental and Chemical Safety Information System (RECSIS). We are also developing a system that will provide the timely disclosure of information on the use of chemical substances as requested by our customers, OEM partners, and citizen groups.

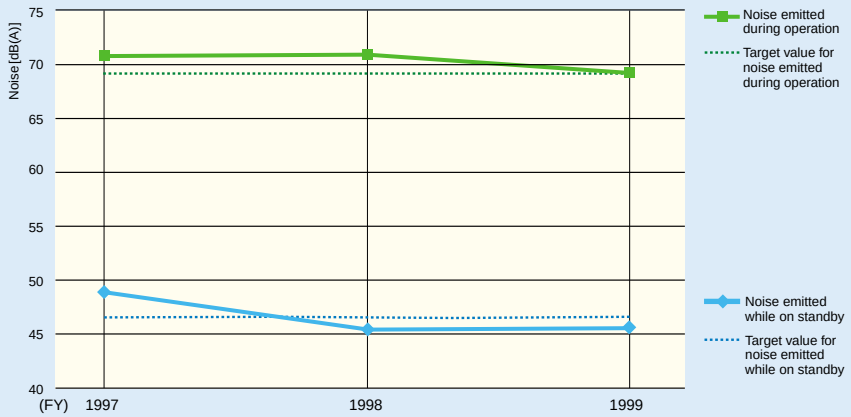
Goals and Progress

- Reduce the volume of specified chemical substances, such as lead and PVC, at least 50% on a per product basis in all products introduced in fiscal 2001, compared with products introduced in fiscal 1997.
- ▶ Lead-free solder, polyolefinic harnesses, and hexavalent-chromium-free steel boards are to be used in all products marketed in and after fiscal 2001.
- Reduce the level of noise emitted at least 2 dB and emissions of ozone and other by-products at least 20% for all copiers, facsimiles, and laser printers introduced in fiscal 2001, compared with products introduced in 1997.
- ▶ As of fiscal 1999, the level of noise emitted during operation was reduced 1.7 dB and that while on standby was reduced 2.5 dB, compared to 1997 levels. Ozone emissions were reduced 20%, despite a slight increase in dust emissions, compared with those of fiscal 1997.

* Calculations are based on the weighted number of copiers sold and uses a productivity of 50 sheets per minute for all machines.

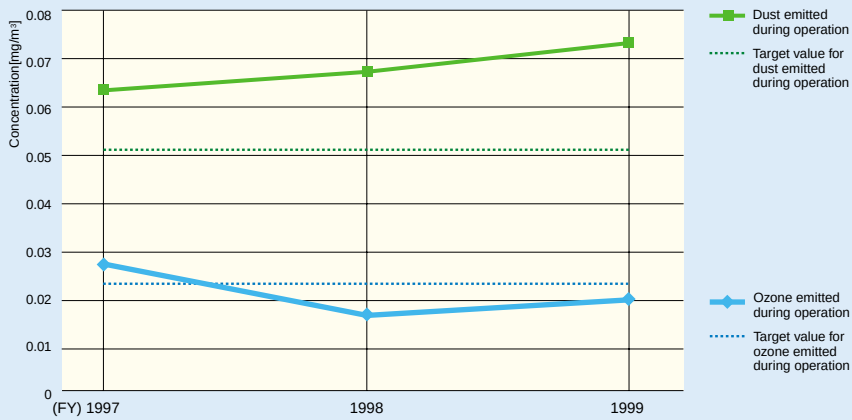
Changes in the Level of Noise Emitted by Machines in Operation

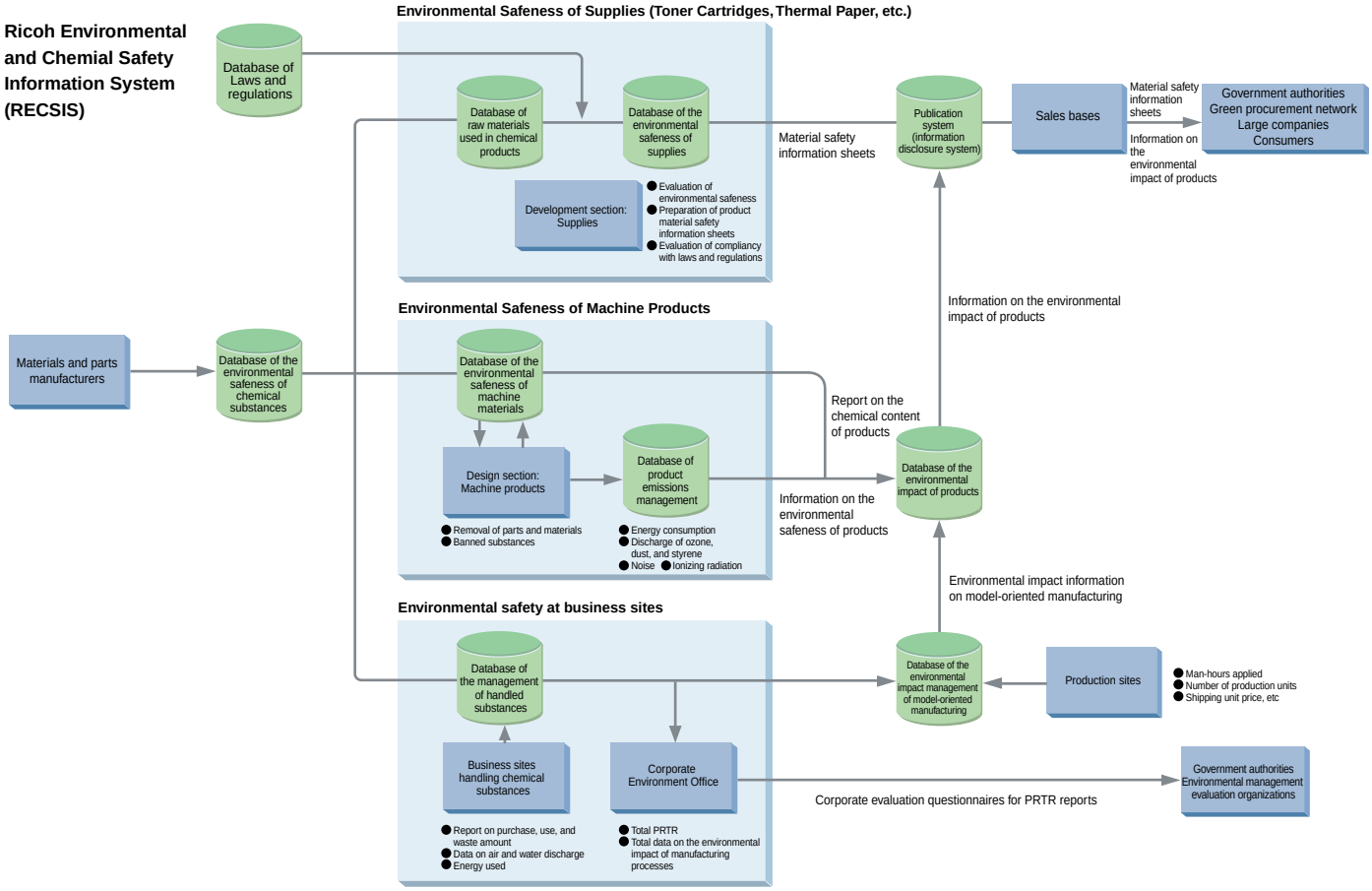
* Calculations are based on the weighted number of copiers sold and uses a productivity of 50 sheets per minute for all machines.



Changes in the Level of Chemical Substances Emitted by Machines in Operation

* Calculations are based on the weighted number of copiers sold and uses a productivity of 50 sheets per minute for all machines.





Ricoh Environmental and Chemical Safety Information System (RECSIS)

There are many substances that, while useful for a product's manufacturing process, have undesirable effects on the environment. The use of these substances needs to be controlled so that they can be properly disposed of, collected, or phased out. RECSIS, Ricoh's chemical substance management system, contains data on 164 items based on such ISO standards as those for the more than 2,000 types of chemical substances listed, environmental hazards, toxicity, and emergency procedures. RECSIS also covers laws and regulations, including amendments, concerning the use of these chemicals in other countries. In addition, we have begun collecting data on the chemical contents of parts and materials purchased by the Ricoh Group and managing data on the use and volume of emissions and waste from chemical substances at the manufacturing sites of our suppliers. Through these efforts, we are now able to improve our products and business sites enough to achieve our pollution prevention targets.

Reduction of Hexavalent-Chromium and PVC

Ricoh has decided to use chromium-free steel boards, which do not need a zinc coating, in all copiers scheduled to be released in fiscal 2001. The company has long been looking for a chromium-free steel board that can perform adequately in electromagnetic wave prevention and intensity but that does not contain harmful hexavalent-chromium, and it has finally developed one that meets these requirements.

The use of PVC has been prohibited in 1993, pursuant to our recyclable design policy, except in materials used to coat electric wire. PVC may produce hydrogen chloride and dioxins, depending on the method of incineration. Using substitute materials for electric wire coating is expected to reduce the use of PVC by 50% by the end of fiscal 2001, compared with products marketed in 1997.

Acquisition of International Certification at Noise Testing Center

Ricoh's Noise Testing Center acquired certification based on ISO standards in 1998. This certification certifies the technical ability of the test center and the reliability of test results reported. Ricoh is the first in Japan to have acquired certification by the National Institute of Standards and Technology (NIST) of U.S.A. on noise testing.

Noise Testing Center in Ricoh Omori

Pollution Prevention (Business Sites)

◎Concept of Pollution Prevention at Business Sites

The Ricoh Group's chemical substance management system categorizes substances that fall under Japan's PRTR* Law as well as substances that are used in other parts of the world according to whether they are to be prohibited, reduced, or controlled. In line with our severe self-regulation policies, we endeavor to control as well as to reduce the amount used, emitted, and disposed of. We have also dealt with soil pollution caused by chloric organic solvents through the use of surveys, improvement planning, and the subsequent publication of the *Ricoh Group Soil Improvement Manual*, which outlines stricter self-regulation measures than the environmental standards set by the Japanese government. We are currently conducting surveys and carrying out improvements at Ricoh Group production and research and development sites.

*Under the PRTR system, the release of potentially harmful environmental pollutants into the air, water, and soil; product contents; and the transfer of waste are assessed by businesses, among others. The results are totaled and released by a third-party organization. Member countries of the Organization for Economic Cooperation and Development (OECD), such as the United States, Canada, the U.K., the Netherlands, and Japan, have adopted PRTR. The PRTR Law in Japan was based on this system.

In fiscal 1997, Ricoh participated in the PRTR system that Keidanren independently started prior to its legislation by giving it a summary of the PRTR data of all Ricoh business sites. We continued to report the PRTR data of all Group companies in fiscal 1998 and thereafter began reducing the consumption and emission of PRTR substances.

Soil Surveys

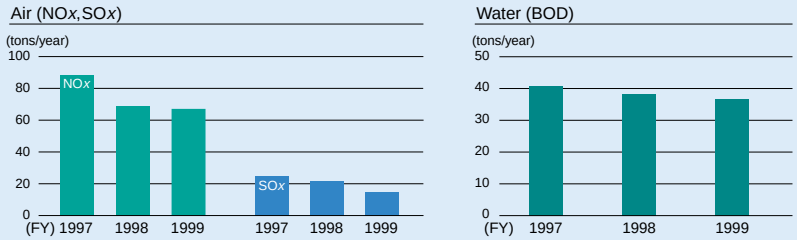
All domestic production and research and development sites of the Ricoh Group conducted surveys of the presence of chloric organic solvents in soil and underground water and reported their findings to relevant local governments. Business sites that needed improvement conducted more detailed surveys and cleanup activities pursuant to the water purification plan. There were no problems in the surrounding areas of any site. Surveys are underway for overseas production sites, and additional surveys and cleanup activities are scheduled to be conducted, depending on results.

Goals and Progress

- The Ricoh Group is to reduce the use of substances subject to PRTR at least 20% and emissions 50% or more, compared with those of fiscal 1997, and completely eliminate landfill waste by fiscal 2001.
- ▶Substance use was reduced 13.2% and emissions 16.7% in fiscal 1999.
- The Ricoh Group is to completely eliminate the use of trichloroethylene and tetrachloroethylene by fiscal 2001.
- ▶The use of trichloroethylene was completely eliminated at all domestic and overseas business sites as was the use of tetrachloroethylene at all domestic business sites. Only one overseas business site currently uses tetrachloroethylene and is expected to completely eliminate its use in fiscal 2001.
- Restrict the use of dichloromethane to the manufacturing of existing organic photosensitive materials by the end of 2001 and completely eliminate its use by the end of fiscal 2007.*

*New addition in year 2000.

Changes in the Amount of Substances Discharged Following the Ricoh Group's Implementation of Pollution Prevention Measures



NO*x* and SO*x* calculations were changed to better reflect fuel consumption performance because data measured at business sites, which was calculated based on the concentration of gas emissions, was dispersed. Therefore, the figures presented above differ from those in the 1999 issue.

Response to Chloric Organic Solution Pollution in Soil and Underground Water*

* The areas surrounding business sites were not affected.

	History of the use of relevant substances[1]	Current status
Ricoh Gotemba	—	—
Ricoh Fukui	—	—
Ricoh Yashiro	—	—
Ricoh Ikeda	○	No pollution[2]
Ricoh Atsugi	○	No pollution[2]
Central Research Center	○	No pollution[2]
Applied Electronics Research Institute	○	No pollution[2]
Ricoh Hatano	○	Cleaning completed[3]
Ricoh Numazu, South Plant	○	Cleaning completed[3]
Ricoh Numazu, North Plant	○	Cleaning completed[3]
Ricoh Omori	○	Cleaning underway[4]
Ricoh Unitechno	—	—
Ricoh Microelectronics	○	No pollution[2]
Ricoh Optical Industries	○	Cleaning completed[3]
Hasama Ricoh	○	Cleaning underway[4]
Tohoku Ricoh	○	Cleaning underway[4]
Ricoh Elemex, Okazaki Plant	○	Cleaning underway[4]
Ricoh Elemex, Ena Plant	○	Cleaning underway[4]
Ricoh Keiki	○	Cleaning underway[4]

1. ○ = Available — = Not available
2. No pollution: No pollution exceeding environmental standards was detected inside or outside the business site.
3. Cleaning completed: Pollution exceeding environmental standards was detected, and site was cleaned.
4. Cleaning underway: Pollution exceeding environmental standards was detected, and site is being cleaned.

Development of Water-Based Paint

Ricoh Industrie France has developed a water-based paint that has been in use since November 1998. The use of the paint lowered the emissions of volatile chemical compounds 83%, compared to those from solvent-based paint that was previously used in the manufacturing process of products. The lower temperature and shorter time needed to bake on water-based paint reduce costs and energy requirements. As a result, annual cost dropped approximately EU27,000, or ¥2.8 million.

Solvent Gas Collection and Disposal Devices

To reduce the usage or emissions of PRTR substances, Ricoh Fukui uses a device to collect and recycle organic solvent gas generated in the manufacturing process. The plant uses a direct solvent gas burner to reduce the amount and density of emitted gas, which is further treated in a deodorization process.

Direct solvent gas burner

Preventing the Evaporation of Washing Solution

To prevent the washing solution used in cleaning parts from evaporating, and thereby reducing cost, Ricoh Optical Industries float plastic balls approximately 2 cm in diameter on the surface of the solution. An experiment showed that evaporation would be reduced by half using this technique.

Survey Results on Substances* Subject to PRTR and the Self-Regulation of Exhaust Pollutants in the Ricoh Group

* Substances designated by five electric/electronic organizations and not covered by the PRTR Law.

(tons/year)

Substance	Amount	Emission in Air	Amount Consumed	Amount Reduced	Amount Transported (Waste Taken Off-Site)	Amount Recycled
Zinc chloride	43.4	—	41.1	—	—	2.3
Zinc oxide	143.1	—	141.3	—	1.0	0.8
Antimony oxide	12.0	—	11.4	—	0.4	0.3
Xylene (mixture)	12.3	10.0	0.1	0.0	0.9	1.3
Dichloromethane	234.3	180.7	—	—	2.9	50.8
N, N-dimethylformamide	26.3	1.2	—	—	—	25.0
Tetrachloroethylene	6.3	0.1	—	—	—	6.2
Copper I oxide	2.4	—	2.4	—	0.1	—
Copper II oxide	110.3	—	108.9	—	0.8	0.6
Trichloroethylene	2.7	0.9	—	—	—	1.8
Toluene	1,124.0	530.8	65.4	166.2	2.0	359.6
Nickel sulfate	12.1	—	5.2	—	—	6.9
Barium sulfate	4.8	—	4.5	—	0.2	0.0
Aluminum sulfate	1.5	—	0.5	—	—	0.9
4,4-isopropylidenediphenol	43.9	—	34.8	—	—	9.1
Ethylene glycol monoethyl ether	25.2	0.8	—	10.3	—	14.1
Glyoxal	20.8	—	18.1	—	—	2.7
Cerosolob Acetate	15.5	0.9	—	—	14.6	—
1.3-dichloro-2-propanol	9.2	9.2	—	—	—	—
Silicon carbide	1.2	—	1.2	—	—	—
Tetrahydrofuran	92.5	48.4	—	30.0	0.4	13.7
Tetrafluoromethane	1.4	1.0	0.4	—	—	—
Hexafluoroethane	2.7	1.9	0.8	—	—	—
Lead solder	31.9	—	22.1	—	0.0	9.8

Data for substances amounting to at least one ton per year ("—" indicates no entry.)

Machine used to wash parts

Closeup of plastic balls used to prevent evaporation

Monitoring of Environmental Impact

Ricoh Industrie France, which is located in a scenic area, takes measures to conserve the environment and monitors the effects of its plant on the environment. The company tests the quality of underground water periodically and stores containers of used chemical substances in a specific area to prevent the risk of leakage of those substances during rain.

Ricoh Industrie France

The Ricoh Group's Environmental Conservation Activities (1976–March 1999)

	The Ricoh Group's Activities	Society's Recognition of Ricoh's Activities		Worldwide Trends	
1976	Establishes Environmental Promotion Section			1971	Environment Agency set up Ramsar Convention adopted
1978	Establishes Environment Measurement Center			1977	United Nations Conference on Desertification held
1980	Starts manufacturing aluminum ingots at Tohoku Ricoh as part of its recycling system				UNEP conference held
1989 April	Establishes the Committee to Address Chlorofluorocarbons			1987	Adopts Montreal Protocol
1990 March	Discontinues use of styrene foam plastic packaging material that contains ozone-depleting substances			1990	London meeting (set phase-out of CFCs and HCFCs)
July	Markets Shigen recycled paper in Japan				
September	Markets Ricoh Recycling Copy recycled paper in Germany				
September	Proposes used paper collection and recycling system using Risapost (Ricoh in-house collection system)			1991	Recovered Resource Use Promotion Law enacted
December	Sets up Environment Administration Office				
1991 July	Markets the imagio MF 530 Series copier with energy-saving features				
1992 February	Establishes Ricoh's General Principles on the Environment			1992	UN Conference on Environment and Development (Earth Summit) held
March	FT5570 copier awarded the BAM (initial version)				
October	Announces the Ricoh Environment Symbol				
1993 March	Achieves total elimination of ozone-depleting substances (specific kinds of chlorofluorocarbons (CFCs), specific kinds of halon, carbon tetrachloride, etc.)			1993	Energy Saving Law revised
May	Announces the recycled product design basic policy and implements recyclable design level 1	1993 May	Ricoh UK Products' copier photosensitive drum recycling technology receives the Queen's Award in the U.K.		
May	Launches material labeling on plastic parts				
December	The Ricoh Group achieves total elimination of ozone-depleteing substances (specific kinds of CFCs, specific kinds of halon, carbon tetrachloride, etc.).	September	Ricoh UK Products' Power Consumption Reduction Activities receives the Business Energy Award's Grand Prize.		
1994 January	Creates the Ricoh Environmental Management System Committee	1994 January	Awarded the Kanto Trade and Industry Bureau Director's Prize for activities to rationalize electricity use at Ricoh Gotemba		
March	FT6655 copier awarded the BAM (second version)				
August	The Comet Circle concept is completed.	May	Copier photosensitive drum recycling technology of Ricoh UK Products receives European Better Environment Awards for Industry.		
October	Presents a case of LCA of toner cartridge buffer material at RECY '94 in Germany				
November	Markets resource-saving and energy-saving copiers around the world (marketed as the spirio 2700/3500 series in Japan)				
November	Implements labeling of materials and grade on plastic parts			1995	The First Conference of Parties to the United Nations Framework Convention on Climate Change (COP1) held
November	Implements recyclable design level 2				Container Packaging Recycle Law implemented
1995 February	Holds First Ricoh Company Environment Competition	1995 February	Ricoh Central Research Center receives Kanto Electricity Use Rationalization Committee Director Award for its cogeneration system.		International Energy Star Program implemented
February	Publishes first edition of *Ricoh Environmental Management System Guidelines*				
March	Markets the FT4000/5000 Series resource-saving and energy-saving copier in Japan and Europe	March	Ricoh product environmental assessment and recyclable design promotion activities receive a Resource Recovery Development Business Commendation: the Minister of International Trade and Industry Prize.		
June	Holds First Tohoku Ricoh Environment Fair				
August	Wastewater treatment closed system starts operations at Ricoh Yashiro.				
October	Announces International Energy Star certified products				
December	Ricoh Gotemba acquires ISO 14001 certification (the first certification given by a Japanese certification organization).				

	The Ricoh Group's Activities	Society's Recognition of Ricoh's Activities		Worldwide Trends	
1996 February	Holds Second Ricoh Company Environment Competition				
March	Chemical substances management system RECSIS starts operations.				
July	Ricoh UK Products acquires BS 7750/ISO 14001 certification.	1996 June	Ricoh Corporation (United States) wins Energy Star Office Equipment Prize.	1996	ISO Environmental Auditing Standards of Environmental Management System established International Energy Star Award launched by EPA COP2 held
November	Implements recyclable design level 3				
1997 February	Holds Third Ricoh Company Environment Competition				
February	Opens Ricoh Kanto Recycling Center				
March	Sets 79 types of management chemical substances	1997 March	Ricoh Corporation wins Energy Star Copier Prize.	1997	COP3 held
September	Announces eco-packaging LCA case at the Eco-Material International Symposium	June	Ricoh UK Products receives UK BSI-QA Prize.		
October	Six copier models awarded the Nordic Swan Mark (Scandinavian environmental label)				
1998 March	Holds Fourth Ricoh Company Environment Competition	1998 February	Combined copier/facsimile device RIFAX BL110 acclaimed as a "superior device for saving energy" and received the Chairman's Prize of the Japan Machinery Federation	1998	COP4 held Eco Partnership Tokyo Conference held Law Promoting Countermeasures against Global Warning established
March	Draws Ricoh Environmental Action Plan				
April	Reorganizes Environment Administration Office to Corporate Environment Office				
April	Ricoh establishes the Recycling Division.	March	Ricoh Corporation wins Energy Star Imaging Device Prize.		
April	Revises Ricoh's General Principles on the Environment	June	Ricoh Atsugi recognized for its environmental conservation activities in Kanagawa Prefecture		
May	Issues *Ricoh Group Green Procurement Guidelines*				
September	Ricoh Omori's Noise Testing Center receives first NIST (National Institute of Standards and Technology) international certification in Japan.				
October	Ricoh Fukui achieves a 100% resource recovery rate (zero waste).	October	Ricoh Numazu toner cartridge recycling system receives Westec Award Environment Agency Director-General Prize.		
October	Starts Ricoh Recycle Label System				
October	Holds European Environment Conference sponsored by European region unification company Ricoh Europe B.V.	October	Ricoh Microelectronics awarded 1998 Best Green Plant Award		
October	Announces external cabinet plastic material recycling case at the Eco Balance International Symposium	November	Ricoh ranked top of the electric and electronics industry by German environmental survey specialist company Ökom GmbH		
December	Holds the 1st Global Warming Prevention Business Workshop, organized by WWF Japan, at Ricoh Aoyama Head Office	December	Evaluated as number one in Second Corporate Environmental Management Level Survey by the *Nippon Keizai Shimbun* newspaper		
1999 January	Issues the *Ricoh Group Environment Report 1998*	1999 February	Ricoh Gotemba receives the Director-General of the Agency of Natural Resources and Energy Award from the Ministry of International Trade and Industry for promoting office energy savings.	1999	Revised Energy Saving Law enforced PRTR Law established Special Law on Countermeasures against Dioxin established COP5 held
January	Holds the Fifth Ricoh Company Environment Competition				
February	Ricoh Numazu achieves a 100% resource recovery rate (zero waste).	March	Ricoh and Tohoku Ricoh recognized by the director-general of the Industrial Location and Environmental Protection Bureau, Ministry of International Trade and Industry, for their development of a copier remanufacturing system		
		March	Ricoh Fukui receives the Best Experience Prize for its 100% waste-recycling presentation at the QC Circle National Contest.		

The Ricoh Group's Environmental Conservation Activities (April 1999–May 2000)

The Ricoh Group's Activities

1999 April	Constructs Kyushu Recycle Tech, the new Kyushu Recycling Center
May	Opens Green Cycle Systems, Northern Kanto Recycling Center
May	Ricoh starts training of internal environmental auditors at 11 nonproduction sites.
June	Implements recyclable design level 4
June	The Ricoh Group hosts the America Environmental Convention.
June	Ricoh introduces its environmental volunteer leader training program.
June	Holds the 1st Ricoh Nature Seminar
July	Ricoh completes training of internal environmental auditors at 11 nonproduction sites.
July	Ricoh Electronics (United States) establishes an environmental project group.
July	The Ricoh Group holds the Environmental Management System Screening Standards Seminar pursuant to green procurement guidelines.
August	Ricoh Aoyama Head Office is listed in the Eco-Improvement Office Tokyo Declaration (Type I).
August	Hasama Ricoh obtains ISO14001 certification.
September	Holds the 4th Global Warming Prevention Business Workshop, organized by WWF Japan, at Ricoh Aoyama Head Office
September	Ricoh announces environmental accounting.
September	Issues the *Ricoh Group Environmental Report 1999*
September	Works with environmental volunteer leaders to create a project in which volunteers can enjoy making sandcastles and help clean up a beach
September	Ricoh Ikeda switches to boilers that use city gas to reduce CO_2 emissions.
September	Ricoh contributes all prize money won at the Global Environmental Awards to an NGO in Bangladesh.
September	Ricoh Ikeda participates in an environmental get-together for community residents and explains its corporate approaches to environmental conservation.
September	Ricoh Gotemba achieves a 100% resource recovery rate (level 2 zero waste).
October	Holds the 2nd Ricoh Nature Seminar
October	Ricoh Fukui cultivates and releases killifish into the park pond with the help of neighboring elementary school students.
October	Works with environmental volunteer leaders to create the Okutama: Colored Maple Leaves and Cleanup project.
October	Opens Northern Kansai and Southern Kansai recycling centers
October	Ricoh discloses information on the environmental impact of the imagio MF 6550 through Type III Environmental Labels.
November	Ricoh Unitechno achieves a 100% resource recovery rate (level 2 zero waste).
November	Ricoh Numazu constructs a cogeneration system.
December	Ricoh enters one of its machines in Eco-Products 1999, Japan's first comprehensive exhibition for environment-friendly products.
December	Holds the 1st Company Meeting for Environmental Volunteer Leaders
December	Ricoh employees and their families participate in the Caring for Mr. Seki's Forest activity in Chiba Prefecture.
December	Ricoh Optical Industries acquires ISO 14001 certification along with 23 production bases of the Ricoh Group.
December	Ricoh Hadano achieves a 100% resource recovery rate (level 2 zero waste), the fifth base in the Ricoh Group to do so.

Society's Recognition of Ricoh's Activities

1999 April	Ricoh Corporation receives the Energy Star award.
April	The *Ricoh Group Environmental Report 1998* receives the top Environmental Report Award.
May	Ricoh Fukui receives the Fukui Environmental Activity Promotion Council's Chairman Prize for environmental conservation promotion activities.
May	Receives the Environmental Protection Prize in the Ninth Corporate Contribution to the Society Survey held by the Asahi Shimbun Cultural Foundation
May	Receives the Minister of International Trade and Industry Prize at the Eighth Global Environmental Awards held by the Japan Industrial Journal
June	Ricoh is awarded grand prize at the Green Procurement Awards organized by the Green Procurement Networks.
July	Ricoh Hatano recognized by Kanagawa Prefecture as a superior plant in terms of its self-regulation activities in the area of pollution prevention.
August	Ricoh Fukui recognized for its contributions to the promotion of recycling by the Fukui Prefectural Governor for fiscal 1999
September	Ricoh Electronics declared WRAP Winner by the California state government
September	Ricoh Atsugi receives type 5 certification for its accident-free operations.
October	Ricoh Italy receives the Ecohitech Award (an environmental conservation award).
October	The spirio 5000RM copier receives the Fiscal 1999 G Mark for its ecological design.
October	Ricoh Numazu receives the Japan Recycling Promotion Council Chairman Award.
October	Taiwan Ricoh wins the 1999 Superior Plant in Equipment Operations Award for the Promotion of Pollution Prevention by the Taiwanese government.
October	Ricoh Numazu receives the 1999 Most Technologically Advanced Office Award.
November	Ricoh wins the IEA's Demand-Side Management Award of Excellence in the recently created Copier of the Future Division.
November	The *Ricoh Group Environmental Report 1999* wins the Environmental Report Award for Superior Reports.
December	Evaluated as number one in the Third Corporate Environmental Management Level Survey by the *Nippon Keizai Shimbun* newspaper for the second consecutive year

The Ricoh Group's Activities

2000 January	Ricoh acquires Eco-Mark certification for 28 copier models.
January	Ricoh Logistics starts improving and expanding collection and recycling activities.
February	Ricoh Numazu donates three wheelchairs, which were acquired through the plant's aluminum can collection activity, to Numazu City.
February	Carries out outdoor signboard project organized by environmental volunteer leaders
February	Holds the 3rd Ricoh Nature Seminar
February	Holds the 1st Nationwide Recycling Center Conference
February	Ricoh's digital hybrid machine, the imagio MF 6550, acquires Type III Environmental Impact Disclosure from BVQI (Sweden).
March	Holds the 6th Ricoh Company Environmental Competition
March	Environmental volunteer leaders at Ricoh Fukui engage in cleaning up the roads and parks in the neighboring area.
March	Part Component System's Sagamino Plant (PCS) achieves a 100% resource recovery rate (level 2 zero waste).
March	Holds the Five-Party Environment Meeting
March	Holds the 1st Global Recycling Conference
March	Ricoh Corporation announces the results of its energy conservation activities at the Environmental and Energy Study Institute (EESI) at the U.S. Congress.
April	Opens the Hokkaido Recycling Center
April	Ricoh president, Masamitsu Sakurai, gives a lecture on environmental management at the Nikkei BP Seminar.
April	Engages in afforestation activities organized by environmental volunteer leaders
April	Creates a biotope at Ricoh Fukui
April	Holds the 2nd Company Meeting for Environmental Volunteer Leaders
May	Works with environmental volunteer leaders on a program called Taking Care of Thickets and Outdoor Cooking (Elementary Course)
May	Ricoh begins overseas virgin forest restoration projects.
May	Ricoh Unitechno opens an academy of killifish study at the biotope
May	Holds the 4th Ricoh Nature Seminar

Society's Recognition of Ricoh's Activities

2000 February	Awarded the Fiscal 1999 Kanto Trade and Industry Bureau Director's Prize for the plant's superiority in energy management
February	Ricoh Numazu receives the Minister of International Trade and Industry Prize for its energy conservation activities
February	Ricoh receives the Energy Conservation Center Chairman's Prize, specifically, the Energy Conservation Grand Prize and Special Corporate Prize.
February	Ricoh given a "B" by Ökom, making Ricoh the top ranking company in the IT & Appliance Division
February	Ricoh Optical Industries' "Sweet Pea Circle" receives Grand Prize in the Corporate Division of the Iwate Prefecture Recycling Competition.
March	Ricoh Corporation receives three awards from the Energy Star Program. They are 1) 2000 Energy Star Excellence in Consumer Education Award, 2) Labelling Partners of the Year Award, and 3) Office Equipment Partner of the Year Award (for the fifth consecutive year, the Energy Star Award).
April	Ricoh awarded the Keidanren Chairman's Prize at the 9th Global Environmental Awards
April	Ricoh's environmental advertisement receives the Nikkei Ecology Award at the Fiscal 1999 Nikkei BP Ecology Advertisement Awards.
April	The *Ricoh Group Environmental Report 1999* wins Best Report at the 3rd Environmental Report Awards.
May	Ricoh Unitechno receives the 1st Saitama Environment Award.
May	Ricoh, Tohoku Ricoh, and Fuji Research Institute Corporation work together to study an LCA case on the Quantitative Assessment of Environmental Impact Reduction Activities, which receives the Research and Development Prize in the Foundation Division of the 14th Japan MH Awards.
May	Ricoh ranked top among 39 companies worldwide by Ökom in the IT/Electronics Industry Division

◎Concept of Environmental Report

The Ricoh Group's environmental report aims at presenting the Group's purpose, goals, activities, and results of environmental conservation activities in an easy-to-follow format. We assume that the readers of this report are our customers, suppliers, neighboring communities, employees, NGOs, students, investors, those in charge of environmental issues at other companies, and environmental specialists.

Editing Policy for the 2000 Issue

1. We systematically explain the environmental conservation activities of the Group based on the Comet Circle concept for easier understanding. The contents are neatly classified into such sections as the Group's concepts and goals, basic activities, and specific activities involving products or business sites and the outcome of such activities. We limited the use of technical terms to a minimum, added supplementary explanations, and compiled as many figures and charts as possible to communicate information more efficiently and effectively.
2. It is important that this environmental report provide information accurately and completely. Therefore, we disclose a variety of information, including such negative ones as penalties.
3. The Ricoh Group believes in the importance of reducing the environmental impact of Group activities and that of the industry as a whole. In line with this belief, the information we disclose is presented in an easy-to-understand manner so that other people and other companies who wish to carry out environmental conservation activities of their own will be able to use it.
4. According to the Global Reporting Initiative (GRI), there are three areas that a company needs to concentrate on if it wishes to survive in the 21st century: environmental functions, social functions, and economic functions. With this in mind, the *Ricoh Group Environmental Report* focuses on the social activities, including economic benefits of environmental accounting; social contributions; and environmental conservation activities of the Ricoh Group. To guarantee the factual accuracy of this information, we asked Asahi & Co. to conduct an independent review.

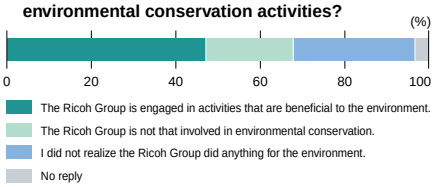
Questionnaires from the 1999 Issue

Beginning with the 1998 issue, questionnaires have been included in the *Ricoh Group Environmental Report* to gather ideas from the readership on creating a better environmental report. We received 335 replies from September 1999 to June 10, 2000, with most of the replies describing the report as being easy to understand and evaluate. We appreciated your enthusiastic encouragement and the honesty that was shown in your answers as well as in your expectations for the Ricoh Group's responsibility to the global environment.

●Questionnaire Results

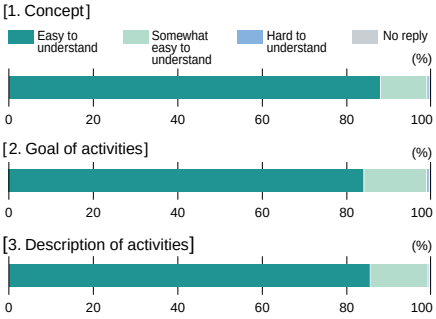
Most of the people who answered our questionnaire were students as a result of our visits to universities to explain our environmental conservation activities and to our direct request to have the questionnaire answered. On the other hand, most replies we received by fax were from employees in charge of environmental issues at their companies.

1. What do you know about the Ricoh Group's environmental conservation activities?

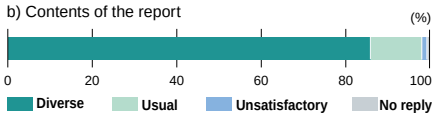


2. What do you think about this report?

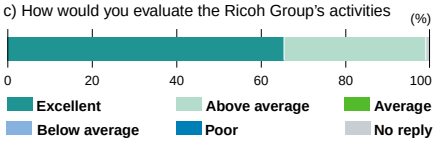
a) Readability of the report



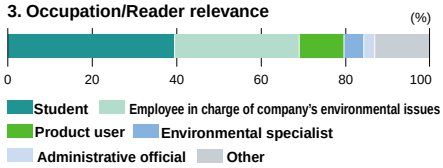
b) Contents of the report



c) How would you evaluate the Ricoh Group's activities



3. Occupation/Reader relevance



●A Few Readership Opinions of the 1999 Issue and Our Response in the 2000 Issue

- "Good reference on obtaining ISO 14001certification."
  "Good reference on environmental accounting."

  ▶ We added more detailed information to the description of our environmental management system and the application of environmental accounting.
- "Site reports should be issued."

  ▶ Ricoh Fukui, Ricoh Unitechno, and Tohoku Ricoh have issued their site reports in 1999.
- "The size of the font made it difficult to read."

  ▶ The 2000 issue has larger fonts for easier reading.
- "There was basically no difference in content between the 1999 issue and the 1998 issue."

  ▶ Drastic changes have been made in the 2000 issue.
- "How accurate are the benefits reported through environmental accounting?"

  ▶ We had an independent review to ensure that the information has been calculated correctly, based on the Ricoh Group's definition, for the 2000 issue.
- "The report was too long."
  "The report should be easy enough for anyone to understand."
  "I want to know more."

  ▶ We have significantly increased the number of pages in the 2000 issue and strove to make the text easier to read and the layout easier to follow.

Number of Copies of the 1999 Environmental Report Issued

- Japanese edition: 45,150 copies (from September 1999 to June 12, 2000)
- English edition: 8,375 copies

Apologies and Corrections for the 1999 Issue

While editing the 2000 issue, a number of mistakes in the 1999 issue were found. The page in the 1999 issue on which the mistake was found followed by the correct information are given below with our sincerest apologies.

1) Page 8

Environmental Action Plan
◎Resource Conservation and Recycling (Business Sites)
●Achieve a 70% resource recovery rate at all domestic nonproduction sites by the end of fiscal 2000.

"Fiscal 2000" should read "fiscal 2001." The oversight was due to a correction made to the action plan in 1999.

2) Page 13

Eco Balance of Overall Corporate Activities (diagram)

"Tentative" should have been added to the diagram title since the environmental impact information system was still being developed.

3) Page 25

Shifts in Discharge of Substances Subject to Pollution Prevention in the Ricoh Group: Water BOD (right bar graph)

The amount of water discharged with sewage was not included in some of the data. The graph on page 53 of the 2000 issue reflects the corrected data.

4) Page 28

Work Environment Measurement (graph)

A few errors were made in the production of the graph. The graph on page 26 of the 2000 issue has been corrected.

Summary of Asahi & Co.'s Review Report

The Ricoh Group received an independent review by Asahi & Co. to ensure the accuracy of the data on environmental performance and environmental accounting used in the environmental report. Asahi & Co. pointed out the areas below. Among others, we shall carefully review "Items that Expect to Be Reexamined" in Article 2 below to improve the items mentioned in the future.

1) Good Points

The *Ricoh Group Environmental Report:*

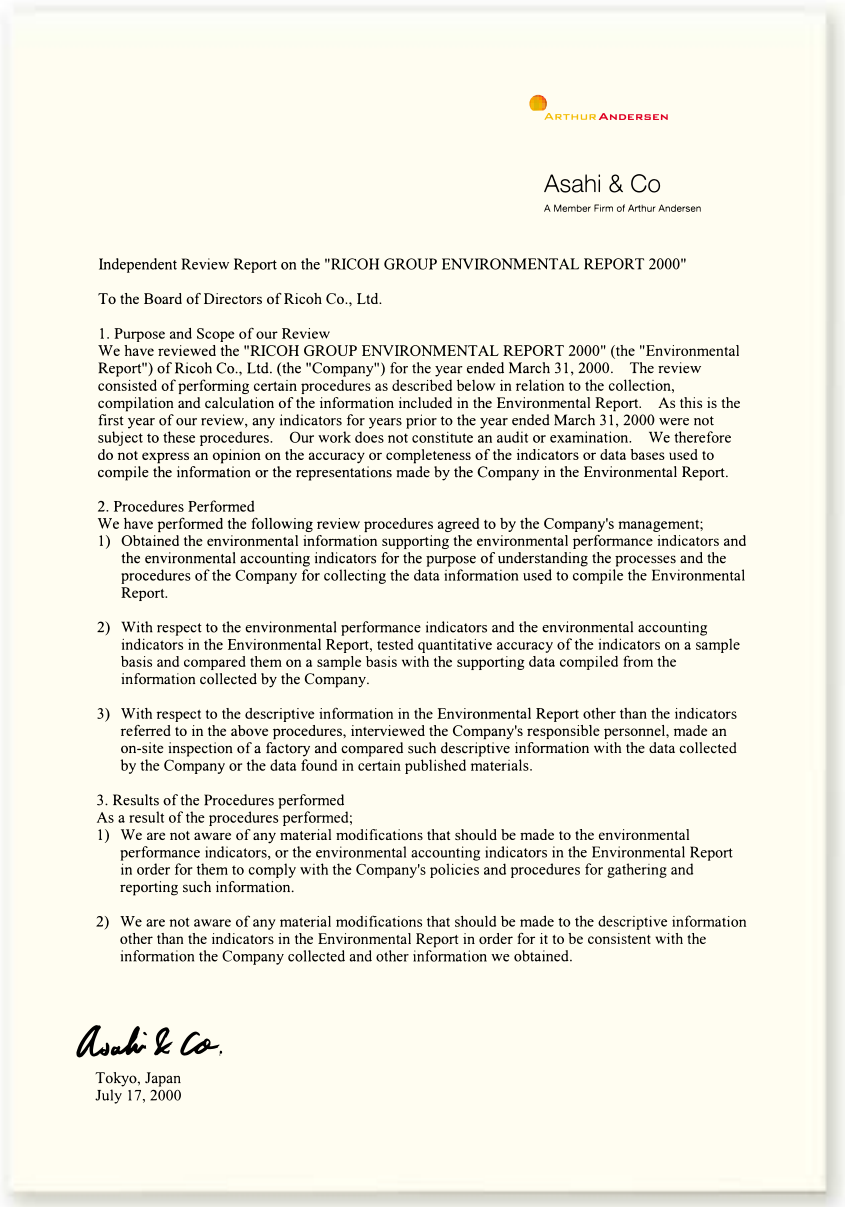
- The report is well-arranged and its presentation on the concept of the Comet Circle is consistent in idea and representation.
- Specific approaches are shown in detail and accompanied by diagrams and charts, making them useful references for a variety of stakeholders.

Environmental Accounting:

- The environmental accounting system enables automatic, prompt, and accurate calculations to be made. The system is well-designed and is more readily available as a management tool.

2) Items that Expect to Be Reexamined

- The practice of inter- and intra- company notification within the Ricoh Group is requested in cooperation with relevant divisions.
- To improve the accuracy of environmental accounting, a follow-up system, such as internal audit reports, will need to be established.
- The *Ricoh Group Environmental Report* needs to be easier to follow and more focused.



ARTHUR ANDERSEN

Asahi & Co
A Member Firm of Arthur Andersen

Independent Review Report on the "RICOH GROUP ENVIRONMENTAL REPORT 2000"

To the Board of Directors of Ricoh Co., Ltd.

1. Purpose and Scope of our Review
We have reviewed the "RICOH GROUP ENVIRONMENTAL REPORT 2000" (the "Environmental Report") of Ricoh Co., Ltd. (the "Company") for the year ended March 31, 2000. The review consisted of performing certain procedures as described below in relation to the collection, compilation and calculation of the information included in the Environmental Report. As this is the first year of our review, any indicators for years prior to the year ended March 31, 2000 were not subject to these procedures. Our work does not constitute an audit or examination. We therefore do not express an opinion on the accuracy or completeness of the indicators or data bases used to compile the information or the representations made by the Company in the Environmental Report.

2. Procedures Performed
We have performed the following review procedures agreed to by the Company's management;
1) Obtained the environmental information supporting the environmental performance indicators and the environmental accounting indicators for the purpose of understanding the processes and the procedures of the Company for collecting the data information used to compile the Environmental Report.

2) With respect to the environmental performance indicators and the environmental accounting indicators in the Environmental Report, tested quantitative accuracy of the indicators on a sample basis and compared them on a sample basis with the supporting data compiled from the information collected by the Company.

3) With respect to the descriptive information in the Environmental Report other than the indicators referred to in the above procedures, interviewed the Company's responsible personnel, made an on-site inspection of a factory and compared such descriptive information with the data collected by the Company or the data found in certain published materials.

3. Results of the Procedures performed
As a result of the procedures performed;
1) We are not aware of any material modifications that should be made to the environmental performance indicators, or the environmental accounting indicators in the Environmental Report in order for them to comply with the Company's policies and procedures for gathering and reporting such information.

2) We are not aware of any material modifications that should be made to the descriptive information other than the indicators in the Environmental Report in order for it to be consistent with the information the Company collected and other information we obtained.

Asahi & Co.

Tokyo, Japan
July 17, 2000

Please send all comments and inquiries regarding this report to:

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● Asahi & Co. conducted an independent review of this report.

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