

Environmental Report

2000

Towards *Kyosei* between People and Nature

Canon

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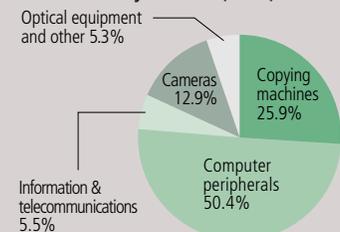
Company Profile

As of December 31, 1999

Name: Canon Inc.
 Representative: Fujio Mitarai, President and C.E.O.
 Sales: ¥1,482.4 billion
 Capital: ¥164.0 billion
 Net income: ¥59.1 billion
 Employees: 21,023 *1
 Main products: Copying machines
 Laser beam printers
 Bubble Jet printers
 Chemical products (toners and cartridges)
 Cameras
 Video camcorders
 Semiconductor equipment
 Broadcast equipment
 Medical equipment

*1 Including temporary staff

Canon Inc. Sales by Product (1999)

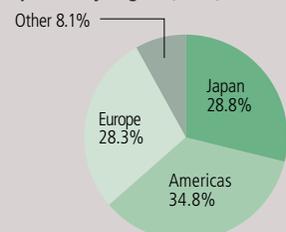


Canon Group (Consolidated)

Net sales: ¥2,622.3 billion
 Employees: 81,009
 Capital expenditure: ¥200.4 billion *2
 R&D investment: ¥177.9 billion *2

*2 Figures are inclusive of regions outside of Japan in accordance with U.S. Securities and Exchange Commission (SEC) standards.

Canon Group Sales by Region (1999)



In 1996, Canon established the Excellent Global Corporation Plan. Based on the philosophy of *kyosei*, or living and working together for the common good, we have challenged to innovate the management to become one of the excellent global corporate group. Our approach towards the environment is an important part of the concept, whose fundamentals are to integrate environment and management by “maximizing resource efficiency” in all of our business activities. We have carried out various measures such as implementing a global recycling program, developing technology and providing products that are environmentally conscious and zero waste activities. It is said that the 21st century will be the “Age of IT Industry” as well as the “Age of Global Environment”. We will make our best effort to contribute to the solutions for global environment issues by minimizing the consumption of global resources and the load on the environment by maximizing resource efficiency. With our group’s collective effort, we will continue to challenge to become a corporation that is esteemed by the people worldwide also in the area of environment preservation, by further development of the technology which we have accumulated to date.



Fujio Mitarai
President and C.E.O.
Canon Inc.

Environmental Charter

Philosophy and Environmental Guidelines

In 1993, we established the Environment Assurance Philosophy and Environment Assurance Guidelines based on *kyosei*, our corporate philosophy. In the Environment Assurance Guidelines, we declared EQCD Policy in which environment assurance comes before all business activities, and all Canon Group as one have been heading for a corporate activity in which the first priority is given to environment assurance.

Corporate Philosophy "Kyosei"

Environment Assurance Philosophy

We aim to help achieve sustainable economic development and harmony between the environment and corporate activities to contribute to worldwide prosperity and happiness.

Environment Assurance Basic Guidelines

Based on the EQCD Policy of harmonization between the environment and its business activities, Canon is actively promoting innovative and dynamic environment assurance-related action plans.

EQCD Policy

E: Environment-Companies incapable of environment assurance do not deserve to continue operations.
Q: Quality-Companies that manufacture products of poor quality do not deserve to sell them.
C: Cost } -Companies that fail to meet cost and delivery requirements do not deserve to compete.
D: Delivery }

1. Actively develop environment assurance technologies for product development, manufacturing, recycling and evaluation, and to disseminate such technologies throughout society.
2. Conduct environmental impact assessments prior to product development/design. Minimize products' impact on the environment by promoting energy/resource conservation and recycling.
3. Promote energy/resource conservation and waste reduction to minimize the impact on the environment of R&D, manufacturing and sales activities.
4. In procuring resources for business operations, give priority to materials, parts and products that have a comparatively low impact on the environment.
5. Examine whether the Group's environment assurance activities are practiced appropriately in line with corporate ethics and social rules and are contributing continuously to the reduction of the Group's impact on the environment.
6. Work together actively with international organizations and government bodies on environmental strategies.
7. As a good corporate citizen, actively support social and local community activities for environmental conservation.
8. Implement Groupwide efforts to boost awareness of environmental conservation among Canon employees through training and education.
9. Pursue environment assurance activities that are transparent and supported by corporate ethics. Actively share environment-related information with others.

Major Objectives in Moving toward the 21st Century

Canon in 2001

Products

- Canon will improve the energy and resource efficiency of its products by 35% (1998 base).
- Canon will recycle, reduce and reuse more than 90% of its used products.

Production

- Canon's production sites will work to prevent global warming by improving energy efficiency (energy consumption to net sales) by 30% and by eliminating emissions of gases that exacerbate global warming, such as PFCs, HFCs and SF₆.
- Canon operational sites will work toward reducing their industrial waste, after the final process, to less than 5% of 1990 levels.

Sales

- Canon will improve its distribution efficiency by 5%, thereby contributing to a reduction of CO₂ emissions.
- Canon will work to eliminate packaging of large products (mid- to high-speed copying machines and laser beam printers) when shipping within regions.

Multi-Activity

- Throughout its products, services and activities, from research and development to manufacturing and sales, Canon will work to eliminate substances hazardous to people and nature, including lead, mercury and chlorinated organic solvents.
- Canon will disclose environmental information about its products and operational sites.
- As a good corporate citizen in every region in which it operates, Canon will actively cooperate with local organizations in environmental protection activities.

1999 Main Activities and Environmental Performance

In 1999 Canon promoted its challenges for environmental preservation mainly in energy and resource conservation and the elimination of hazardous substances as well as in information disclosure. In connection with our products, we have enhanced the technology for conserving energy (on-demand fixing) and established sandwich molding as recycling technology. Also in connection with manufacturing, we have made many achievements such as the implementation of totally closed systems in plants for wastewater, dramatic reductions in emissions of chemical substances, and development of VOCs processing technology. We have also started disclosing environmental information on our copying machines and Bubble Jet printers, by attaching our Type III eco-label, which is a first in Japan. Along with this we are issuing *Environmental Reports* as well as disclosing environmental data on our Web site, which leads us to better information disclosure. (Refer to the Performance Data from Page 44)

- ### Technology Development
- Ozone-free electrical charging technology
 - Technology making VOCs harmless
 - Research of eco-polymers
 - Research of light-reactive water

- ### Development and Design
- Promoting energy conservation designs (on-demand fixing)
 - Enhancing resource conservation (designs for reuse)
 - Enhancing elimination of hazardous substances (lead-free products (lenses), etc.)

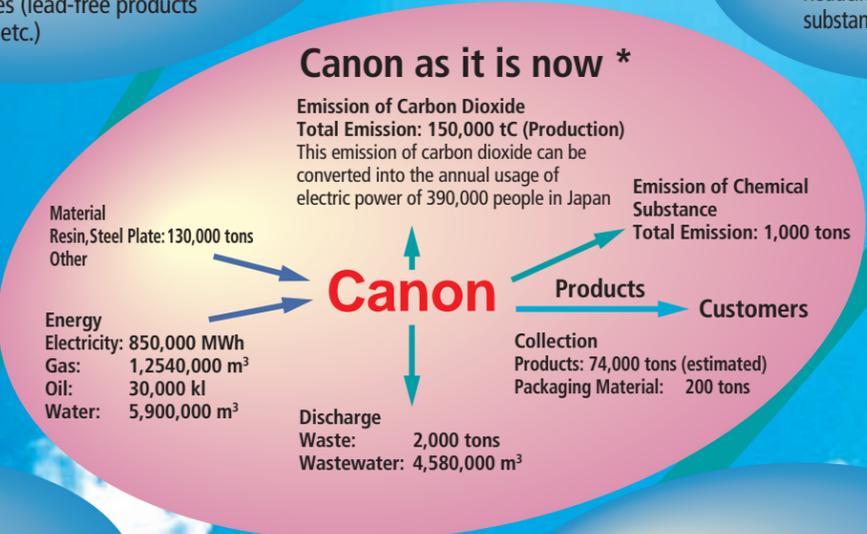
- ### Manufacturing
- Eliminating PFCs, HFCs and SF₆ (except certain usages)
 - Increasing zero-waste sites (27 sites)
 - Implementing complete water circulation system (Oita Canon Materials Inc.)
 - Reducing emissions of hazardous chemical substances by 40% (compared to 1996)

- ### Social Contribution
- Clean Earth Campaign (U.S.A.)
 - Canon Global Environment Beautification Campaign (Canada)
 - WWF Preservation Partner (Europe) etc.

- ### Recycling (ratio of recycling)
- Copying Machine 87%
 - Toner Cartridge 100% (Canon Dalian)
 - Bubble Jet Cartridge 97% (Japan)
 - Stretch Film 50 tons
 - Polystyrene Foam 474 tons

- ### Sales & Marketing
- Establishing and operating collected copying machine exchange center with other manufacturers in the same industry
 - Collecting copying machines, 128,000 worldwide
 - Collecting toner cartridges, 12,175 tons worldwide
 - Collecting Bubble Jet cartridges, 9 tons in Japan

- ### Information Disclosure
- Products Type III eco-label 11 models
 - Publishing *Ecology & Environmental Report*
 - Disclosing environmental data on Web site



* The figures are only for Japan. We have not yet obtained all the figures, however we are planning to disclose them all when they are ready.

Environmental Accounting

Environmental Accounting at Canon

We started our environmental accounting in 1983 by obtaining the figures for the cost of pollution prevention. At that time, the items that we could get hold of were only partial. Since we thought it was important to know how much corporate management resources, such as people, materials and money should be invested in, we have extended and systemized the range to be counted since 1991. For 1999, we made an environmental accounting study team within the company and worked on the figures in accordance with the Environment Agency's Guideline, "For Establishment of Environmental Accounting".

The result of 1999 Environmental Accounting

● Cost calculations

The equipment investment in 1999 was 3.4 billion yen which was 3% less than that of the previous year. Since the adjusted amount in accordance with Environmental Accounting Guideline was estimated at 400 million yen, the actual reduction became 14%. This result was contributed by the fact that the environmental investment in new sites was settled for the time being. On the other hand, the cost was 3% more than that of the previous year after adding 1.5 billion yen due to the change of calculation method.

● Calculation of Effect

We have made two kinds of calculation of the effect; the environmental conservation effect (based on physical amount) and the economic effect from the measures implemented for environmental conservation. However, since it is difficult to calculate the effect from all the costs of environmental conservation, we have decided to report only on the items for which the calculation of the actual effect is possible. The economic effect, in accordance with the environmental conservation measures, is 1.9 billion yen, based on calculations of the actual amount from the effect in 1999. In order to achieve this effect, it cost us a total of 800 million yen for improvement and depreciation, and we are satisfied with the fact that a sufficient investment effect was obtained.

Although we calculated the indirect effect, such as the effect of risk circumvention and contribution to profit using Canon's own method, we are not making reports on them since the social consensus seems not yet sufficient.

Future Development

We think environmental accounting is an effective tool for successful combination of the environmental assurance activities and the corporate management, and the issue is how to bring forward the accounting from now on. We are expanding the areas subjected to accounting to the research and development of environmentally conscious products, the field of product recycling and all the Canon sites including overseas operational sites.

1999 Environmental Accounting

Total Effect Comparison Format (For report Chart C)

About Calculation

The total of 43 business sites in Japan (domestic operational sites listed on page 58) were subject to the calculations. As for the research and development, the calculations were limited to the clear costs for the environmental measures, (recycling, elimination of hazardous substances, eco-materials, etc.)

As for the development of environmentally conscious products and recycling products, we have decided not to make any reports this time. (a calculation method is under review)

Period of calculations: January 1, 1999 - December 31, 1999

Cost

Cost for Environment Conservation		(100 millions of yen)	
Field	Contents	Investment	Cost
(1) Cost within business sites		31.8	56.6
1. Pollution Prevention Cost	Air, Water, Soil, etc.	11.6	31.4
2. Global Environment Conservation Cost	Greenhouse effect, energy conservation, logistics efficiency, etc.	14.7	4.4
3. Resource Circulation Cost	Efficient usage of resource, reduction, separation and recycling of waste, etc.	5.5	20.8
(2) Upstream & Downstream Cost	Green procurement, etc.	0.1	0.8
(3) Management Activity Cost	Environmental education, environment management system, managerial labor cost, etc.	1.3	20.6
(4) Research & Development Cost	Research and development for reduction of the load on the environment	0.7	4.2
(5) Social Activity Cost	Greening measures, environmental information disclosure, environmental ads, etc.	0.5	4.4
(6) Environmental Damage Cost	Soil remediation	0.0	0.1
Total		34.4	86.7

● Definition of Cost Calculation

1. In accordance with the Environment Agency's Guideline, calculations were made for each item by site.
2. All the costs for observance of the laws related to environment are included.
3. When costs are paid for environmental purposes combined with other costs, the actual cost is calculated by deducting the costs for other purposes.
4. If the portion paid for other purposes is not clearly defined, then a closest estimate of 0%, 25%, 50%, 75% or 100% will be applied.
5. The 1999 depreciation of equipment investment is posted as an expense.

Effect

Environment Conservation Effect			Comparison index to 1998 rate of change
Detail	Environmental Load Index	1999 Emission	
	Environmental Load Item		
Effect in Operational Sites	CO ₂ *1	151,892 (tC)	27% reduced
	Chemical substance *2	1,037 (tons)	29% reduced
	Final waste	2,295 (tons)	25% reduced
	Usage of water	5,900,000 m ³	5% reduced

*1 Energy and non-energy CO₂

*2 1,968 kinds of substance that Canon controls

Economic Effect related to Environmental Conservation Measures		(100 millions of yen)
Detail of Effect	Amount	
Income earned by recycling waste	1.6	
Cost reduction by energy conservation	6.5	
Processing cost reduction by recycling waste	3.3	
Cost reduction by increasing logistics efficiency	7.2	
Total	18.6	

● Definition of Effect Estimation

1. The effect of the investment in 1999.
2. The effect caused by the depreciation in 1999.
3. The gain from the sales of hard-assets related to reduction, separation, recycling of waste.

Environmental Cost at Overseas Operational Sites

The cost of overseas operational sites was calculated using our traditional method.

(Millions of yen)

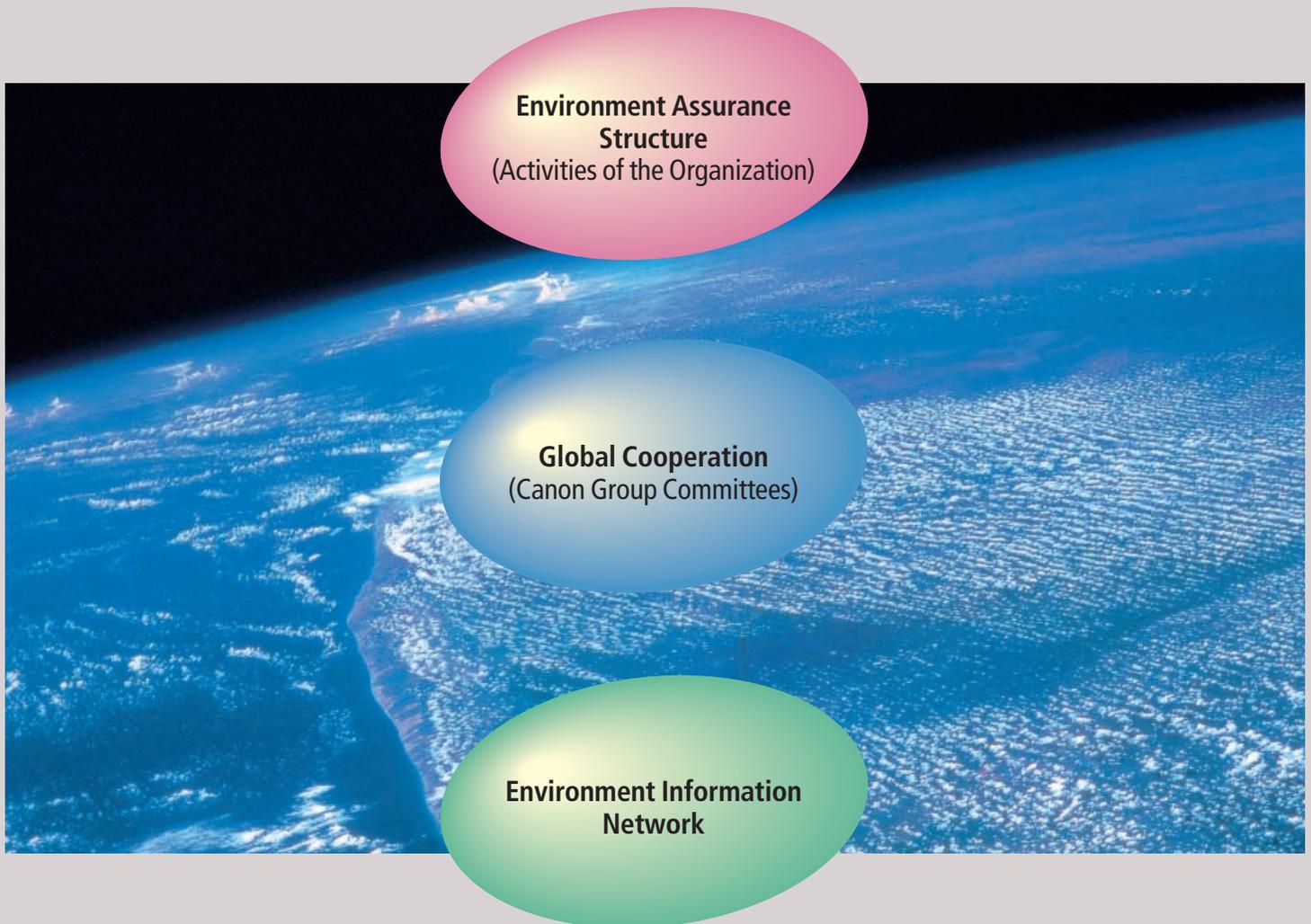
	Investment	Cost for this period
Americas	60	60
Europe	4	39
Asia	70	231
Total	134	330

Global Environment Assurance Structure

Networking, Speed and Quality

The focus on environment assurance spans the entire Canon Group. For this reason, we are pursuing a single global ideal in Japan, the Americas, Europe, Asia and Oceania, in every industrialized and developing country, at all of our development, production and sales sites, and throughout our headquarters, subsidiaries and affiliated companies.

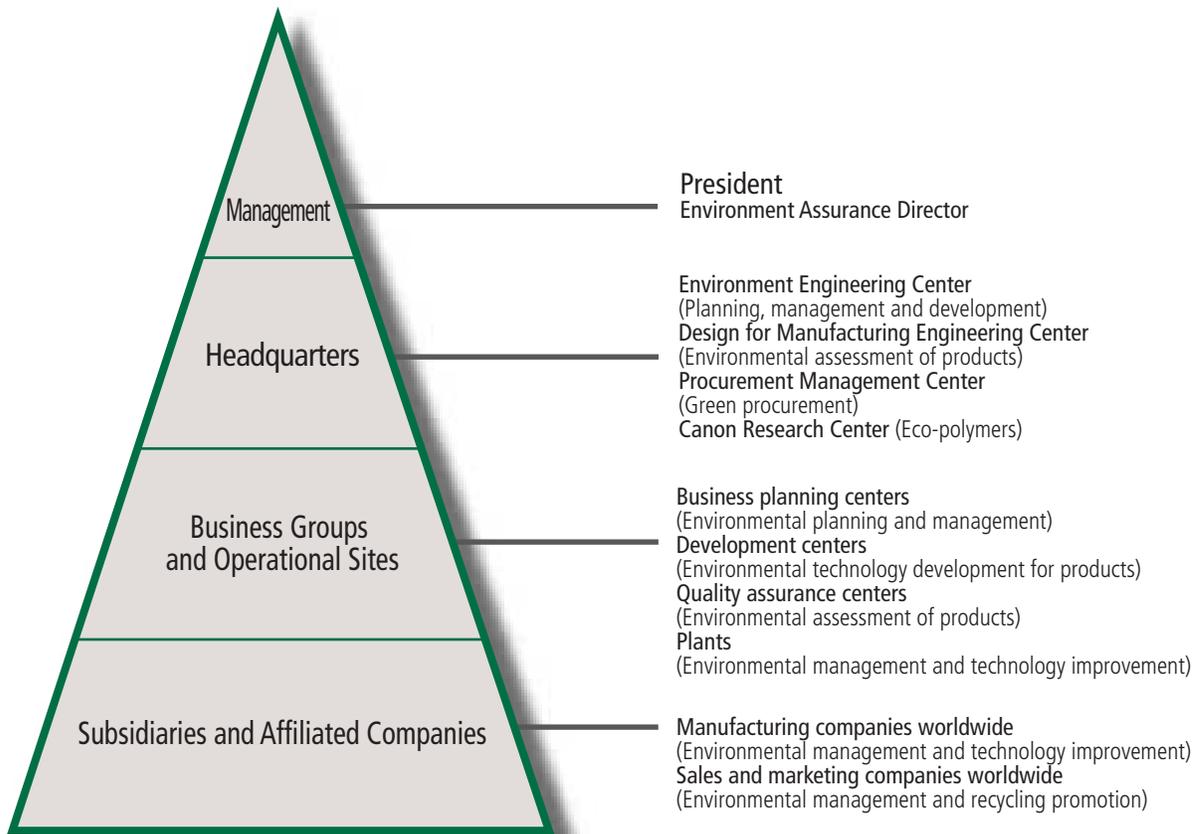
Emphasizing practicality and with a focus on the 21st century, our organization (including our business divisions) and the Canon Group committees are working together on environment assurance activities under the motto of networking, speed and quality.



Environment Assurance Structure Established for R&D, Production and Sales in each Company

Canon considers environment assurance to be an important management issue. We have assigned a director responsible for overseeing environment assurance and establishing unified plans. To make environment assurance activities a continuing part of our daily activities, we have also set up dedicated organizations at each of our sites. Our Groupwide environment assurance activities are coordinated by the Production Management Headquarters' Environment Engineering Center, by Operational Environmental Coordination departments in our six Product Operations, and by Environment Management and Engineering Improvement departments in our worldwide production companies. We also maintain environment management and recycling promotion departments at all of our sales companies.

With the ISO 14001 international environmental management standard as a base, each of Canon's operational sites has established an environment assurance structure. We are working closely together to promote organized environment-focused activities throughout the Canon Group.

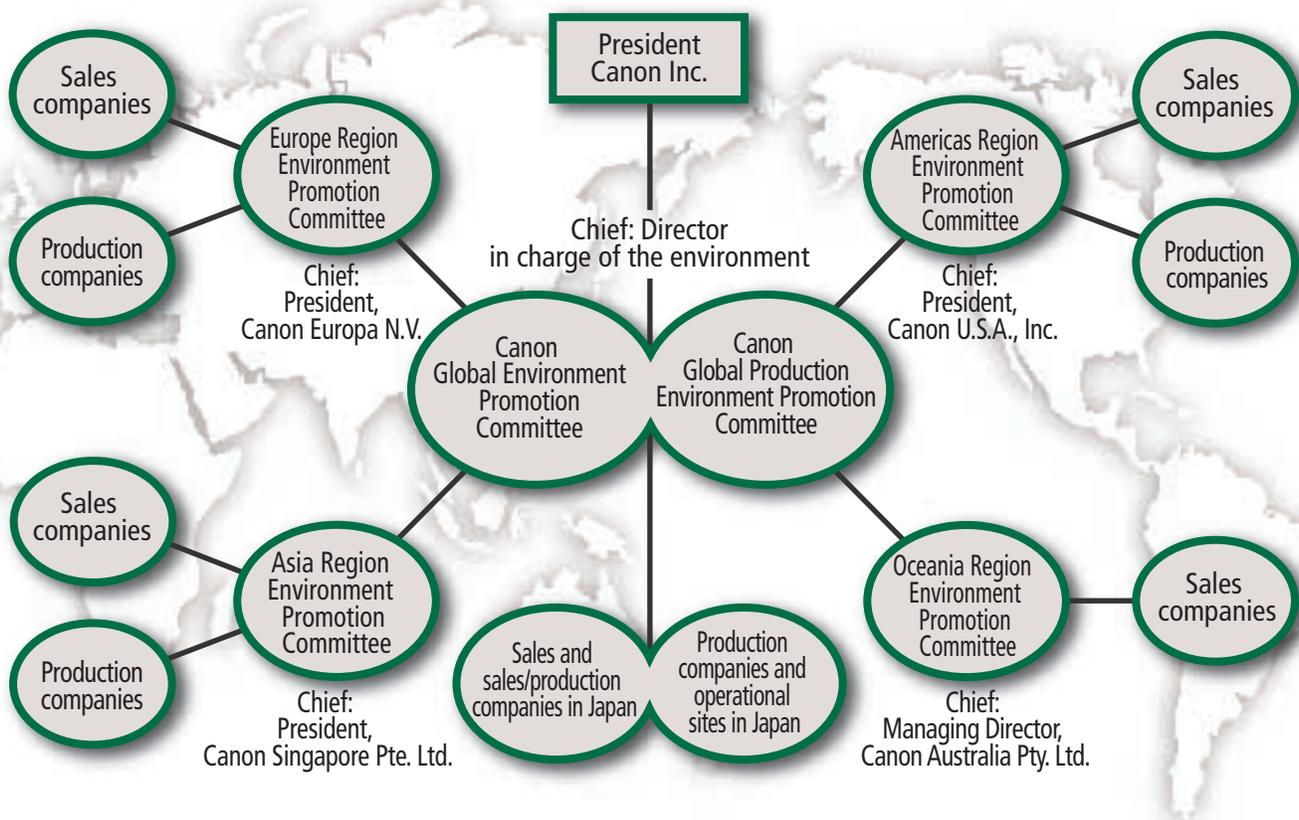


Active Cooperation Between Regional Organizations and Committees under the Global Environment Assurance Structure

The Canon Global Environment Promotion Committee functions on a global level to plan activities involving the development, production and recycling of environmentally conscious products, consumables and containers. Under this committee are five Regional Environment Promotion committees, as well as committees at our sites and affiliated companies that can provide timely responses to environmental issues related to their sites and regions.

The Canon Global Production Environment Promotion Committee represents a strengthening of worldwide cooperation, particularly between Canon Inc. plants and production companies in the Canon Group. The objective of the committee is to promote production activities that are in harmony with the environment. Working to improve the environment, we have also set up Environment Assurance Operational Management committees for operational management at each of our manufacturing sites.

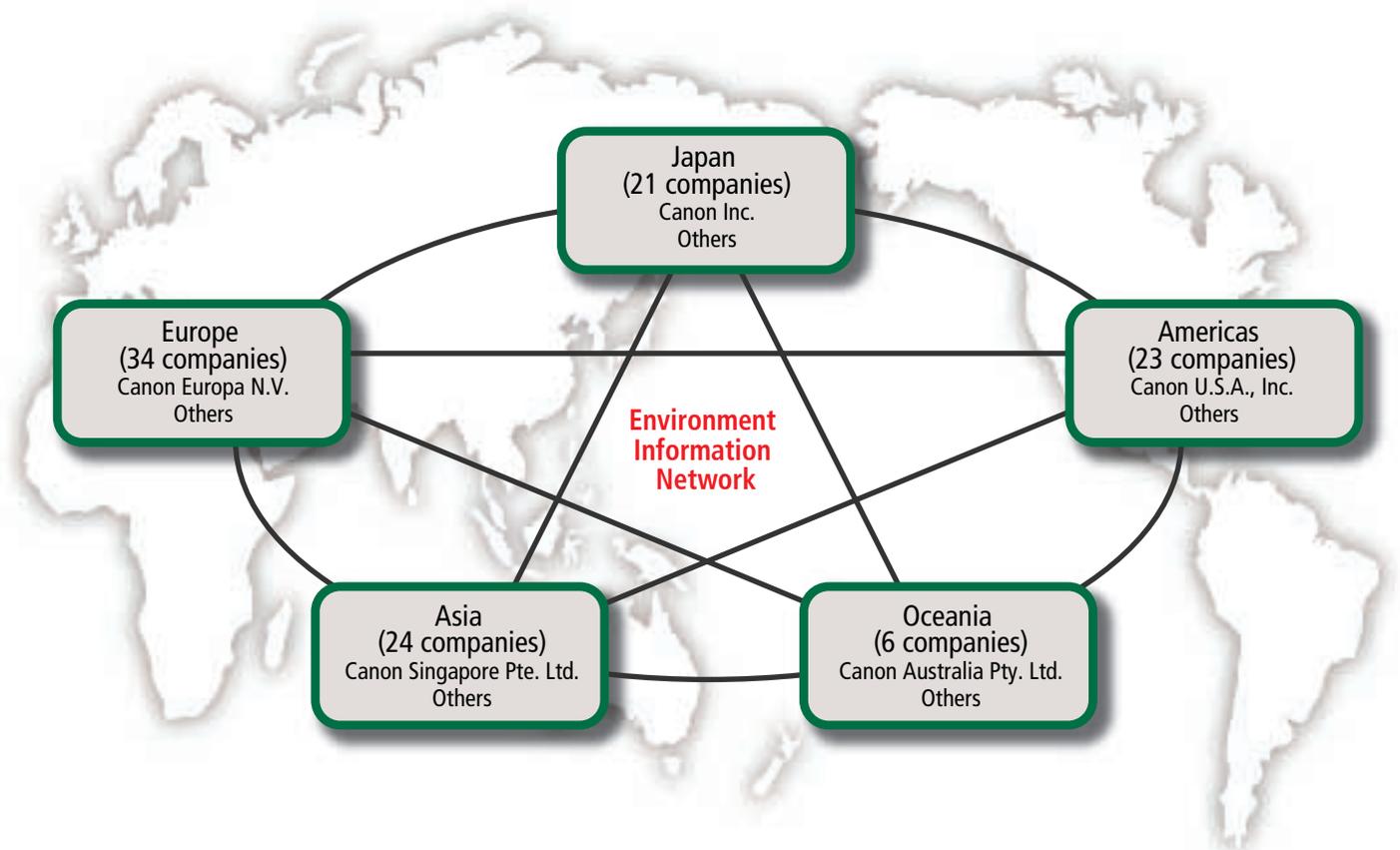
With a diverse organization of global environment assurance and environment promotion committees, Canon is actively integrating environment assurance activities throughout its product development, manufacturing, sales and recycling.



Creating an Environment Information Network to Better Understand and Respond More Quickly to Environment Protection Trends

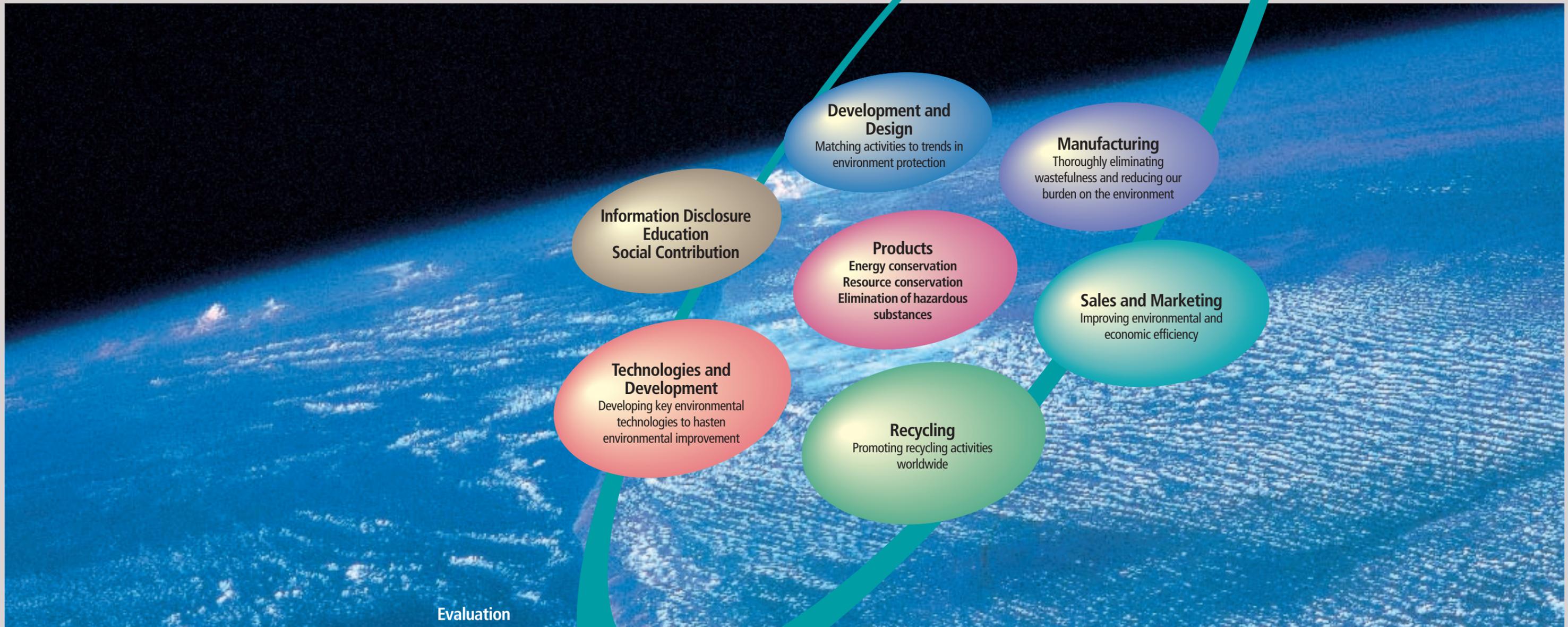
The Global Environment Information Network is an Intranet that connects 26 countries in five regions, promoting environment assurance activities around the world. Using the network, our sites can quickly collect and share environmental information. A total of 108 companies in the Canon Group, including Canon Inc. and affiliated companies around the world, participate in the network, which went on-line in July 1996 to provide environmental information links. We have also assigned dedicated network staff at participating companies to collect information and distribute it via e-mail, ensuring that important data is constantly being circulated globally.

Further reinforcing and upgrading of our information infrastructure will eventually give all Canon Group companies access to information on subjects including chemical substance management, green procurement and industrial waste. This will involve incorporating the vast quantities of information we collect into a database, which will contribute to global environment protection.



Global Environment Assurance Activities

Canon is placing top priority on maximizing resource efficiency, making more effective use of the earth's limited resources. Our global activities focus on three main goals: energy conservation, resource conservation and elimination of hazardous substances in Japan, the Americas, Europe, Asia and Oceania.



Evaluation

Pursuing in-house and third-party assessments at each phase of product life cycles

Working to Incorporate Environmental Considerations in Eco-Product Development by Matching Activities to Environment Protection Trends

To further the development of a recycling society, Canon is working from the planning stage to develop products with a minimal impact on the environment. Our consideration of the environment is evident from the development and design stages through production, sales and recycling. At the same time, information on used products is being collected by sales divisions and fed back to product development divisions, where environmental development and improvement opportunities are examined and implemented.

To achieve the maximization of resource efficiency, we adhere to two environmental principles and eight action items focused on energy conservation, resource conservation and the elimination of hazardous substances.

Canon's Two Principles and Eight Action Items for Environmental Products

<Principles>

To preserve the earth's environment:

1. EQCD policy
2. From product planning through disposal

<Action Items>

1. Strictly comply with the law
2. Conserve energy
3. Conserve resources
4. Facilitate disassembly and collection
5. Facilitate reuse and recycling
6. Minimize final waste after disposal
7. Develop products with long lives
8. Develop products that last in the marketplace

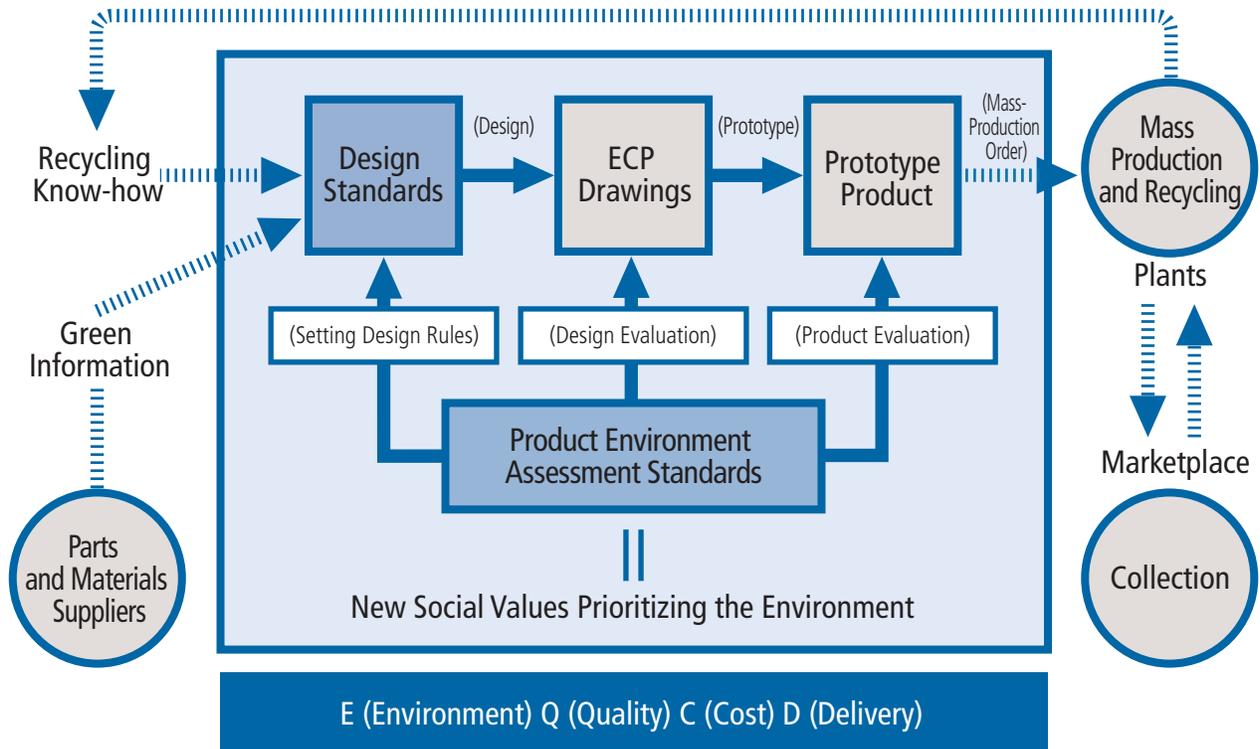
Creating Eco-Design Systems* Centered on Design and Assessment Standards through Entire Product Life Cycles

As the 21st century approaches, people are increasingly concerned about environmental values. In order to use the earth's limited resources more efficiently, Canon's product development and design departments have been seeking to maximize resource efficiency by establishing an eco-design system that is applicable throughout the life cycles of Canon products.

In the field of ECP (environmentally conscious product) design*, "green" (environmental) information from suppliers of parts and materials, design standards based on recycling know-how from the marketplace, and product environment assessment standards that prioritize the environment are important elements.

*Refer to the "Mini-Glossary of Environmental Terms" on page 60.

Eco-Design System



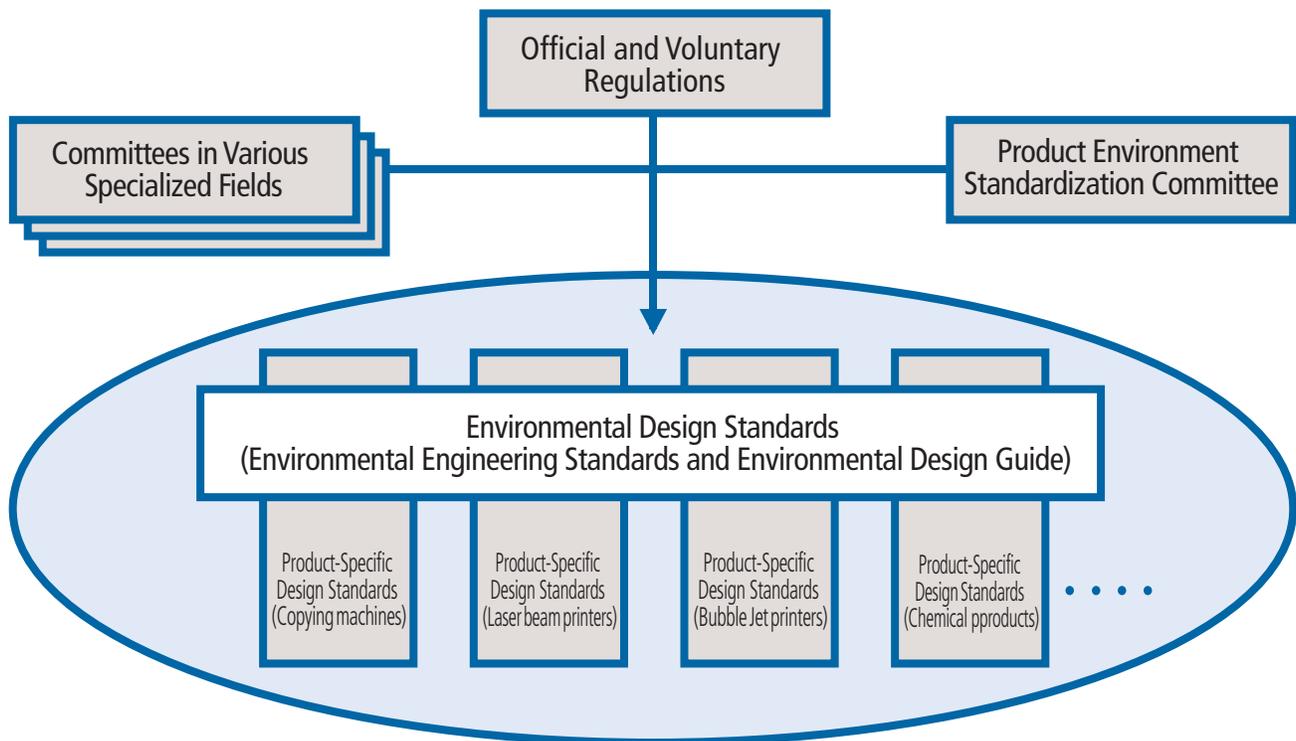
Canon's Product Design Standards* thoroughly Apply Environmental and Product-Specific Design Standards Incorporating Green and Recycling Information

In product design, we have established environmental and product-specific design standards that help us implement our eight environmental action items. These guidelines combine quality, performance and cost information with recycling information from the marketplace and green information from suppliers of parts and materials. In effect, this information becomes a product design tool, helping us to select parts and materials that conserve energy, and resources, and contain no hazardous substances.

We are also working to share this knowledge throughout the Canon Group in order to improve the quality of our environmentally conscious products. To ensure that our design standards lead to the rapid development of new technologies, our Product Environment Standardization Committee and other dedicated committees regularly revise them. At sites where computer-aided design (CAD) systems are used to develop and design products, publications and the Canon Intranet provide our personnel the information they need from any Canon location, 24 hours a day. Applying the most advanced information available, we are working to realize the ideals of ECP design.

*Canon's Product Design Standards are a combination of environmental and product-specific design standards.

Information on Technological Standards for Environmentally Conscious Product Design



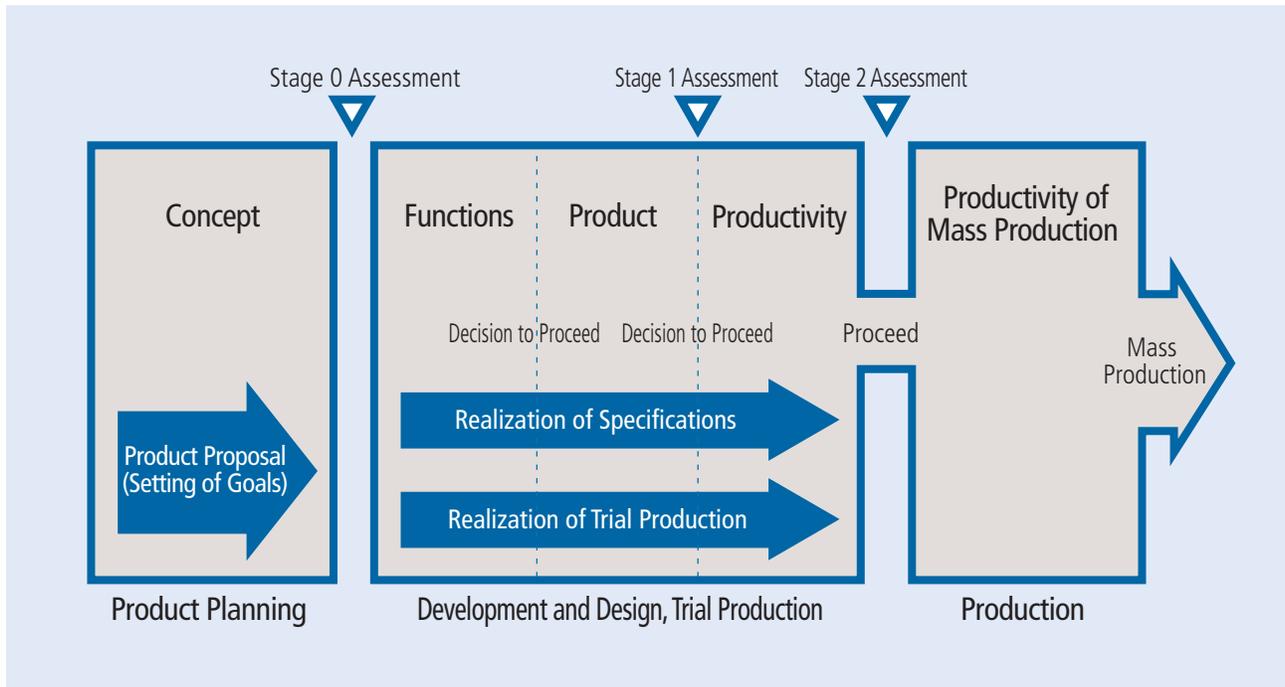
From Product Planning to Mass Production, Canon Implements Three Assessments of Every Product Based on the Concept of Life Cycle Assessment (LCA)*

Canon conducts product environment assessment three times from the planning to the mass production stages. Stage 0 Assessment, during the planning stage, sets a product's environmental objectives. During development, environmental considerations from the environmental design standards are added to these objectives. When the product prototype is completed, Stage 1 Assessment is conducted and the results are incorporated into the production testing stage. Finally, after production has been tested, the product is submitted to Stage 2 Assessment. Only products that clear all of these assessments can proceed to mass production.

By implementing these precise assessments and ECP design, Canon has been able to markedly reduce the number of parts in major products such as copying machines and printers. We have also made great leaps in areas such as shortening disassembly times and raising the recoverability ratio of our products. Moreover, the use of LCA to promote scientific measurement of a product's environmental impact has significantly improved the quality of our new-product decision making.

*Refer to the "Mini-Glossary of Environmental Terms" on page 60.

Three-Stage Product Environment Assessment

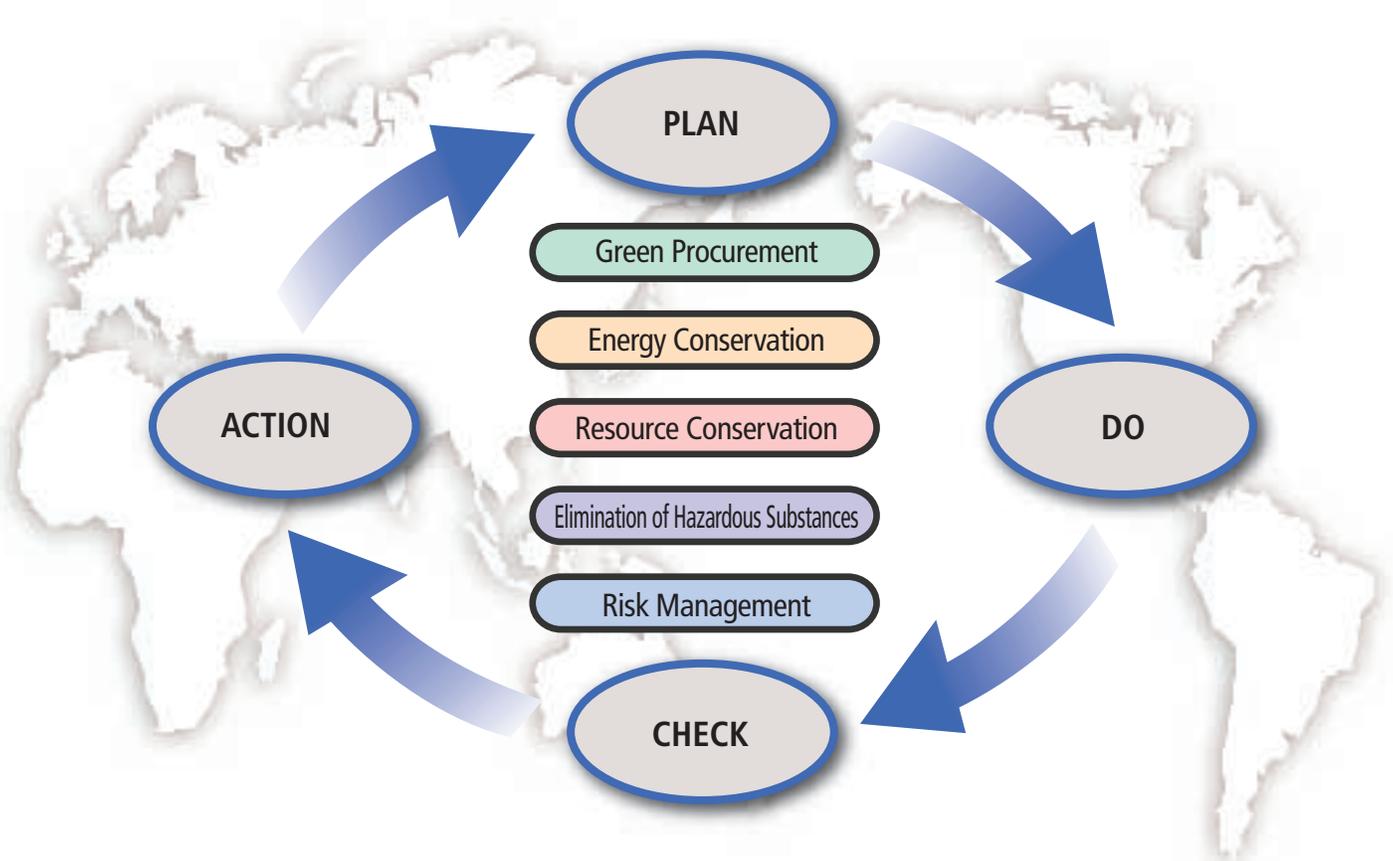


Items assessed: 11 basic and 55 specific

Implementing Worldwide Environmental Management to Eliminate Wastefulness and Reduce Environmental Impact

Canon introduced the Canon Production System (CPS) in 1976 to raise productivity. At the heart of the CPS is the elimination of wastefulness, which also translates into a reduced impact on the environment.

In 1998, the primary focus of CPS was changed to TSS 1/2 (Time & Space Saving 1/2), or reducing the time and space required by production by half. We are now working to improve our environmental efficiency while simultaneously increasing productivity. Each of our production sites takes to heart the principle "plants that fail to protect the environment should not be in operation." We are constantly challenging to maximize resource efficiency in-house and at suppliers of parts and materials. Furthermore, all of our manufacturing facilities are working within the BS 7750/ISO 14001 environmental management standards. We obtained our first ISO 14001 certification in 1995, for facilities at the Ami and Ueno plants in Japan. Since then, we have earned certification at other plants in Japan, the United States and Europe.



Working with Suppliers to Increase Green Procurement

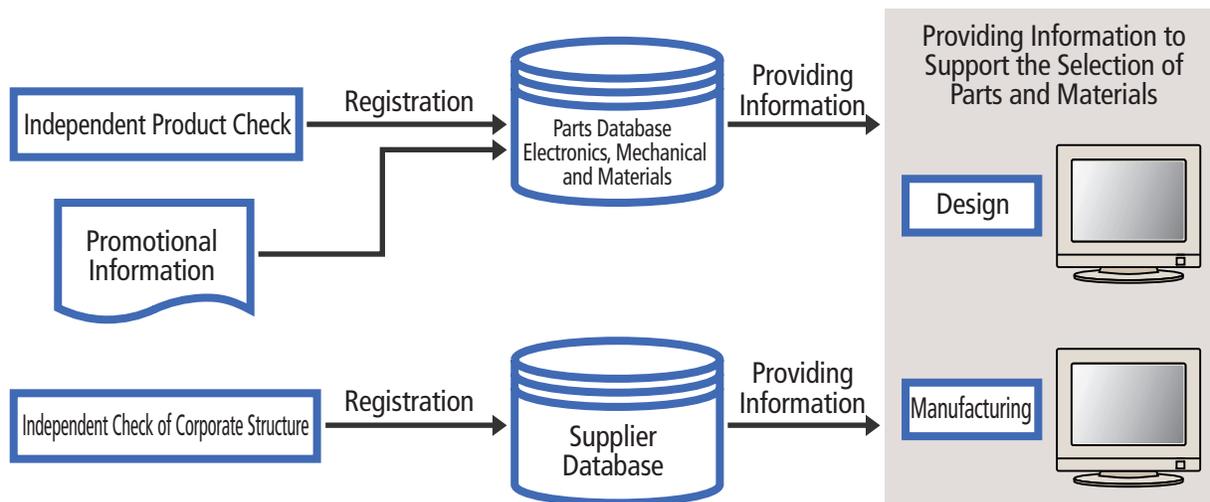
In procurement, Canon works actively with its suppliers to promote environmental preservation. We believe it is important to encourage green procurement activities, purchasing environmentally conscious parts, materials and products that contribute to energy conservation, resource conservation and achieving zero waste.

Full-scale implementation of our Green Procurement Program began in 1997. This included the establishment of a Green Procurement Subcommittee and of principles and standards of green procurement, as well as cooperative activities with suppliers around the world and the creation of an information network. On the theory that "Green products = Corporate supplier structures + Products themselves," we have identified seven supplier parameters. These cover corporate philosophy, planning, organization, systems, evaluation, information disclosure and education. They also include 11 product parameters covering the observance of legal and voluntary regulations, energy and resource conservation, the surrounding environment, chemical substances, recycling, industrial waste, packaging materials, LCA, eco-labeling and information disclosure. We use these parameters to determine the "greenness" of all aspects of prospective components and make procurement decisions accordingly.

Through Environmental Seminars, we seek mutual understanding with our suppliers. To date, these seminars have earned the acceptance of green procurement by approximately 1,100 companies in Japan, 200 in the United States and 200 in Southeast Asia, for a total of some 1,500 companies.

Furthermore, we have completed our examination of approximately 30,000 items of materials and parts from over 400 suppliers. Currently, we are providing the environmental information on resin material to the products development and design departments and a similar information system for parts is being developed.

Green Procurement Management System for Parts and Materials



Designing Buildings to Conserve Energy and Improving Equipment-Usage Efficiency

Canon has challenged energy conservation acknowledging it as the most important issue in Eco-Production theme. In 1999, the Canon Group in Japan used 44% of its energy for air conditioning and heating, 40% for production activities, 10% for lighting and 6% for other purposes. From this base, we have set three objectives for production-related, R&D and management sites throughout the Canon Group. We are now promoting activities that will allow us to reach these goals while taking into account the unique characteristics of operational sites.

For example, at Canon Inc.'s Toride Plant in Japan the environment was an important consideration from the planning stage for a new R&D building. Completed in June 2000, the building is expected to achieve a 40% reduction in energy usage over existing energy consumption standards. Conforming to the Environment and Energy Excellence in Architecture System established by the Institute for Building Energy Conservation in March 1999, the building is one of only five structures in Japan to receive initial certification under the system. The primary reason for this certification is that the architectural specifications for the building take the environment into full consideration. These specifications include infrared-ray-absorbing glass and a water thermal storage system that uses electricity during night hours. Other features include low-energy lighting and a toilet-flushing system that can use rainwater.

To promote energy conservation at Nagahama Canon Inc., we installed electricity-usage meters on major pieces of equipment and analyzed the relationship between energy consumption and equipment usage. We have also introduced ice thermal storage air-conditioning equipment to use electricity during night hours at the Fuji-Susono Research Park.



New R&D building at the Toride Plant



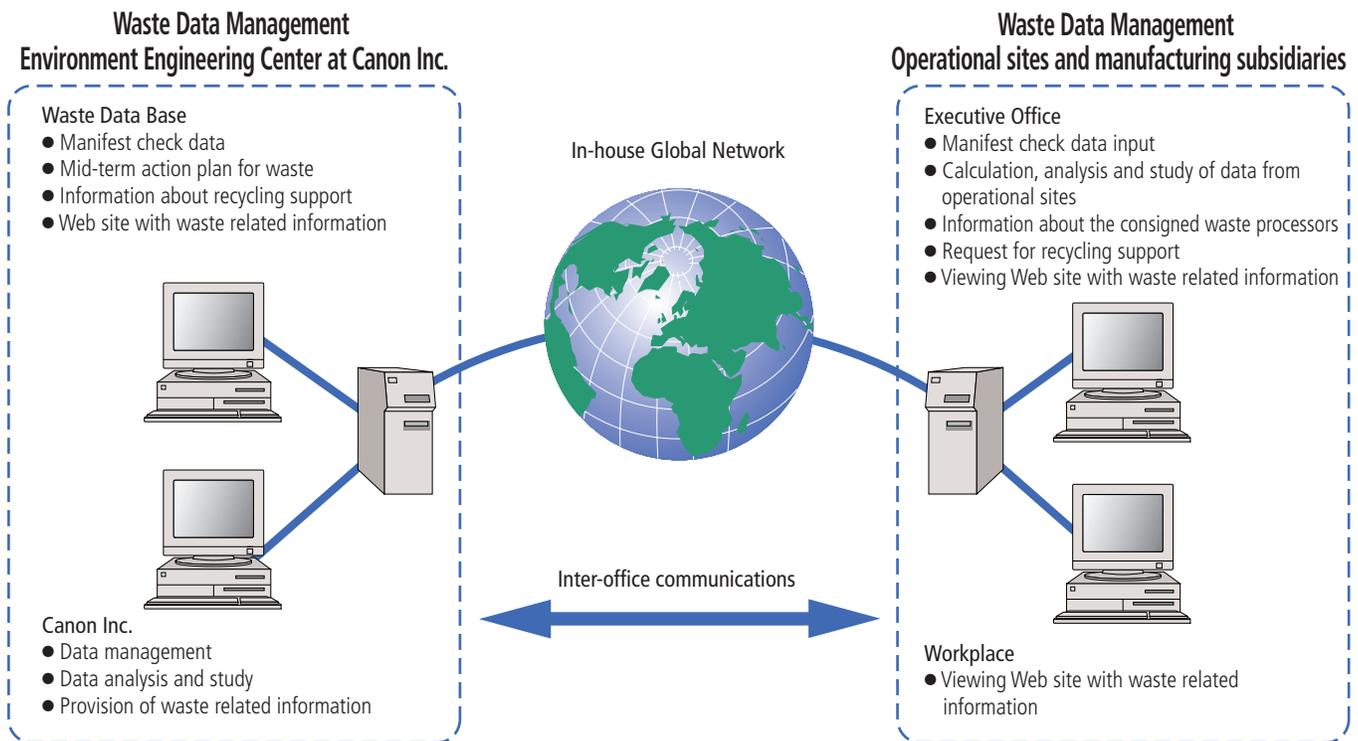
Certificate (above) and logo (right) of the Environment and Energy Excellence in Architecture System

Eliminating Waste by Separating Out and Recovering More than 230 Kinds of Industrial Emissions

Canon considers waste from production processes to be as undesirable as defective products. To eliminate waste, we first work to minimize emissions during production and then reclaim what remains through recycling. After careful analysis at production sites throughout the Canon Group, we have identified more than 230 different kinds of industrial emissions.

Since July 1997, Canon Group have shared the information covering the overall emissions and have controlled the emissions by activating an online data base system that integrates the emission data identified as above-mentioned (manifest check data), information about the consigned waste processors and information related to recycling promotion. Also, we are using the information collected by this system to work on the measures for the reduction of industrial waste and the promotion of recycling.

(Refer to the Environmental Performance Data on Page 49)



Recycling All Water Used in Plants by Complete Water Circulation System

Canon has been striving to achieve a grandiose theme of zero-wastewater from plants. Conserving important living aquatic resources in lower reaches of nearby rivers and living harmoniously with the region is an important factor to select the sites for our plants. To date many of our operational sites have recycled the water used in the production process, however, we need to overcome various obstacles in order to establish a complete closed system which uses the circulation of all the water such as wastewater from the production process and sewage. It requires higher cleansing technology than releasing wastewater into rivers at safe level. At Canon, we have challenged closed drainage system by exploiting a variety of technologies. For example, for cleansing sewage we took advantage of the technology of using a membrane developed in recycling wastewater in lens production, and for the desalination process, technology developed in toner production was used. As a result, Oita Canon Materials Inc. has achieved zero-wastewater. These various water cleansing technologies have also been implemented at our Hiratsuka Development Center, Ami Plant and Ueno Chemical Products Plant, and are contributing to the effective usage of water resources.

(Refer to the Environmental Performance Data on Page 49)



Oita Canon Materials Inc. worked with a variety of technologies to achieve zero wastewater.

Working to Eliminate, Reduce and Control the Discharge of Hazardous Substances

Management of Chemicals

Canon uses some 9,000 kinds of chemicals in its production, each of which is identified with a registration number and carefully managed with due consideration of its environmental impact. When new and unregistered chemicals are considered for use, Canon Inc. deliberates with regional committees. Only substances that are certified through this process are assigned registration numbers and approved for use.

In the summer of 1997, we created an online database system to handle information retrieval and applications for new substance approval. This system has simplified chemical management, making it easy to check on the status of specific chemicals, inventories at individual operational sites and amounts being used. We have also made it possible to confirm our Material Safety Data Sheets (MSDS)* at in-house computer terminals to sustain the timely and appropriate management of the chemicals we use.

Eliminating Hazardous Substances

As of the end of 1997, Canon had eliminated the use of such chlorinated organic solvents as trichloroethylene (TCE), tetrachloroethylene (C₂Cl₄) and dichloromethane (CH₂Cl₂), which were used to clean metals, from all but a few of its manufacturing process. In addition, we have created a list of approximately 2,000 substances that are harmful to health and the environment, classifying them with the emission goal-rankings A (Eliminate), B (Reduce) and C (Control Discharge). We have also developed systems to effectively manage these substances in line with Pollutant Release and Transfer Registers (PRTRs)*.

We have already established internal regulation standards that surpass all legal regulations and are currently developing alternative technologies in a consistent, Groupwide movement to deal with hazardous substances throughout our production activities.

*Refer to the "Mini-Glossary of Environmental Terms" on page 60.

(Refer to the Environmental Performance Data on Page 50 to 52)

Data Processing for Chemicals

Canon Inc. Environment Engineering Center

Chemical Substance Database
MSDS Database
Database of Substances in Use at Workplaces



- Registration number issuance
- Registration data
- MSDS registration
- Groupwide management of substances in use by the Canon Group



Regional Committees

- Management of substances in use at operational sites
- MSDS data retrieval
- Registered chemical data retrieval



Workplaces

- Applications for chemical use and chemical data retrieval
- Input of amounts used
- Registered chemical data retrieval
- MSDS data retrieval



Promoting Independent Environmental Preservation Activities to Prevent Pollution before it Occurs

Environmental Auditing

Since 1994, Canon Group operational sites have pursued environment assurance through our own Production Environment Assurance Standards, which are also in line with ISO standards. To independently reinforce this assurance process, we have internal auditing programs run by auditors of the head office environment department and by auditors stationed at individual operational sites.

Environmental Analysis and Measurement

To meet the requirements of Japan's Measurement Law and Working Environment Measurement Law, Canon has established a system incorporating an Environmental Measurement risk legal requirements in Japan, Canon has established a system incorporating an Environmental Measurement Certifier and Working Environment Measurement Organization. To fully understand the environmental status of each Canon operational site, we have also established a system that independently sets the frequency and management of measurement activities. Using state-of-the-art equipment, Canon personnel with environmental Certified Public Measures and Working Environment Measurement credentials measure and analyze our activities, facilitating speedy responses when required.



Environmental analysis and measurement facility

Prevention and Preservation

Our Production Environment Assurance Standards call for a variety of preventive measures to reduce environmental impact throughout our business activities, from production processes to equipment to buildings and other structures. When new equipment is introduced, we always ensure that it incorporates appropriate pollution-prevention measures. Specific prevention and preservation recommendations include encouraging the placement of equipment so that it can be inspected from all sides and eliminating the use of underground installations.



Wastewater inspection equipment

Risk Management

Rules have been established in the environmental management guidelines of our operational sites to deal with unpredictable cases when the environment is unavoidably affected. For example, these rules specifically define procedures to speedily and reliably limit the environmental impact of fires, earthquakes, floods and power outages, preventing their expansion and aiding the recovery from any damage. These rules include instructions on handling information during such events.

(Refer to the Environmental Performance Data on Page 53)

Pursuing CO₂ Reduction and Eco-Distribution Activities to Improve Environmental and Economic Efficiency

Shortening Routes between Plants and Export Ports

Previously, products manufactured at Hirosaki Sieki, Inc., a subsidiary of Canon Precision Inc., were sent by truck from Japan's northern Tohoku region to a distribution center in the Kanto region, where they were packaged in containers for export from the Port of Tokyo. In 1997, however, we established a regional distribution center in Tohoku, allowing us to optimize this distribution route by handling container packaging and export directly from the Port of Sendai, which is also located in Tohoku. As a result of this move, we were able to ship approximately 3,200 containers in 1999 and reduce the distance traveled by trucks by about 1,280,000 kilometers.

At Canon Inc.'s Ami Plant, we have pursued an even more revolutionary system for the past several years: packaging products in containers on-site and shipping them directly to the Port of Tokyo. Toride and Ami plants and other Canon Group companies such as Nagahama Canon, Inc., Coyer Co., Ltd. and Canon Electronics Inc. are also using this system. In 1999, these sites filled more than 3,900 containers on-site.

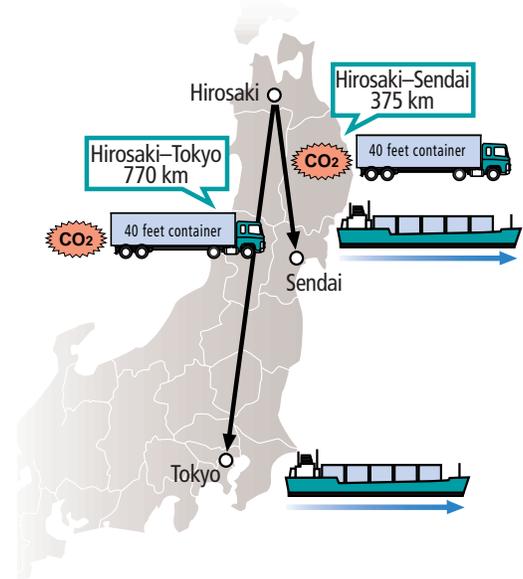
Programs such as these have helped Canon greatly reduce shipping distances, contributing to the prevention of global warming by reducing CO₂ emissions and conserving energy. Efficiency has also increased because of reduced inventories.

Establishment and Operation of an Exchange Center for Collected Copying Machines (Tokyo)

With the idea that manufacturers should recycle their products, Canon has taken a leading role in the establishment of an exchange center for collected copying machines, a facility designed to support efficient, industrywide return to manufacturers of copying machines that are traded in for new products from different manufacturers. This center, managed primarily by the Japan Business Machine Makers Association (JBMA), began full-scale operations in the Tokyo metropolitan area in May 1999 with the cooperation of Canon and other manufacturers in the industry. In 1999, including the trial period from January, the total number of the copying machines that were returned to their manufacturers was 10,398. A sizable increase in numbers is expected in 2000 due to the fact that the Tokyo center started to cover the whole Kanto Region and a new center was established in the Kinki Region.

(Manufacturers participating in the Exchange Center: Canon, FujiXerox, Konica, KyoseraMita, Matsushita, Minolta, Ricoh, Sharp and Toshiba)

Distribution Route Reduction



With a Tri-Region Organization, We Are Promoting Recycling on a Global Level, Remanufacturing of Used Canon Products and Reuse of Parts

Canon believes that sales and recycling activities should be pursued with the active cooperation of our customers. We are therefore promoting recycling activities around the world with a focus on methods that have minimal environmental impact and are matched to the needs of society and customers.

Canon's view of product life cycles begins from the planning stage, and we are undertaking a range of recycling activities for everything from individual parts to packaging materials. In our sales operations, we are working to raise environmental efficiency from product shipping to the collection of used products.

In recycling, we place the highest priority on product remanufacturing, then on part reuse, on material recycling and finally on thermal recycling. We have organized a tri-region structure that pursues these priorities on a global scale. We are also promoting the development of technologies and products that will raise our recycling levels, improve resource efficiency and eliminate waste.

Canon also applies the same quality and safety standards to remanufactured products and reused parts as it does to brand-new parts.

Tri-Region Recycling Organization (Recycling Bases)



Remanufacturing to the Same Standards as New Products—Part of Canon’s Product Recycling Programs for Environmental and Economic Efficiency

Canon’s copying machine remanufacturing* activities are global in scale and quality-focused. In fact, remanufactured machines are on a par with similar-capability new copying machines.

We began remanufacturing copying machines at Canon Virginia in the United States in 1992. During the following year we initiated a similar program at our primary European site, Canon Manufacturing U.K. To expand remanufacturing in North America we established Custom Integrated Technology, a subsidiary of Canon Virginia, in 1995. Later, in 1998, we began remanufacturing copying machines in Japan at the Kofu Plant of Coper Co., and in 1999 transferred our European activities from Canon Manufacturing U.K. to Canon Giessen in Germany.

Copying machine remanufacturing begins by disassembling collected machines into their constituent parts. We then perform rigorous inspections of the separate parts, reusing only those that pass our screening and replacing worn parts with new ones. The result is a high-quality remanufactured machine. In 1998, Canon remanufactured 3,000 copying machines in the United States and 2,400 in Europe, all of which were delivered to customers around the world.

*Refer to the “Mini-Glossary of Environmental Terms” on page 60.
(Refer to the Environmental Performance Data on Page 54)



Canon Manufacturing U.K.



Custom Integrated Technology



The Kofu Plant of Coper Co., Ltd.

Worldwide Collection of Toner Cartridges for Recycling

The toner cartridges used in personal copying machines, laser beam printers and facsimile machines are an essential part of office and home information-processing equipment across the world. Since Canon began supplying these cartridges in 1982, we have earned a reputation for easy maintenance, high reliability and excellent overall imaging quality. Canon was also one of the first companies in the industry to reduce the load that toner cartridges place on the environment. In 1990, we began our global toner cartridge collection and recycling program, which is now operating in 21 countries throughout the Americas and Europe, in addition to Japan.

Toner cartridges that we collect from these regions are shipped to three locations for disassembling and recycling: Industrial Resource Technologies, a subsidiary of Canon Virginia in the United States, Canon Bretagne in France and Canon Dalian Business Machines in the People's Republic of China.

One of the most important aspects of our recycling activities is our level of attention to quality. Cartridges collected by each facility are disassembled and parts that can be reused are removed. Parts destined for reuse are cleaned and subjected to the same stringent quality assurance checks as new parts before they are used on the assembly line.

Our second approach to recycling is to consider environmental impact throughout the entire product life cycle. For example, when parts cannot be reused as is, we are working actively to use these parts as materials in other applications.

(Refer to the Environmental Performance Data on Page 54)



Canon Dalian Business Machines



Industrial Resource Technologies



Canon Bretagne

Bubble Jet Ink Cartridges Parts—More than 97% Recoverable

In 1996, out of concern for the environmental impact of Bubble Jet ink cartridges, began placing collection boxes at Canon Zero One shops (Canon Sales retail outlets) and service centers throughout Japan. This approach was designed to collect the used Bubble Jet ink cartridges with the active cooperation of our customers. Including general volume retailers, the number of shops participating in the collection has reached well over 2,000 across the country in 2000.

The cartridges collected in this way are then brought to the Canon Recycle Operation Center (CROC) at Nippon Typewriter Co., Ltd., located in the city of Iwai, in Ibaraki Prefecture. Here the cartridges are separated into material groups for reusing as plastic or metal parts. The specialty resins used with the cartridge ink tanks are reused as a part of cartridge materials, which enables closed recycling. Additional resins, metals and other materials are also recycled and put to other uses. In 1998, we began using some of these materials as a reducing agent for blast furnaces—an alternative to coke—further increasing the percentage of cartridge that are recycled. As a result, the recoverability ratio exceeds 97% by weight.

(Refer to the Environmental Performance Data on Page 54)



Automatic disassembly of Bubble Jet ink cartridges (CROC)



Resin washing and drying equipment (CROC)

Reducing Polystyrene Packaging and Promoting Closed Recycling

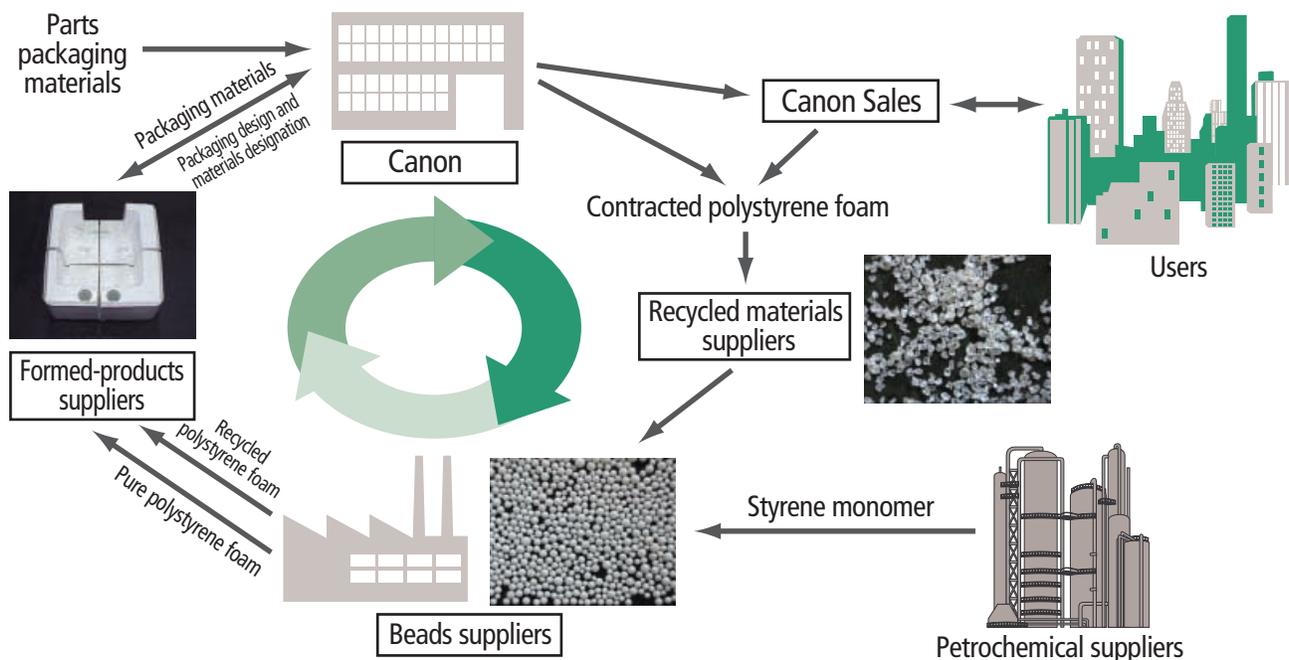
Canon is extremely conscious of the environmental impact of the materials it uses in packaging the products delivered to its customers. Instead of wooden pallets, we have begun placing products on cardboard pallets. In place of polystyrene foam, we have begun using pulp molds to package smaller products, and many of the protective stretch films that we use for packaging are now recyclable.

Canon began phasing out its use of polystyrene foam at the end of 1991. By 1997, we had halved our use of this material, compared with 1990. At the end of 1997, Canon also mounted a Groupwide initiative to encourage the closed recycling of polystyrene foam, and this recycling began in May 1998 and over 200 tons were recycled in 1999.

The recycling system calls for the collection of polystyrene foam used by all Canon Group and affiliated companies throughout Japan. This foam is then melted and reformed into reusable beads that can be used to pack other Canon products. Packaging materials that incorporate these reused beads have the same cushioning properties as the original polystyrene foam.

(Refer to the Environmental Performance Data on Page 55)

Closed Recycling of Polystyrene Foam



In July 1999, the Japan Packing Institute presented Canon Inc. with the Electric Equipment Packing Category Award for its closed recycling system for polystyrene foam.

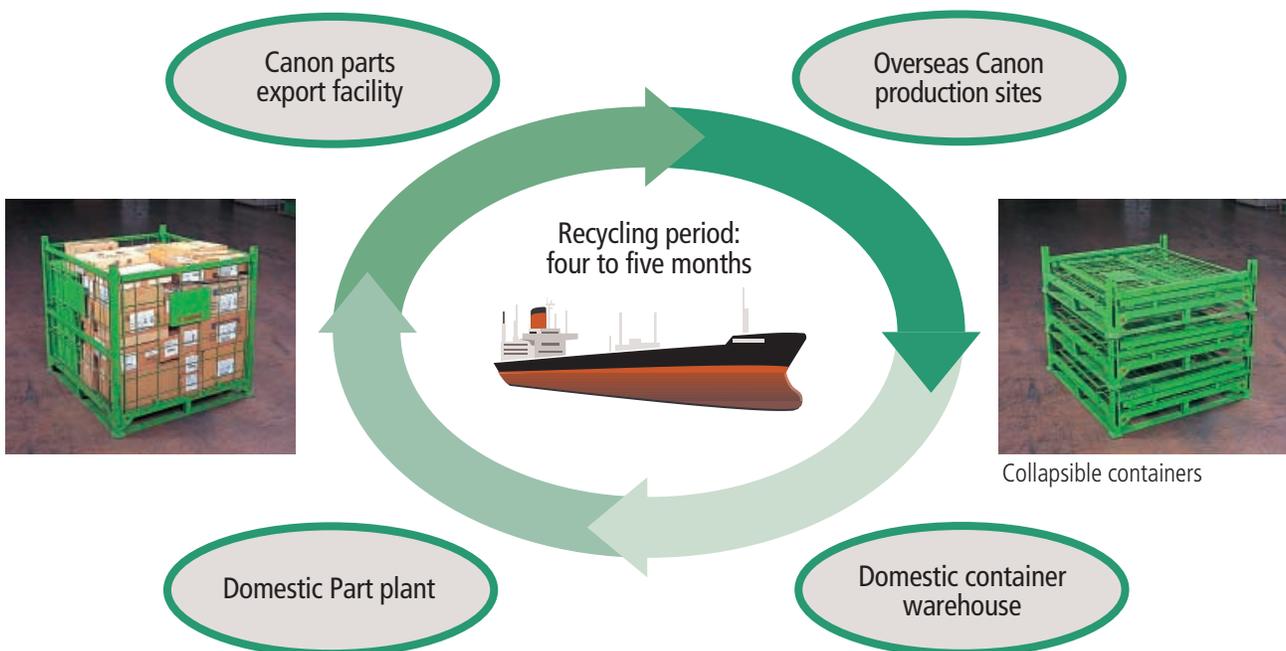
Reducing Environmental Impact and Costs Internationally through Returnable Boxes

Canon provides a wide range of key parts from Japan to its overseas manufacturing site in the Americas, Europe and Asia. By reusing the materials used when these parts are packaged for export – including cardboard boxes, plastic containers, shock-absorbing materials and dividers – we have greatly reduced the load that Canon’s distribution activities place on the environment.

In the past, materials that were used to package parts destined for export were considered disposable. Today, however, Canon is actively working to standardize the sizes and types of materials used in such packaging. We are also encouraging the use of foldable reinforced cardboard and collapsible steel containers and trying to reduce the volume of plastic container accumulation, thereby minimize the cost of shipping such materials back to Japan. As a result of these efforts, we reduced the amount of plastic containers that hold parts used in toner cartridge production by a total of 531 tons in 1998 and 436 tons in 1999. These efforts have also substantially decreased the levels of waste in countries that import these parts.

Also, we have standardized the size and material of the pallets used for importing parts from overseas. The new cardboard pallets currently being used are recycled for domestic and overseas use and they also serve best for “wooden pallet control” in China.

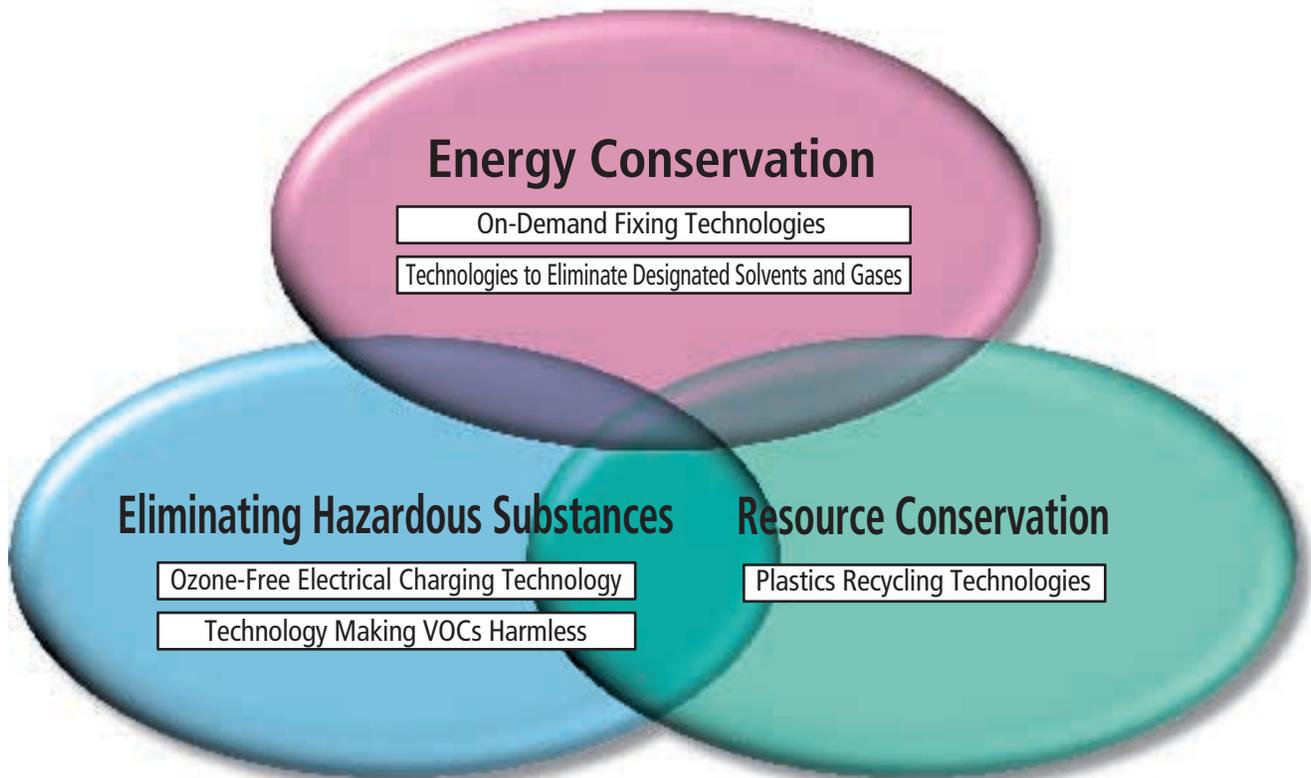
International Returnable Box System



Environmental Improvement through Independent Development of Key Environmental Technologies

Canon is committed to developing eco-technologies that help conserve energy and resources, as well as eliminate hazardous substances. Through these efforts, we are minimizing the environmental impact of Canon products throughout their product life cycles. Our priorities are to reduce the energy that products use, to ensure zero emissions of hazardous substances in office environments and to eliminate hazardous substances so as to raise safety levels during product disposal. Canon is also realizing resource conservation by developing recycling technologies, and smaller and lighter products.

Furthermore, as some of the specialized solvents and gases used in manufacturing processes can contribute to global warming, Canon is developing technologies to eliminate or minimize the use of such materials in production processes.



Taking the Lead in Conserving Energy

Canon's originally developed on-demand fixing technologies address two issues that have in the past posed seemingly insurmountable challenges in the application of toner to paper: conserving energy and eliminating lengthy warm-up times. Conventional heated-roller fixing uses heat inefficiently because the halogen heater has to keep the roller warm in standby mode, unless the user is willing to accept warm-up times of up to one minute. By contrast, Canon's on-demand fixing technologies achieve vastly improved heat transfer efficiency and lower heat capacity requirements with a thin fixing film and a ceramic heater. With this revolutionary technology, heat is applied only when paper passes through the fixing mechanism, and the image is fixed via the fixing film. (See Figure 1.) Consequently, energy consumption is reduced to one-fourth of the conventional level, without causing long warm-up times (see Figure 2).

Canon offers a full lineup of laser beam printers, copying and facsimile machines and multifunctional peripherals that use on-demand fixing, with output ranging from A4- to A3-size paper.

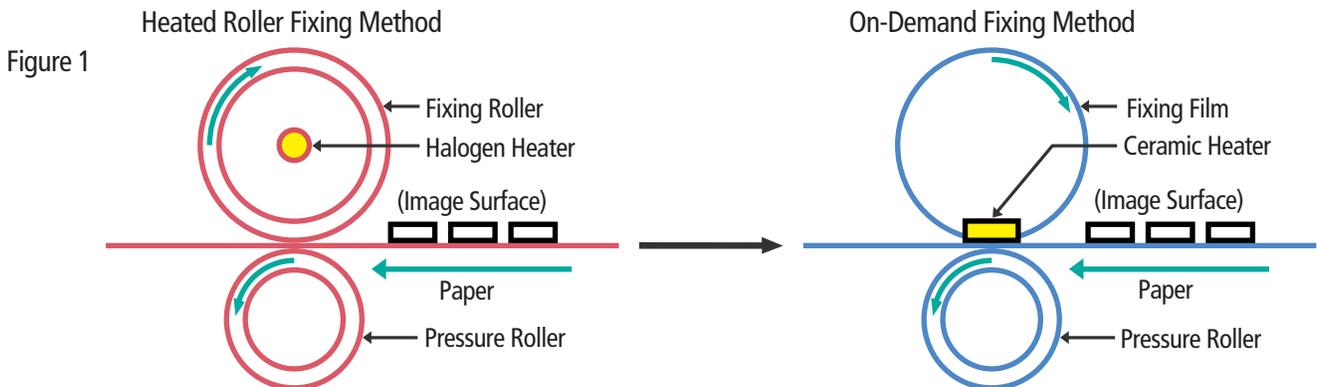
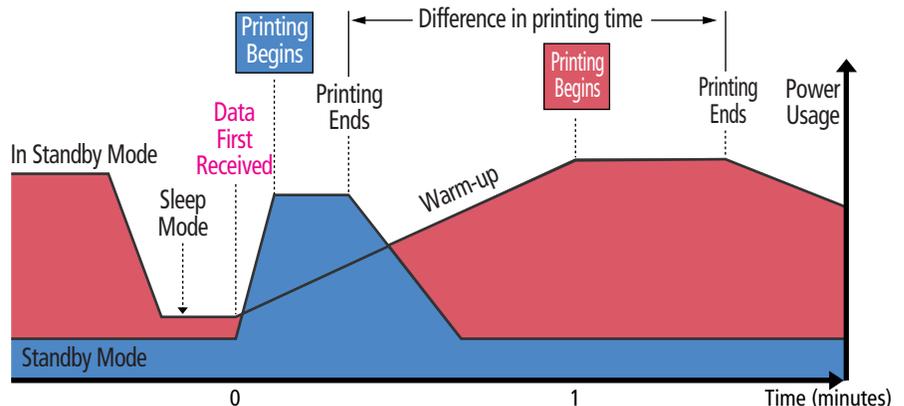


Figure 2
Canon's LBP-840 laser beam printer automatically goes into standby mode only nine seconds after power is supplied. There is no warm-up time between this mode and the start of printing. On average, LBP-840 printers use only 17 W per day in standby mode, and its CO₂ emission is also substantially reduced.



Note: This is a comparison of the LBP-830 and LBP-840 printers outputting one page per 10 minutes, or 42 pages in seven hours.

Completing Elimination of Gases that Increase Global Warming

Canon has completed the elimination of the three kinds of gases (PFCs, HFCs, SF₆) from the production process in accordance with the decision made at the Third Conference of the Parties (COP3) in Kyoto in 1997. These gases are said to have thousands to tens of thousands of times the greenhouse effect compared to that of CO₂.

PFCs which took up about 70% of the special coating solvent used for the toner cartridge was replaced by hydrofluoroethers (HFE) which has a lower greenhouse effect. Also, we have terminated the use of HFCs as aerosol propellant in the spray system by switching to a system using compressed air.

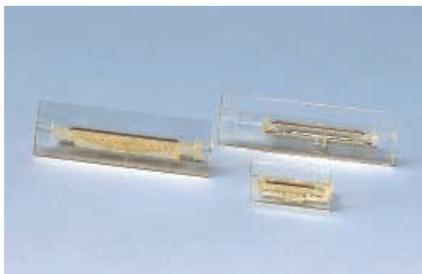
Since we have not found an effective replacement for PFCs which are used in the production and cleansing of semi-conductors, we will continue to seek a solution. We are also considering the termination in the future of the use of HFE that replaced PFCs by implementing other systems such as a powder coating system in which no solvents will be necessary.

PFCs: perfluorocarbons

HFCs: hydrofluorocarbons

(Refer to the Environmental Performance Data on Page 48)

By the end of December 1999, we had completed the conversion of the non-energy special solvents and gases, used for the production of the parts shown below, to substances that have smaller effect on global warming.



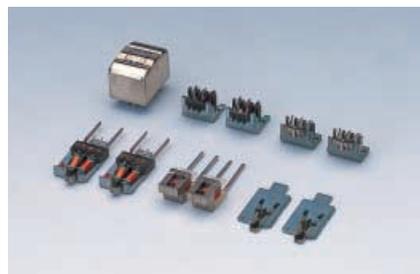
Bubble Jet printing head parts



Cleaning and developing blades for toner cartridges



Toric lenses



Magnetic heads

Challenging New Technology Development Sandwich Used Plastic with Virgin Material

Almost all housing material of business machines is made of plastic. Generally, plastic deteriorates during the usage, such as yellowing by ultra-violet light, loss of strength and flame resistance by hydrolysis. Therefore, it is not easy to maintain the same quality in recycling plastic.

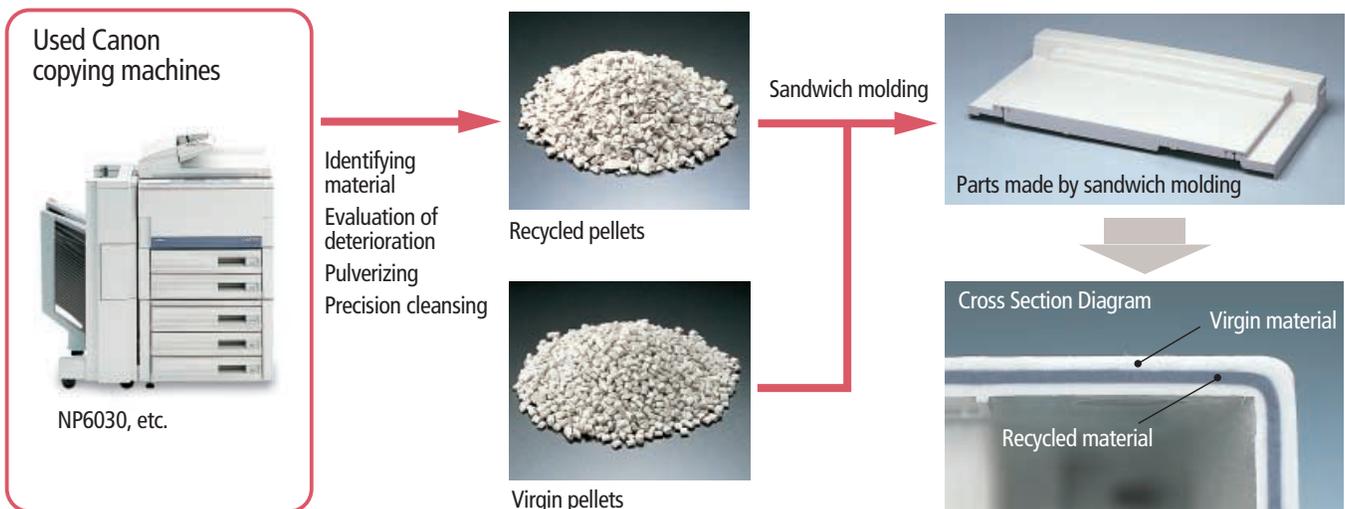
Other than using the method of mixing virgin pellets with recycled pellets to recover solid state properties, we have developed the technology of sandwich molding. By putting recycled material between virgin material, the recycled material gets contained inside and does not come out of even thin materials and uniformly fills all materials. This method has two advantages:

1. Since virgin material is used for the surface, used material does not affect the outer look of the products.
2. Mixing and toning of used materials not required, and the strength and flame resistance of the used material will not decrease because it is not heated in the process.

The parts made in this method have achieved a 30% containment of used material and cleared the strict flame resistance standard (UL 94-5 VB).

In 2000, we will start selling copying machines using housing material made from the sandwich molding technology. Also, we are planning to use the method widely for other products such as laser beam printers, Bubble Jet printers and facsimiles.

Plastic Recycling System

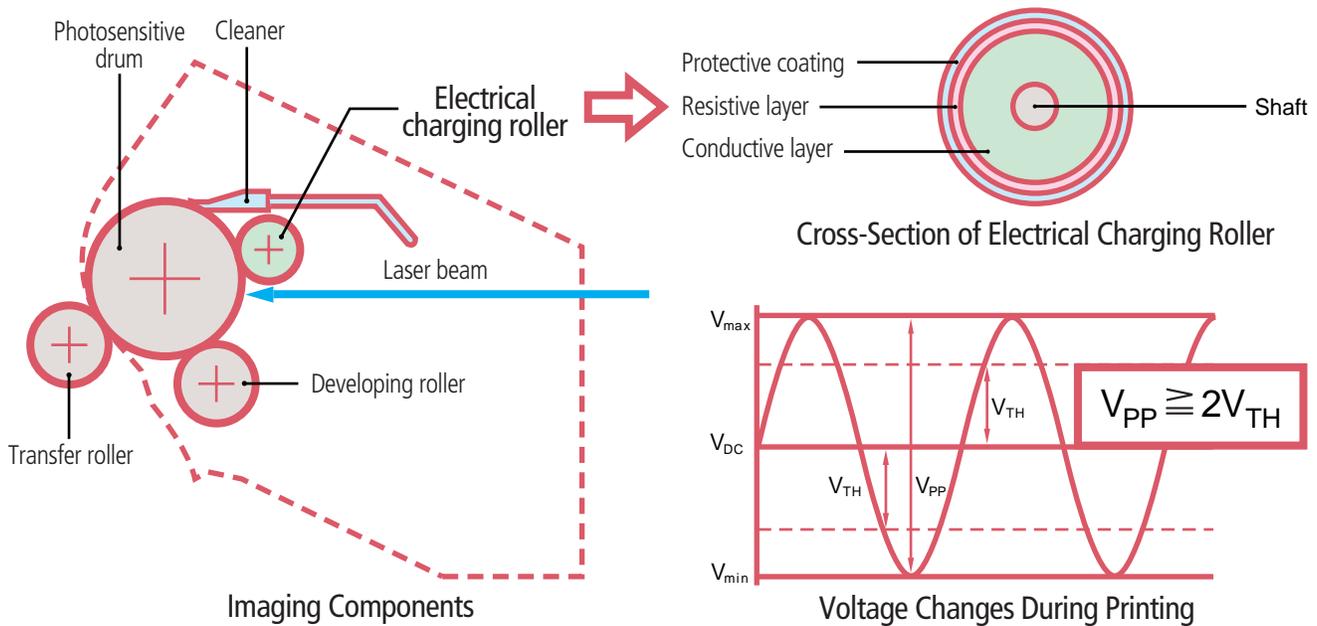


Contributing to Clean Office Environments with Technologies to Minimize Ozone Emissions from Office Equipment

Conventional laser beam printers, copying and facsimile machines typically use a Corona electrical charging system, which electrifies a photosensitive drum. The Corona system typically involves voltages of between 5,000 and 10,000 volts, and produces ozone. Ozone absorption filters with complicated internal designs and airflows have to be fitted to these machines to prevent ozone emissions. However, Canon has developed a new roller charging method that superimposes alternating current and direct current waveforms in the conducting roller. Compared with the Corona electrical charging system, this method reduces ozone production to only 1/1,000th of conventional levels while cutting the reference voltage to one-fifth of the former level.

In 1989, Canon unveiled its ultracompact LBP-LX laser beam printer—the world’s first commercial device to use this new technology. Because of its lower reference voltage and lack of ozone absorption filters—which facilitates streamlined airflow—this printer was simpler than conventional models. A substantial reduction in the number of components also simplifies maintenance, making this printer suitable for personal use. Since its introduction, this printer has earned a solid reputation for its contribution to energy and resource conservation, as well as to cleaner office environments.

Ozone-Free Electrical Charging Technology



Note: In June 1999, Canon won the Prize of the Commissioner of the Japanese Patent Office and Invention Practice Service Prize for its ozone-free electrical charging technology. The awards were announced at the Prize of the Commissioner of the Japanese Patent Office ceremony hosted by the Japan Institute of Invention and Innovation.

Developing Technology Making VOCs Harmless to Stop Emission of Hazardous Substance into Air

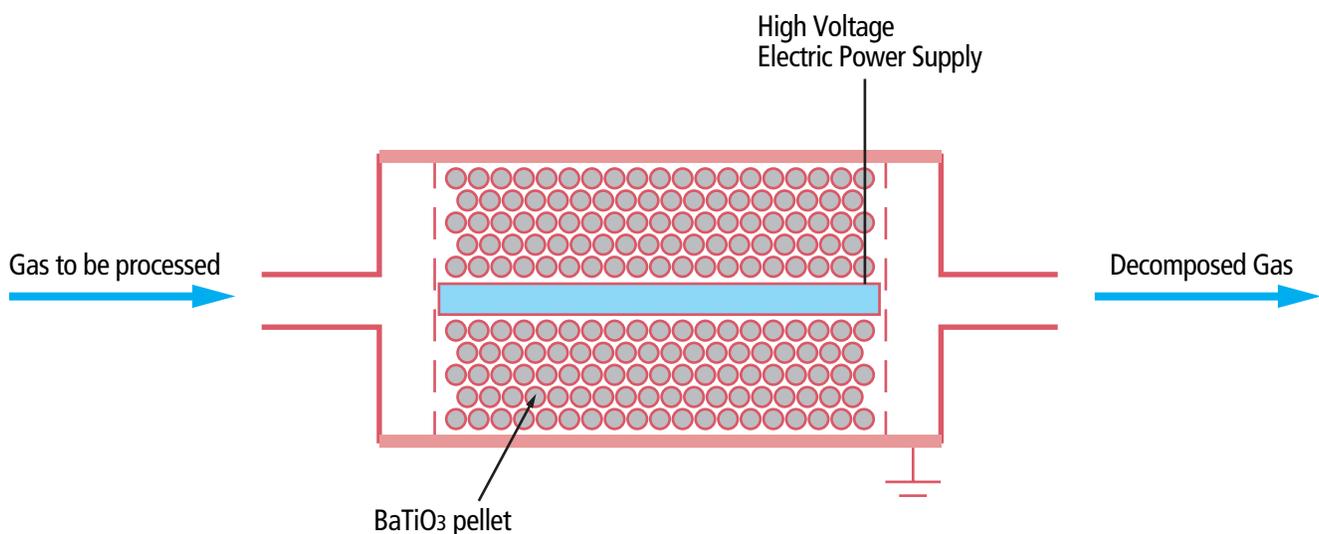
In March 2000, PRTR (Pollutant Release and Transfer Register) was enacted and control and emission of environmental hazardous substances has become more restricted than ever. At Canon, we used approximately 100 kinds of chemical substances in the production process in 1999, and have been working toward emission control, usage reduction, and defusing.

Currently, various technology making VOCs harmless, such as photolysis, biolysis, catalysis, thermal, and plasma technology are being considered. We have begun to examine non-thermal plasma technology which is thought to be the easiest and has the highest decomposition efficiency. VOCs such as methanol, toluene, xylene and methylethylketone which are all gasifiable can be decomposed completely by impressed voltage of some kV and made into carbon dioxide and water. As a consideration factor of non-thermal plasma technology, we have been studying reactor vessels, characteristics of ferroelectric and the kinds of VOCs and so forth. For steps towards the practical application, we are planning to establish technology to decompose by-product material, increase decomposed quantity and confirm the effectiveness on pilot lines at actual plants.

Moreover, plans are being made to develop a smaller decomposing VOCs device.

* VOCs: Volatile Organic Compounds

VOCs Defuse Test System



Canon Cameras and the Environment

Lead was once present in half of the approximately 200 types of optical glass used in lenses, because it raises the degree of refraction. The lead is fixed in the glass, so there is no danger of it escaping during use, but glass sludge waste, a by-product of lens production, also contains lead and can be environmentally hazardous.

Avoiding lead altogether is the ideal way to reduce the amount of lead given off during processing. Canon began tackling this problem in 1991, when we joined glass manufacturers in an effort to jointly develop different types of lead-free glass. As a result, we found that environmentally stable titanium could be used in place of lead without sacrificing optical characteristics.

As of 2000, Canon uses approximately 100 types of lead-free glass. The photographic lenses of Canon's lens-shutter cameras are now 100% lead-free, as are our EF lenses for EOS series SLR cameras (with the exception of a few types of specialty lens). By using lead-free glass and plastic, we have also nearly eliminated the use of lead in viewfinders. Our work on small-diameter lenses and new forming processes should decrease the level of lead waste still further. Outside of Japan, Canon produces cameras in Taiwan, Malaysia and the PRC, and nearly all of the glass used in cameras made at these sites is lead-free.

We are also moving toward more environmentally conscious camera bodies and external parts by increasing the use of aluminum, stainless steel and other metals. The result is higher-quality products that are more recyclable. Canon is also reducing the amount of parts used in cameras, making them more compact and lighter.

Additionally, Canon was one of the first companies in the industry to adopt the Advanced Photo System, which allows developed negatives to be stored in the original film cartridge. This system cuts down substantially on film cartridge disposal.



IXY320/ELPH2/IXUS II



EF lens series

Eco-Technologies Improving Office Environments

Canon is actively applying its environmental expertise, from eco-technologies and on-demand fixing to ozone-free electrical charging, to its line of copying machines. Even the development of these machines is based on environmentally conscious specifications in the form of environmental product policies:

1. Energy-conserving designs control CO₂ emissions
2. Easy-recycling designs help promote recycling consciousness
3. Clean-operation designs help promote environmental protection

Thanks to recent rapid progress in digital networking technology, we have also been able to add new document management and processing functions, developing application technologies that add capabilities to our copying machines. In these and other ways, we are actively creating user-friendly offices, comprehensively improving every aspect of the environment with our products.

Furthermore, we have been promoting a "remanufacturing program" in which products made redundant by users are collected and remade in equal quality as new products, a "reusing program" in which disassembled parts are recycled and reused for new products, and a "recycling program" in which unusable parts are disassembled and separated to be recycled and the materials reused.



GP605/ImageRUNNER 600



GP405 series/imageRUNNER 400S

Creating Printers that Are Environmentally Conscious

Promoting Energy-Saving Printers

On average, printers output only about 40 pages a day during normal operating conditions, meaning that they are in standby mode most of the time. Canon was the first company in the industry to focus on this fact, which led to the development and incorporation in laser beam printers of technologies such as on-demand fixing (see page 33). Because this technology removes the need for printer warm-up time, even high-performance machines such as the LBP-910, a high-speed model that can output A4-size paper at 22 ppm (maximum up to A3), use an average of only 14 W per day in standby mode, about a quarter of the consumption of earlier printers. This also allows our printers to meet the targets of the international ENERGY STAR® office equipment program while contributing to CO₂ emission reduction. Canon is currently expanding its lineup of on-demand products, actively developing products that are environmentally conscious.

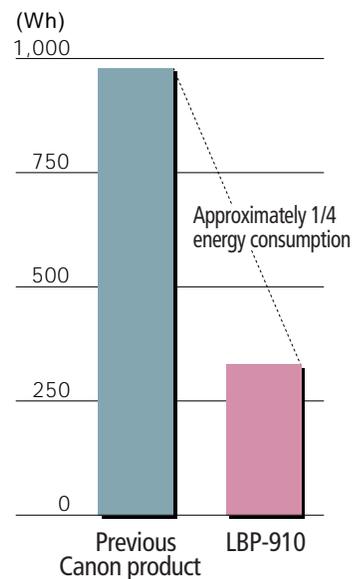
Blue Angel Certification (Germany's Eco-Label)

Canon makes its laser beam printers easy to disassemble and their parts easy to classify by clearly indicating the materials used and by reducing the glued surfaces in its plastic housings and packaging materials. These activities are part of our effort to achieve product designs that have high levels of reusability. As a result, most Canon laser beam printers since the LBP-1760, which was released in 1998, have earned certification under Germany's Blue Angel program, which has some of the strictest requirements in the world.

Daily Energy Consumption

Measurement Conditions

- One page output per 10 minutes (text data)
- Seven-hour measurement (one day)
- Output from sleep mode
- Measured at room temperature



On-Demand Laser Beam Printers

Personal model



LBP-350

Standard models



LBP-740e



LBP-1760e

High-end models



LBP-950

Bubble Jet Printer Designs Focus on Recycling

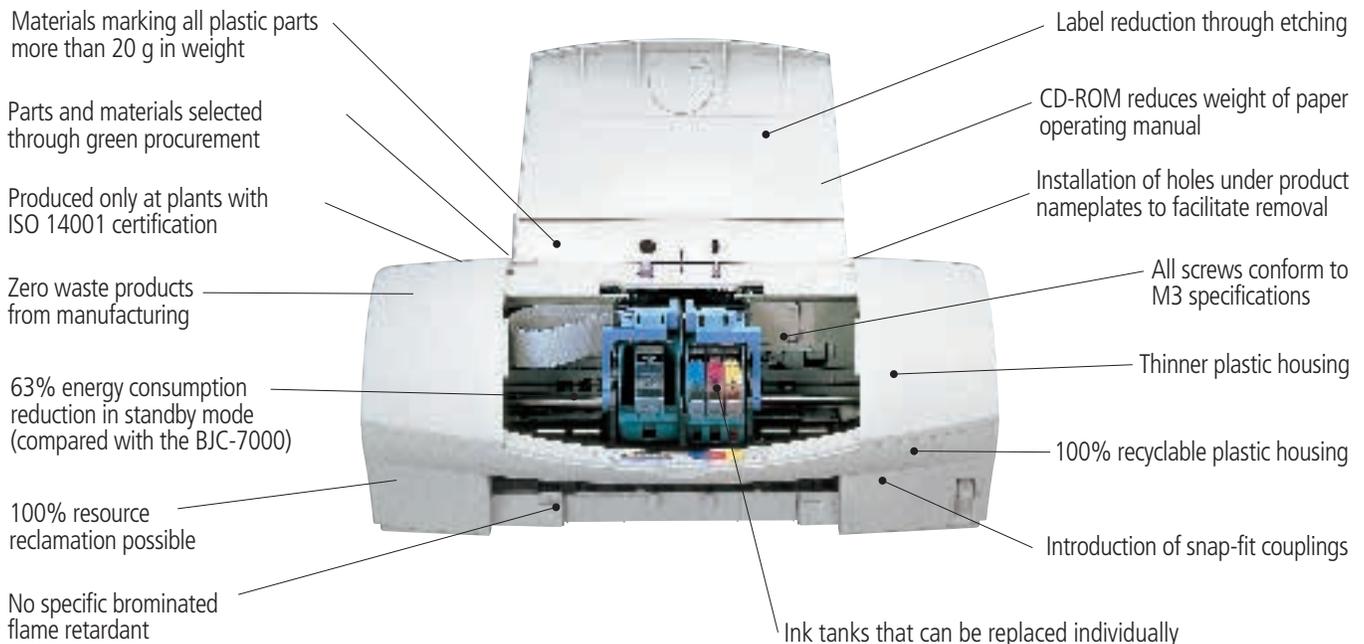
Energy-Saving Designs

Most conventional ink-jet printers are in standby mode for longer periods than when printing, which increases their power consumption. Canon's design emphasis has been to conserve energy not only when printing, but also during these long standby periods. One result of this focus is the BJC-620, which cuts energy consumption when in standby mode to about 63% that of conventional models.

Designs for Resource Conservation

With the BJC-620, we sought to improve resource efficiency through a number of different approaches. For example, by creating thinner plastic housings we achieved a 20% reduction in product weight from previous models. By clearly indicating the materials in the printer's plastic housings, and by removing operating instruction labels and eliminating hazardous substances, we have improved overall recyclability. We have been able to establish closed recycling technologies that help reduce the product's environmental impact by recycling up to 100% of these plastic housings. Other measures included putting the operating manual on CD-ROM, which led to an 80% reduction in the weight of the paper packaged with the BJC-6000. This product clearly exemplifies Canon's commitment to fostering recycling consciousness.

Environmental Features of the BJC-620



Helping Preserve Forests and Eliminate CO₂ and Chlorinated Compounds with Three Kinds of Paper for Office Use

Kenaf Paper (Non-Wood Pulp Paper)

Most experts agree that the earth will not have enough conventional wood pulp to meet worldwide demand for paper in the 21st century. Industry is therefore turning its attention to kenaf, a material with the potential to become an alternative to wood. Kenaf, a plant that prospers mainly in Southeast Asia, will help protect forests while offering higher productivity and absorbing more CO₂ than trees. Expectations are high that kenaf will prove useful in a variety of applications as an environmentally conscious new resource. Canon took the lead in developing kenaf paper, working on a joint development project with a paper manufacturers to commercialize the world's first kenaf paper designed for high-quality copying. We have also created a high-grade 40% compound of kenaf and reclaimed pulp that offers users excellent output quality.



Recycled Paper

Canon's recycled paper compounds contain between 70% and 100% reclaimed pulp. We select different types and ratios of reclaimed pulp for a wide variety of applications. For example, the whiteness of our high-grade recycled paper is almost indistinguishable from that of new paper, but we also offer paper that is less white and which is more suitable to double-sided copying.

Promoting energy conservation in our reclaimed pulp manufacturing processes, we have achieved a 60% reduction in electricity consumption and cut water use in chemical pulp production by about 30%. Finally, all of our recycled paper products are alkaline paper, which is ideal for safely storing documents for long periods of time.



ECF Paper (Pulp Bleaching Method)

Paper is typically made with bleached pulp. The most common method used in Japan involves oxygen and elementary chlorine. Canon, however, produces its Office Planner paper for copying machines and Bubble Jet printers using an elementary chlorine-free (ECF) bleaching method that is common in Europe and the United States. This method cuts down on the usage of chlorine that is thought to be harmful. At the same time, it contributes to environmental conservation by substantial reduction of chlorine emissions in wastewater from paper plants.



Environmental Information Disclosure and Communication—Supporting the Creation of a Recycling Society

There is a growing need for corporate activities that address environmental issues and for the personal involvement of increased numbers of individuals to realize a recycling society. Canon discloses its products' environmental information by using a new type of eco-label.*

Type III Eco-Label

Under standards of the International Organization for Standardization (ISO) and developed nations, three types of eco-labels are currently in use. Type I eco-labels are the result of third-party certification, while Type II labels are provided by companies themselves. Type III eco-labels, which Canon has chosen to use, involve the fuller publicizing of environmental data, which is consistent with the company's goal of disclosing quantitative data in environmental areas.

Canon's labels provide qualitative information in 12 areas corresponding to its product environment outline, including environment-related information on product usage and recycling, as well as 15 areas related to product life cycles and other indicators of eco-efficiency. Information on product life cycles, which is particularly detailed, is divided into five categories—materials and parts, production, distribution, use and recycle and disposal. From July 1999, Canon has disclosed the environmental information on one digital copying machine model and one Bubble Jet printer. Such disclosure is being made for eight kinds of copying machines and 5 kinds of Bubble Jet printers as of May 2000, and we are planning to disclose such information for all the business machines made by Canon from 2001.

* Refer to the "Mini-Glossary of Environmental Terms" on page 60.

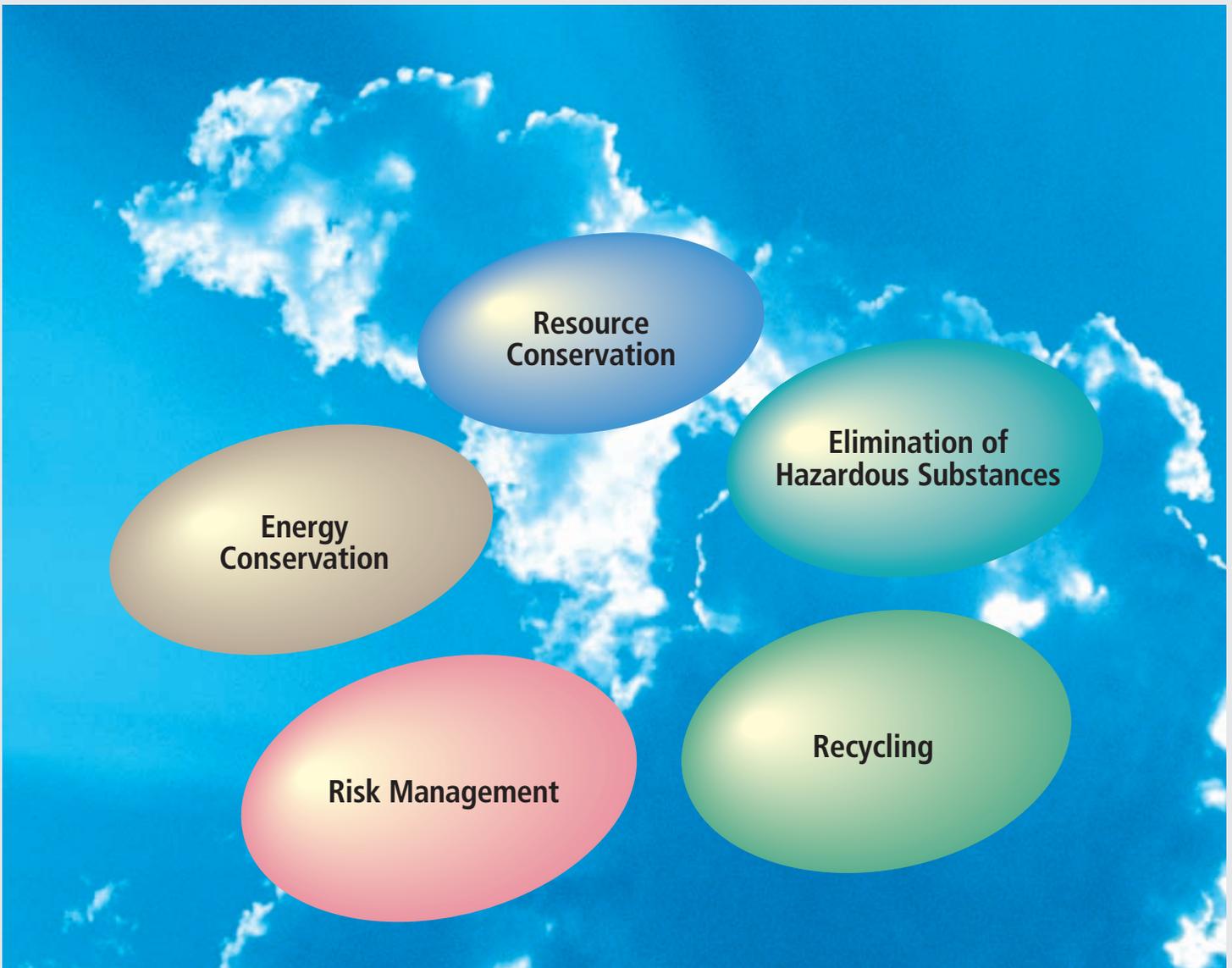
Eco-Label of the GP405 Digital Copying Machine

● Product Environment Outline	
Electricity consumption	Standby (Sleep mode): 73W Energy consumption efficiency: 224Wh
Resource efficiency	Main body weight: 97.5kg, Main body dimensions (W x D x H): 645mm x 720mm x 689mm Space required: 1296mm x 720mm, Use of reused parts and recovered material: Using , Recycling: Operating
Product safety	Contained Chemicals: All parts: No use of specific brominated flame retardants (PBB, PBDE) Plastic housing parts: No use of heavy metals (Pb, Hg, Cr(VI), Cd) Ozone: $\leq 0.02\text{mg/m}^3$ (Blue Angle Measurement Conditions) Operational sound level: $\leq 71\text{dB(A)}$ (copying), $\leq 50\text{dB(A)}$ (standby)
Packaging materials	No use of heavy metals (Pb, Hg, Cr (VI), Cd) (box) Recycling: Operating
Complied standard	VCCI (Class A) , International Energy Star Program *The Canon Group manufacturer of this product holds ISO 14001 certification.

● Eco-efficiency		Mat./parts	Production	Distribution	Use	Recycle/Disposal
		(/unit)	(/unit)	(/100km)	(/10,000sheets)	(/unit)
Energy	Electricity (kWh)	559	124	0.0	51	1
	Fossil fuel (conversion to crude oil: L)	—	2.6	1.2	0.3	1.2
	Gas (MJ)	—	30.4	0.0	0.0	0.0
	Other (MJ)	—	0.0	0.0	0.0	0.0
Resource	Water (Ground water / industrial & city water: L)	—/—	57.5/20.2	0.0/0.0	1.1/2.1	0.0/0.0
	Metal (Ferrous / Non-ferrous: kg)	—/—	86.2/3.5	0.0/0.0	0.1/0.0	0.0/0.0
	Plastic & rubber (kg)	—	25.1	0.0	0.6	0.0
	Glass (kg)	—	2.1	0.0	0.0	0.0
	Others (kg)	—	30.6	0.0	0.6	0.0
	Waste (kg)	—	1.6	0.0	0.2	1.2
Environmental safety:	Greenhouse gas (CO ₂ / PFC, HFC, SF ₆ :kg-C)	174.3/—	15.4/0.0	0.9/0.0	6.4/0.0	1.1/0.0
	Acidification (SO _x , NO _x : g)	—/—	37.0/43.6	8.7/22.9	11.6/10.7	8.7/22.5
	Ozone-depleting chemicals (conversion to CFC: g)	—	0.0	0.0	0.0	0.0
	Water effluent (BOD / COD: mg)	—/—	405/933	0/0	8/14	0/0
Environmental pollutants	PRTR listed chemicals (total use: g)	—	188.8	0.0	1.7	0.0
	"—" indicates levels currently unknown due to lack of sufficient social infrastructure *disclosed based on the Product Environmental Information Sheet (JEMAI Program Basic Data Sheet)					

1999 Environmental Performance Data

Canon has acted in the area of environmental assurance targeting three key issues as energy conservation, resource conservation, and elimination of hazardous substances. In this section, we report the results of 1999 activities focusing on the five categories that include risk management and recycling in addition to the above mentioned three key issues.



1999 Environmental Performance Data

Targets and Results

1999 Group Targets and Results for Applicable Activities: Domestic Operational Sites

A summary of 1999 targets and results for domestic operational sites' autonomous activities plans for applicable activities follows.

Item	1999 Target	1999 Results		
Energy conservation / Global warming prevention	● Operational site: reduce energy consumption to net sales (1990 basis)	27% reduction from the 1990 level	9% reduction from the 1990 level	▶ P48
	● Eliminate use of greenhouse gases (PFCs, HFCs, SF ₆)	Use of 172 tons (3 substances)	Use of 16.2 tons (3 substances) (Elimination complete except for semiconductor applications)	▶ P48
Resource conservation	● Reduce final waste material (1990 basis)	Final waste material volume: 5,651 tons 84% reduction from the 1990 level	Final waste material volume: 2,295 tons 94% reduction from the 1990 level	▶ P49
Elimination of hazardous substances	● Reduce the release of hazardous chemical substances (1996 basis)	Discharge volume: 1,471 tons 15% reduction from the 1996 level	Discharge: 1,031 tons 40% reduction from the 1996 level (Achieved target for 2000)	▶ P52
Environmental management system	● Certification under international environmental management standards (expand scope beyond manufacturing operational sites)	Introduction at combined R&D / manufacturing sites	Acquired ISO14001 certification (Canon Electronics Inc. Headquarters, Kagemori Plant, Akagi Plant)	▶ P53
Green procurement	● Establish green procurement standards	Evaluation of vendors' environment assurance activities	Evaluated 800 vendors	
		Manufacturer studies, evaluation of authorized products	Conducted 400 manufacturer studies About 1,000 authorized products	
Information disclosure	● Disclose site environmental assurance information	Publishing a group report	Published revised edition of <i>Ecology and Environmental Report 1999</i>	
	● Disclose environmental information of products	Disclosure of Type-III eco-labels	Disclosed information on copying machines and Bubble Jet printers	

1999 Main Targets and Results for Applicable Activities: Overseas Operational Sites

A summary of 1999 main targets and results for overseas operational sites' autonomous activities plans for applicable activities follows.

Item	1999 Target	1999 Results	Operational Sites
Energy conservation	● Reduction of 20% in energy consumption by 2000	Achieved 22.3% reduction	Canon Business Machines, Inc.
	● Reduction of 10% in energy consumption (from the 1998 level)	Achieved 17% reduction	Canon Bretagne S.A.
Resource conservation	● Limit waste discharge to 227 tons	122.1 tons	Canon Business Machines, Inc.
	● Reduce waste by 1.5% or more (from the 1998 level)	Decrease to 2%	Canon Hi-Tech(Thailand)Ltd.
	● Industrial waste of 73 tons or less	47 tons	Canon Zhuhai, Inc
	● Total waste discharge of 874 tons or less	698 tons	Canon Zhuhai, Inc
	● Reduction in water consumption by 10% (from the 1998 level)	Achieved 20% reduction	Canon Bretagne S.A.
Elimination of hazardous substances	● Reduction in use of chemical substances in the pentaprism process by 20%	Achieved 41% reduction	Canon Opto(Malaysia)Sdn.Bhd

1999 Environmental Performance Data

Japan Region: Environmental Management Performance of Operational Sites

Environmental management data for the environmental assurance activities of each operational site is centrally managed at the Environment Engineering Center at corporate headquarters. Although the environmental management items that require monitoring vary depending on regional

characteristics and an individual operational site's activities, each site sets down its own standards and implements stricter regulations than mandated by law. The Shimomaruko headquarters has been selected as an illustrative example.

Environmental Management Items: Water, Air, Noise, Vibration, Odors

1999 data for the Canon Inc. headquarters

- Address: 3-30-2, Shimomaruko, Ohta-ku, Tokyo
- Established: 1951
- Activities: Headquarters management, product operations, research and development
- Employees: 5,173
- Area: 81,036 m²
- Designation of land use: Industrial district

Water Quality					
	Item	Wastewater standards	Operational site standards	Actual results Max.	
Health	cadmium	(mg/l)	0.1	0.08	<0.005
	cyanide	(mg/l)	1.0	0.8	<0.05
	lead	(mg/l)	0.1	0.08	<0.005
	hexavalent chromium	(mg/l)	0.5	0.4	<0.05
	arsenic	(mg/l)	0.1	0.08	<0.005
	total mercury	(mg/l)	0.005	0.004	<0.0005
	alkyl mercury	(mg/l)	NA	NA	NA
	dichloromethane	(mg/l)	0.2	0.16	<0.001
	carbon tetrachloride	(mg/l)	0.02	0.016	<0.001
	1,2-dichloroethane	(mg/l)	0.04	0.032	<0.001
	1,1-dichloroethylene	(mg/l)	0.2	0.16	<0.001
	Cis-1,2-dichloroethylene	(mg/l)	0.4	0.32	<0.001
	1,1,1-trichloroethane	(mg/l)	3.0	2.4	<0.001
	1,1,2-trichloroethane	(mg/l)	0.06	0.048	<0.001
	trichloroethylene	(mg/l)	0.3	0.24	<0.001
	tetrachloroethylene	(mg/l)	0.1	0.08	<0.001
	1,3-dichloropropene	(mg/l)	0.02	0.016	<0.001
	thiuram	(mg/l)	0.06	0.048	<0.001
	simazine	(mg/l)	0.03	0.024	<0.001
	thiobencarb	(mg/l)	0.2	0.16	<0.001
benzene	(mg/l)	0.1	0.08	0.0046	
selenium	(mg/l)	0.1	0.08	<0.005	
Living Environment	potential of hydrogen (pH)		5.0~9.0	5.9~8.5	6.8~7.9
	biochemical oxygen demand (BOD)	(mg/l)	600.0	480.0	110.0
	suspended solid (SS)	(mg/l)	600.0	480.0	200.0
	n-hexane extracts substances (mineral oil)	(mg/l)	5.0	—	<5.0
	n-hexane extracts substances (animal and vegetable oil)	(mg/l)	30.0	—	25.0
	phenol	(mg/l)	5.0	4.0	0.063
	copper	(mg/l)	3.0	2.4	<0.2
	zinc	(mg/l)	5.0	4.0	0.5
	soluble iron	(mg/l)	10.0	8.0	1.0
	soluble manganese	(mg/l)	10.0	8.0	<0.1
	chromium	(mg/l)	2.0	1.6	<0.05
	fluorine	(mg/l)	8.0	6.4	1.1
	boron	(mg/l)	10.0	8.0	<0.1
	phosphorous	(mg/l)	32.0	26.0	4.8
	nitrogen	(mg/l)	240.0	192.0	9.2
	iodine consumption	(mg/l)	220.0	176.0	<5.0

Air Quality			
	Item	Operational site standards	Actual results Max.
Boiler	NOx (ppm)	76.0	49.0
	dust (g/Nm ³)	0.05	0.003

Note: * Standard for the Air Pollution Control Law is used as operational site standard

* Boilers emit no SOx because they use LNG

Noise		
	Operational site standards	Actual results Max.
Morning	60	56
Day	70	under 62
Evening	60	56
Night	55	55

Note: Tokyo municipal standard is used as operational site standard

Vibration		
	Operational site standards	Actual results Max.
Morning	60	56
Day	70	59
Evening	60	56
Night	55	55

Note: Tokyo municipal standard is used as operational site standard

Malodor
Note: No measurements were taken during 1999 because there is no risk of emission of odors. Measurements will be taken in the future if there is a possible affect on the neighborhood in cases such as building a facility that may give out an odor.

Note: * Legal and regulatory standards: The most stringent legal regulations (Sewage Law and Tokyo municipal sewage ordinances)

* Site standards: 80% of the most stringent legal regulations

1999 Environmental Performance Data

Overseas Regions: Environmental Management Performance of Operational Sites

Standards for overseas operational sites vary widely from country to country. Canon takes a global view and sets the same standards as for Japan or stricter standards for all operational

sites worldwide. Canon Bretagne S.A., located in France, has been selected as an example operational site.

Environmental Management Items: Water, Air, Noise, Vibration, Odors

1999 data for Canon Bretagne S.A.

- Address: Les Landes de Beaugé, 35345 Liffré Cedex, France
- Products manufactured: office imaging products, chemical products
- Area: 191,258 m²
- Established: 1983
- Number of employees: 752
- Zoning designation: industrial area

Water Quality				
Item		Wastewater standards	Operational site standards	Actual results Max.
potential of hydrogen (pH)		5.5~8.5	5.5~8.5	7.05
chemical oxygen demand (COD)	(mg/l)	125.0	100.0	59.0
suspended solid (SS)	(mg/l)	100.0	80.0	19.0
total hydrocarbons	(mg/l)	10.0	8.0	<0.01
cyanide	(mg/l)	0.1	0.08	<0.01
copper	(mg/l)	0.5	0.4	<0.02
tin	(mg/l)	2.0	1.6	<0.01
manganese	(mg/l)	1.0	0.8	0.007
chromium	(mg/l)	0.5	0.4	<0.005
nickel	(mg/l)	0.5	0.4	0.012
lead	(mg/l)	0.5	0.4	<0.002
iron + aluminum	(mg/l)	5.0	4.0	0.73
arsenic	(mg/l)	0.05	0.04	<0.01
mercury	(mg/l)	0.05	0.04	<0.01
cadmium	(mg/l)	0.2	0.16	<0.0002

Note: * Legal and regulatory standards: The most stringent legal regulations (Water Quality Protection Law and prefectural ordinances)

* Site standards: 80% of the most stringent legal regulations

Air Quality

Note: Because there are no dust emissions (such as from boilers) no measurements were taken for 1999. Measurements will be taken in the future should an affect on the neighboring area be anticipated.

Noise

Unit: dB

Category	Operational site standards	Actual results Max.
Morning	60	56
Day	70	under 62

Note: Operational site standard: noise ordinance values have been applied (at the site boundary)

Vibration

Note: No measurements were taken for 1999. (There are no applicable regulatory standards at Canon Bretagne S.A.) However, to avoid any affect on the neighboring area measures are taken to avoid vibrations when buildings are constructed or facilities installed or during plant's operation.

Malodor

Note: No measurements were taken during 1999 because there are no substances that could have affected the neighboring area. Measurements will be taken in the future if there is a possible affect on the neighborhood in cases such as building a facility that may give out an odor.

Information for other operational sites has been disclosed and can be viewed on the Canon website.

1999 Environmental Performance Data

Global Warming Prevention Measures

Energy Conservation at Operational Sites

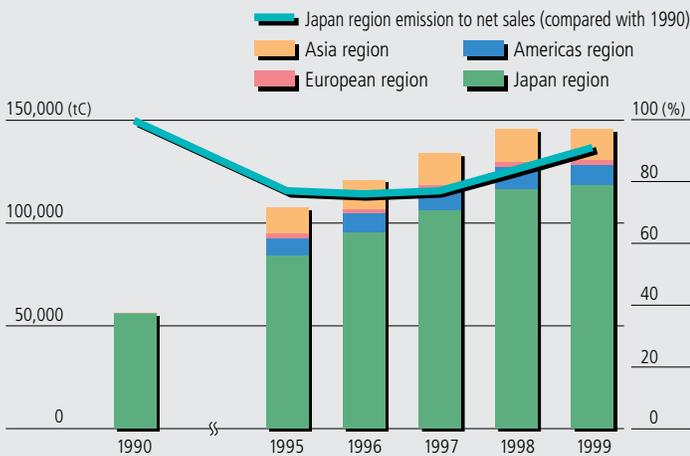
1999 marked the most successful performance for energy conservation in the Japan region since the establishment of energy conservation activities in 1990: the 5,913 tC (carbon dioxide basis) reduction in energy consumption was the highest ever, equivalent to the energy consumed by the largest operational site in the Canon Group. However, due to the startup of newly established operational sites* energy consumption increased slightly

* Ayase Office, Oita Canon Materials, Canon Electronics Akagi Plant

1999 Energy Consumption Results

	Electricity	Gas	Oil	Other	Total
Japan region	87,953	8,571	22,298	0	118,822
Americas region	8,556	1,397	0	0	9,953
European region	2,063	154	21	0	2,238
Asia region	13,511	151	438	1,042	15,143

Change in Carbon Dioxide Emissions to Net Sales in the Japan Region



1999 Energy Conservation Result (Japan Region)

Item	Amount of energy conserved
Savings from heating and air conditioning	5,127
Improvements in manufacturing equipment and processes	378
Improvements in lighting	30
Education & other activities	378
Total	5,913

1999 Main Energy Conservation Measures (Overseas Regions)

Region	Main measure
Americas region	Increased efficiency of air conditioning facilities
European region	Improved operations of manufacturing facilities (such as control of operation time)
Asia region	Increased efficiency of facilities (such as inverter control)

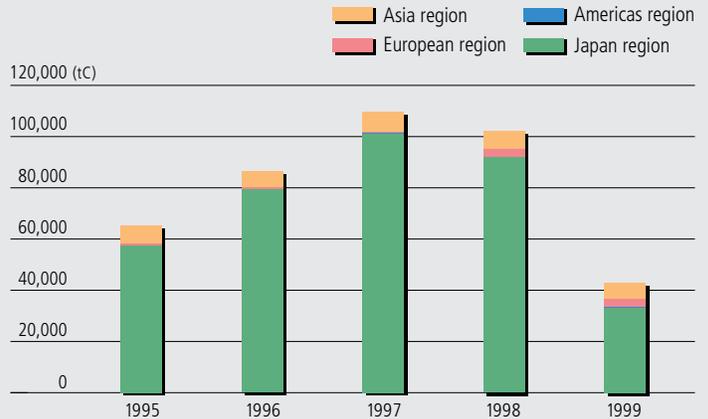
Elimination of Non-energy Greenhouse Gases

In addition to energy conservation measures, Canon's global warming prevention activity involves working toward the elimination of non-energy greenhouse gases such as perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF₆). During 1999 all operational sites worldwide succeeded in abolishing the use of non-energy greenhouse gases apart from a few applications where substitution is impossible. This resulted in total carbon dioxide emissions from both energy and non-energy sources during 1999 of 151,892 tC for the Japan region, a reduction of 27% from the prior year.

Result of 1999 Carbon Dioxide Emissions of PFCs, HFCs, and SF₆

	PFCs	HFCs	SF ₆	Total
Japan region	30,055	298	2,717	33,070
Americas region	383	0	0	383
European region	2,997	0	0	2,997
Asia region	6,499	52	0	6,551

Change in Carbon Dioxide Emissions of PFCs, HFCs, and SF₆



Reductions in Carbon Dioxide Emissions Due to Greater Efficiency in Distribution

Canon has adopted measures to increase efficiency in distribution to reduce emissions of carbon dioxide and air pollutants arising from the distribution of our products. At present Canon is implementing in stages management of environmental impact data covering both the purchase of materials and parts from our major vendors and transport of finished products from the time they leave our factories until they are delivered to customers. In terms of actual distribution efficiency, we have reduced the environmental impact of product distribution by correcting transport inefficiencies (low-load vehicles and low-load hauling over long distances), consolidating delivery sites, and introducing modal shift. This resulted in a decrease in annual truck travel distance of 12 million kilometers in the Japan region during 1999, making possible a decrease in carbon dioxide emissions of 5,800 tC.

1999 Environmental Performance Data

Resource Conservation

Reductions in Final Waste Disposal and Promotion of Recycling

Canon's goal is to reduce final waste disposal in the Japan region in 2000 by 95% compared to 1990 levels. During 1999 activities to control the generation of waste material and efforts to promote recycling resulted in final waste disposal of zero waste* at 27 of 43 operational sites, a reduction of 94% compared to 1990. As in Japan, overseas operational sites have established goals for reducing final waste disposal and are implementing measures appropriate for their respective regions.

* Excluding material disposed of by administrative responsibility

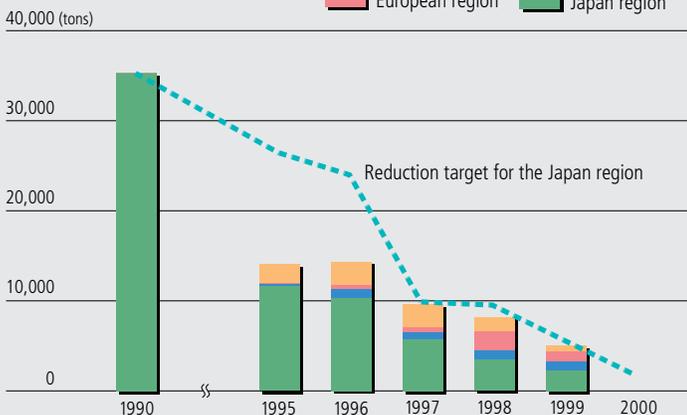
Result of 1999 Final Waste Disposal

(tons)

	Gross waste generation	Final waste disposal	Recycled material
Japan region	42,235	2,295	39,940
Americas region	5,843	970	4,873
European region	4,045	1,111	2,934
Asia region	6,423	653	5,770

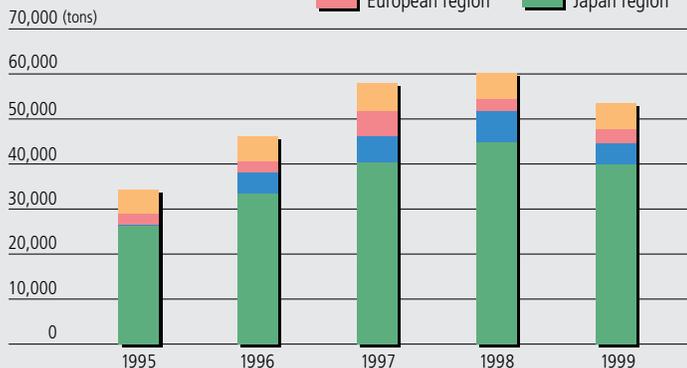
Change in Final Waste Disposal Volume

■ Asia region ■ Americas region
■ European region ■ Japan region



Change in Recycling Volumes

■ Asia region ■ Americas region
■ European region ■ Japan region



Effective Use of Water Resources

Each operational site is engaged in measures to promote the effective use of water resources including water recycling. Opened in 1999, our Oita Canon Materials has achieved complete closed recycling, releasing into the environment no water other than rainwater. Despite the opening of new operational sites during 1999, annual water use decreased 4.8% compared to the prior year and the water use to sales ratio has decreased 58% compared to 1990. The water use in the operational sites overseas has decreased after reaching the highest in 1997.

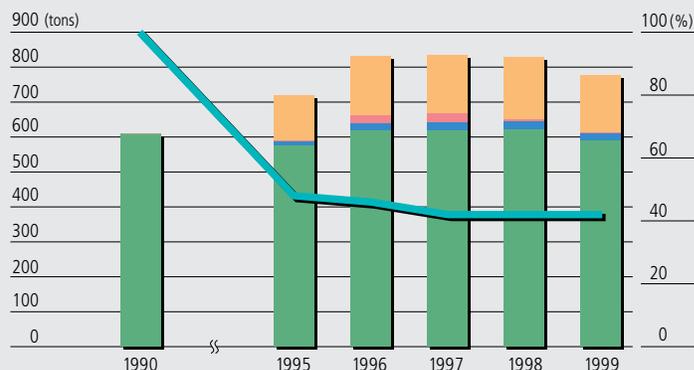
Result of 1999 Water Resources Use

(ten thousand m³/year)

	Volume of use
Japan region	590
Americas region	21
European region	3
Asia region	163

Change in Water Resources Use

— Japan region consumption to net sales (compared with 1990)
■ Asia region ■ Americas region
■ European region ■ Japan region



1999 Environmental Performance Data

Elimination of Hazardous Chemical Substances

PRTR Control Balance Sheet (Japan Region)

Since 1996 Canon has implemented control of volume of use, consumption, and release into the environment of 1968 substances that Canon designated to control in the Japan region in compliance with the Environment Agency's Pollutant Release and Transfer Register (PRTR). Our report here is on the control of Class One Specified Chemical Substances (354 substances) as laid out in "the Law Concerning Identifying the Volume

of Specified Chemical Substances Released into the Environment and the Promotion of Management Improvements" enforced on July 13, 1999. In 1999 the volume of these substances released into the environment and transferred to waste material was 208 tons. With 97% of this released into the atmosphere, exhaust control such as measures for collecting or removing these substances has become an important issue.

(Unit: tons/year)

No.	Substance #	Substance	Emissions into the atmosphere	Discharge into water	Transfer to waste
1	1	zinc and zinc compounds	0	0.04	0.01
2	16	2-aminoethanol	4.51	0	0
3	43	ethylene glycol	0	0.15	0.37
4	44	ethylene glycol monoethyl ether	6.81	0	0
5	63	xylene	22.40	0	0.05
6	93	chlorobenzene	79.27	0	0
7	96	chloromethane	0.02	0	0
8	139	o-dichlorobenzene	0.24	0	0
9	145	dichloromethane	28.28	0	0
10	172	N,N-dimethylformamide	3.86	0	0
11	177	styrene	0.10	0	0
12	207	copper water-soluble salts (excluding complex salt)	0	0.06	0
13	224	trimethyl benzene	6.41	0	0
14	227	toluene	48.50	0	0.93
15	230	lead and lead compounds	0.04	0	0.92
16	232	nickel compounds	0	0.11	0
17	283	hydrogen fluoride and its water soluble salts	0.14	4.51	0
Total			200.58	4.87	2.28

Note: The above PRTR data details volumes released into the environment or transferred to waste for Class One Specified Chemical Substances (354 substances) for which annual volume of use is five tons or more.

1999 Environmental Performance Data

Elimination of Hazardous Chemical Substances

PRTR Balance Control Achievement (Americas Region: TRI)

Overseas operational sites conduct PRTR management according to the regional circumstances of each site. In the Americas region operational sites manage 578 specified chemical substances in accordance with the Environmental Protection Agency's Toxic Release Inventory (TRI), reporting the

EPA yearly on release volumes and transfer volumes. Volumes released into the environment (the atmosphere and water) in the Americas region were 115 tons in 1999.

(tons/year)

No.	Substance	Emissions into the atmosphere	Discharge into water	Transfer to waste
1	xylene	0.88	0	72.50
2	chlorobenzene	2.72	0	16.31
3	methyl ethyl ketone	1.99	0	0.97
4	methanol	3.37	0	0.80
5	dichloromethane	2.23	0	13.17
Total		11.19	0	103.75

Note: 1. Number of substances designated under TRI: 578 substances

2. The above TRI performance data covers substances in quantities of 10,000 pounds (4,535 kg) or higher for which reports must be issued to the competent authorities.

1999 Environmental Performance Data

Elimination of Hazardous Chemical Substances

Reduction of Hazardous Chemical Substance Emissions

Canon has divided the 1968 designated chemical substances into three control levels and has been aiming at reducing the volume of emissions by 20% from the 1996 level by the year of 2000. With 1999 emissions at 40% of the 1996 level, we have already far exceeded the target for 2000. This success is due to measures including introduction of removal equipment for hydrogen chloride, efforts to eliminate dichloromethane, and other emission control activities.

1999 Hazardous Chemical Substance Emissions (Japan Region) (tons)

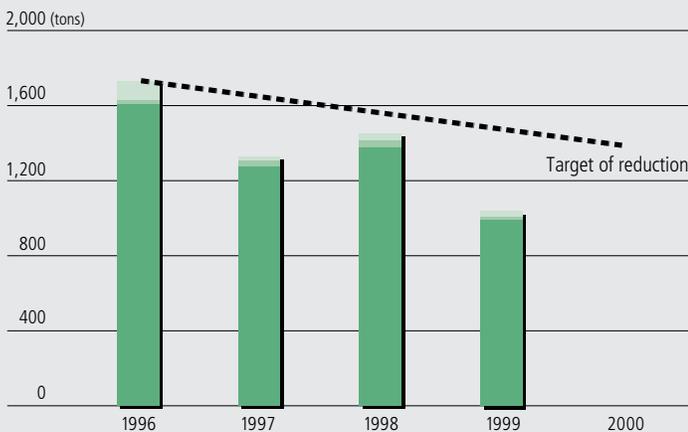
Control level	Emission			Total
	Air	Water	Waste	
Rank A	28.3	0.0	0.0	28.3
Rank B	20.2	0.1	1.2	21.5
Rank C	663.6	272.8	51.0	987.4

* Control levels have been set and control initiated for 1968 substances.

Rank A: provision for the prohibition of chemical weapons, The Law concerning the Examination and Regulation of Manufacture etc. of Chemical Substances (Class One and Class Two Specified Chemical Substances), others
 Rank B: High priority hazardous atmospheric pollutants, Water Pollution Control Law (health items), greenhouse gases, others

Rank C: Poisonous and Deleterious Substances Control Law, substances designated under OECD and PRTR, Basel Convention, others

1999 Total Emission of Hazardous Chemical Substances (Japan Region)



Elimination of Organic Chlorine Solvents

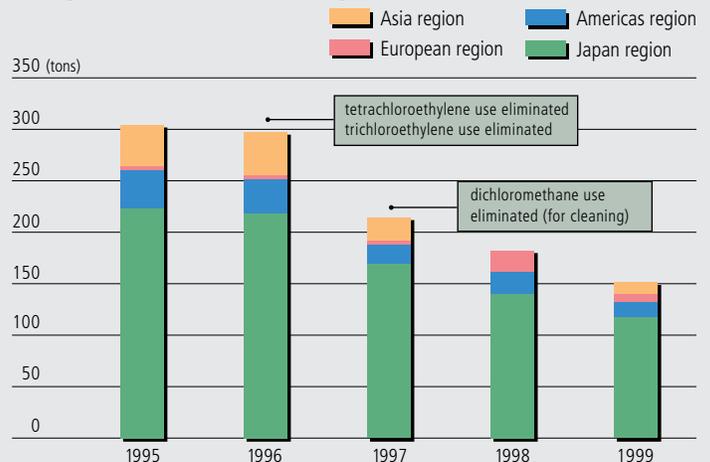
Canon has striven since 1993 to halt the use of organic chlorine solvents*, which have been found to have carcinogenic properties. In 1997 the use of these substances for cleansing was banned completely at all operational sites worldwide. Also we have installed collection devices and rigorously controlled emissions of dichloromethane, a solvent that continues to be used in a few applications. Development of alternative technologies is complete and at present we are phasing in alternative technology beginning with the Japan region.

* trichloroethylene, tetrachloroethylene, dichloromethane

1999 Dichloromethane Usage (Other Applications) (tons)

Region	Usage (tons)
Japan region	117
Americas region	15
European region	8
Asia region	11

Change in Dichloromethane Usage



1999 Environmental Performance Data

Risk Management

Acquiring ISO Certification

In 1995 Canon became the first company in Japan to be certified under BS7750 and began challenging the requirements of ISO 14001 certification to promote more systematic and efficient implementation of environmental protection activities at its operational sites worldwide. As of 1999, three operational sites, including those involved in management and R&D, have obtained ISO 14001 certification.

ISO Certified Sites and Subsidiaries

Site/Subsidiary	Certified date (month/year)
Ami Plant	February 1995
Ueno Chemical Products Plant	February 1995
Toride Plant	May 1995
Fukushima Plant	September 1995
Hirosaki Seiki, Inc. Ishiwatari / Kitawatoku plants	September 1995
Canon Electronics Inc. Misato Plant	October 1995
Canon Aptex Inc.	November 1995
Canon Bretagne S.A.	November 1995
Nagahama Canon Inc.	December 1995
Utsunomiya Plant	January 1996
Oita Canon Inc.	January 1996
Canon Inc., Taiwan	April 1996
Nippon Typewriter Co., Ltd. Iwai Plant	July 1996
Canon Chemicals Inc. Tsukuba Headquarters	July 1996
Copyer Co., Ltd. Kofu Plant	November 1996
Canon Hi-Tech (Thailand) Ltd.	November 1996
Copyer Co., Ltd. Fukui Plant	November 1996
Copyer Co., Ltd. Tachikawa Plant	November 1996
Canon Opto (Malaysia) Sdn. Bhd.	December 1996
Canon Business Machines, Inc.	December 1996
Canon Components, Inc.	February 1997
Hanawa Seiki, Inc.	February 1997
Canon Zhuhai, Inc.	March 1997
Miyazaki Daishin Canon Co., Ltd.	March 1997
Canon Chemicals Inc. Iwama Plant	April 1997
Canon Dalian Business Machines, Inc.	July 1997
Canon Giessen GmbH	October 1997
Canon Virginia, Inc.	December 1997
South Tech, Inc.	December 1997
Canon (Schweiz) AG	December 1997
Utsunomiya Optical Products Operations	December 1997
Canon Chemicals Inc. Ishige Plant	January 1998
Tamagawa Plant	November 1998
Hiratsuka Development Center	December 1998
Canon Business Machines de México, S.A. de C.V.	December 1998
Canon Electronics Inc. Akagi Plant	June 1999
Canon Electronics Inc. Headquarters Kagemori Plant	July 1999
Custom Integrated Technology, Inc.	December 1999

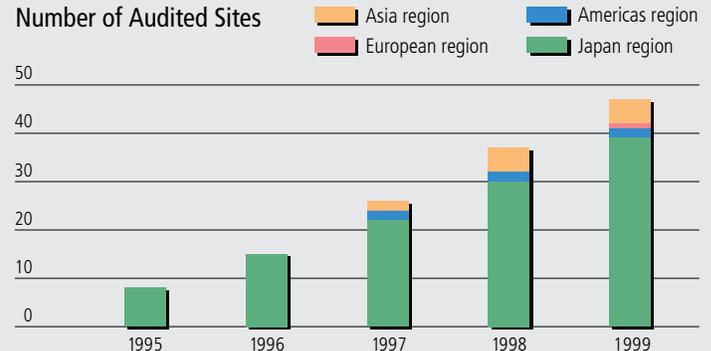
Environmental Audits by Canon Headquarters

As a supplement to environmental surveillance by certified outside organizations, we conduct internal environmental audits by Canon Inc.'s headquarters Environment Engineering Center. The purpose of these activities is to inspect the actual environmental management conditions at Canon operational sites from a third-party standpoint. Audits are conducted by teams of specialists within the Environment Engineering Center. During 1999 audits were conducted at ten sites including domestic and overseas operational sites.

1999 Environmental Audit

Site/Subsidiary	Audited month
Copyer Co., Ltd. Kofu Plant	February
Nippon Typewriter Co., Ltd. Iwai Plant	March
Copyer Co., Ltd. Fukui Plant	April
Canon Manufacturing U.K.	May
Canon Electronics Inc. Misato Plant	June
Tamagawa Plant	July
Hiratsuka Development Center	September
Canon Electronics Inc. Headquarters Kagemori Plant	October
Toride Plant	November
Miyazaki Daishin Canon Co., Ltd.	November

Number of Audited Sites



Environmental Analysis and Measurement

The Environmental Analysis Center certified as the Environmental Measurement Certifier Organization are located in Canon Inc.'s Environment Engineering Center and handles all the environmental analysis of the operational sites. In 1999, the number of samples analyzed was 88,082. In order to reinforce the control system, we are intending to increase the samples.

1999 Environmental Analysis (Japan Region)

Number of samples analyzed	88,082
Field of analysis	Water, air, odor, soil, waste, working environment, noise, vibration, electrical field strength

1999 Environmental Performance Data

Product Recycling

Copying Machine

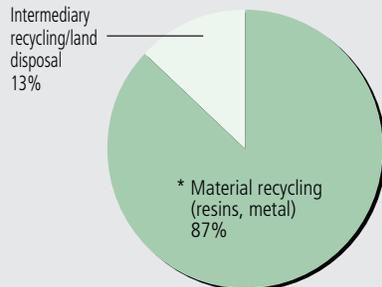
The number of copying machines collected has increased each year in keeping with the establishment of collection systems. Collecting performance increased sharply during 1999 because collecting volumes for the European region have been added to the data. The recoverable ratio averages 87%.

Copying Machines Collected (All Regions)

	1995	1996	1997	1998	1999
Units collected	71	77	75	75	128

(thousands of units)

1999 Recoverable Ratio: 87% (All Regions)



* Inclusive of reuse of parts and remanufacturing of used machines

Toner Cartridge

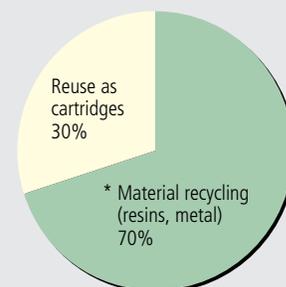
Collection of used cartridges began in 1990 in the United States, Germany, and Japan and recycling began the following year at Canon Dalian Business Machines, Inc. Collection is conducted on a global scale and collection volume continues to increase each year. During 1999 collection of weight increased 21% compared to the prior year. Through these collection and recycling activities Canon contributes substantially to reducing environmental impact.

Toner Cartridges Collection Weight (All Regions)

	1995	1996	1997	1998	1999
Weight of cartridge collected	5,820	7,127	8,196	10,025	12,175

(tons)

1999 Recoverable Ratio: 100% (Canon Dalian Business Machines)



* Inclusive of reuse of resin for cartridges

Bubble Jet Ink Cartridge

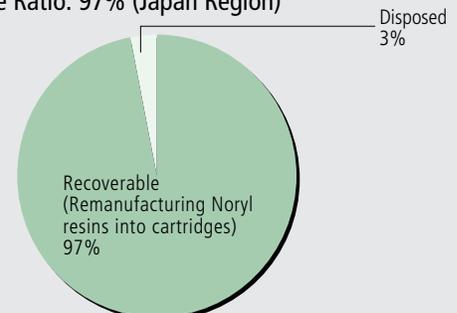
Collection and recycling of Bubble Jet ink cartridges began in 1996 in the Japan region. Approximately nine tons were collected in 1999, about 2.4 times the volume the prior year. Recycling volume is steadily increasing and forecasted collection volume for 2000 is 18 tons. Including closed recycling, the recoverable ratio exceeds 97% in weight.

Bubble Jet Ink Cartridge Collection Weight (Japan Region)

	1996	1997	1998	1999
Collection weight	0.4	2.2	3.8	9.0

(tons)

1999 Recoverable Ratio: 97% (Japan Region)



1999 Environmental Performance Data

Product Recycling

Polystyrene

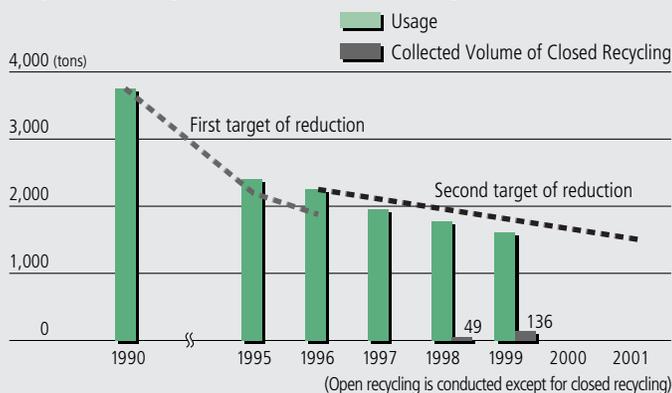
Canon has striven since 1991 to reduce the use of packaging materials. While reducing our use of styrene foam through such means as changes to package design specifications, in 1998 we implemented closed recycling of this material.

1999 Polystyrene Collection/Recycling (Japan Region) (tons)

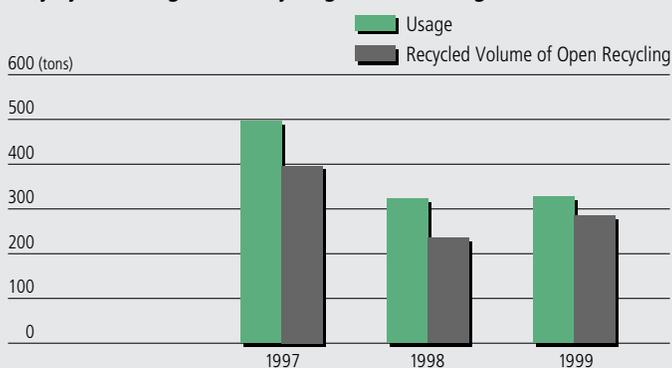
Volume of use	Closed recycling collection volume	
	Collected Volume	Recycled volume
1,616.0	136.4	175.5*

*Recycled volume includes collected volume of 1998

Polystyrene Usage and Collection (Japan Region)



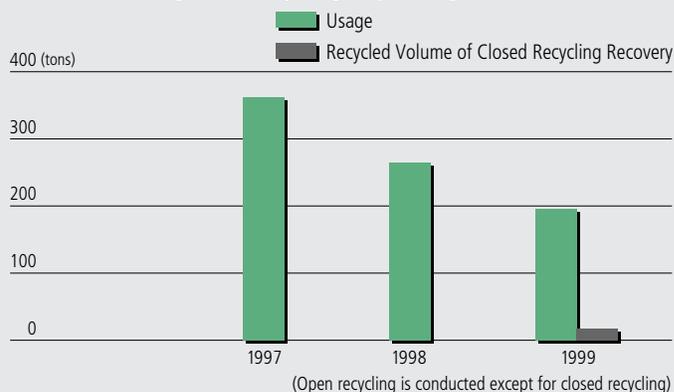
Polystyrene Usage and Recycling (Overseas Regions)



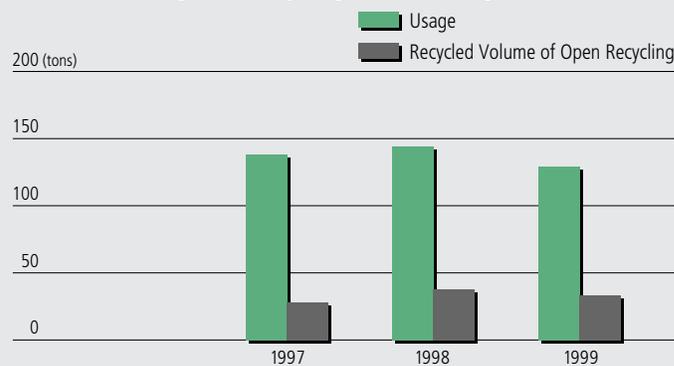
Stretch Film

Stretch film is film used to prevent shifting of packages in transit. Beginning in 1999 Canon began closed recycling in the Japan region. Although still small in scale, this effort is aimed at reducing the environmental impact from the use of packaging material in the same way as the effort to recycle of styrene foam.

Stretch Film Usage and Recycling (Japan Region)



Stretch Film Usage and Recycling (Overseas Regions)



1999 Environmental Performance Data

Personnel Involved in Environment-related Work, Training and Industrial Safety

The Number of Personnel Involved in Environment-related Work

The number of personnel involved in activities relating to the environment has increased in recent years reflecting Canon's belief that an increase was necessary to solve a wide range of environmental problems.

Personnel Involved in Environment-related Work (Japan Region)

(Year)	1998	1999
Headquarters planning and management sections	65	77
Management section in operational sites/ product operations	248	173
Research and development sections	156	140
Environment personnel (concurrent post)	1,347	1,657
Total	1,816	2,047

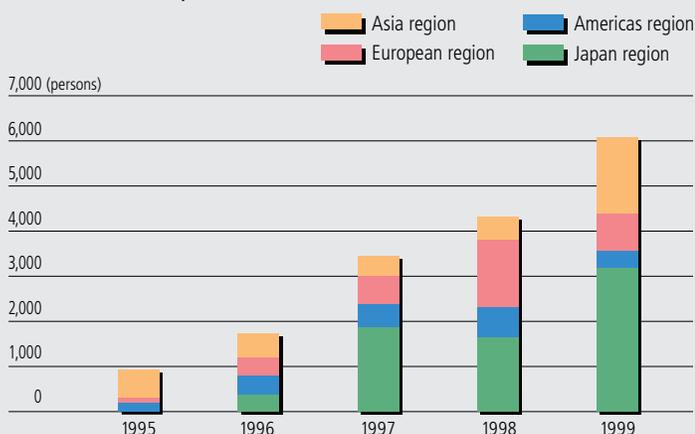
Environmental Education

To enrich the company's environmental conservation activities environmental awareness on the part of each employee is important. In the year of 1999, training on environmental issues was given to 6,068 employees worldwide.

1999 Environment Education (All Regions)

Course	Participants
Japan region	
New Employee Training	1,156
Environment Assurance Staff Training	310
Internal Auditor Development Training	168
New Assistant Manager and Foreman Training	44
Overseas regions	
New Employee Training	2,010
Environment Assurance Staff Training	359
Auditor and Internal Auditor Development Training	87
Other Training	1,934

Number of Participants in Environment Education



Working Environment

Canon devotes efforts not only to environmental issues attendant on manufacturing and production activities, but also on employee's working environment in the company's workplaces. The number of incidents of Category 3 decreased by 65% during 1999 compared to the previous year.

1999 Working Environment Inspection (Japan Region)

	Category 1	Category 2	Category 3	Total
Number of workplaces inspected	872	17	6	895

Category 1: Working environments in which hazardous substances are used, but the workplace is operated satisfactorily, and the conditions should be maintained.

Category 2: A working environment that ranks between Category 1 and Category 3, and requires improvements.

Category 3: A working environment in which significant environmental improvement is required

Industrial Accidents

To reduce the number of workplace accidents Canon has organized a Safety and Sanitation Committee within the company. We are proactively involved in creating workplaces where employees can work with peace of mind.

1999 Industrial Accidents

	Accidents requiring worker's leave from job	Accidents not requiring worker's leave from job	Total
Japan region	17	116	133
Americas region	42	202	244
European region	25	30	55
Asia region	4	102	106

Eco-Contribution and Awards

Major Activities Supporting Environmental Preservation

Japan

- Supporting National Geographic.
- Supporting UNEP (United Nations Environment Program).
- Supporting WWF (World Wild Fund For Nature).
- We actively cooperate in environmental preservation policies promoted by regional government bodies, such as those involving beautification activities.

The Americas

Canon U.S.A.

- Clean Earth Campaign
Canon supports the Nature Conservancy and the National Park Foundation—two of the most active environmental protection organizations in the United States.
- Several times a year, employees of Canon U.S.A. go to nearby national parks and Nature Conservancy preserves to actively help through activities such as planting trees and cleaning up shores.
- Canon U.S.A supports the Envirothon, a contest that promotes awareness of environmental issues among high school students nationwide.
- We support environmentally related Nature Series broadcasts by the national Public Broadcasting System television channel.
- We have established the National Park Fund, a scholarship fund that supports the efforts of students earning their doctorate degrees in environment-related fields.

Canon Canada

- Canon Clean Earth Campaign
Canon Canada began participating in the Clean Earth Campaign in 1991. Since the start of this program, Canon Canada has collected 362,000 toner cartridges for recycling. For each cartridge that it collects, Canon Canada contributes C\$1.00 toward environmental preservation and the protection of endangered animal species. To date, Canon Canada has contributed C\$362,000 to the Nature Conservancy of Canada and the World Wildlife Fund (Canada).

Europe

Canon Europa

- WWF Conservation Partner
Canon Europa is a Conservation Partner of the World Wide Fund for Nature (WWF). Canon Europa's efforts include lending assistance to a project to digitize the WWF library of photos, which has been renamed the WWF—Canon Photo Library.

Canon Manufacturing U.K.

- We sponsor an annual photography exhibition with the environment as its theme.

Oceania

Canon New Zealand

- Society for the Prevention of Cruelty to Animals (SPCA)
We support the continuance and administration of this society, which was established in Auckland to help prevent cruelty to animals.
- Yellow-Eyed Penguin Trust
We donate copying machines to this environmental organization.

Canon Australia

- We contribute approximately A\$20,000 per year to the Clean Up Australia campaign.

Asia

Canon Hi-Tech (Thailand)

- Since 1993, we have supported the planting of mangrove trees in Thailand. The company also helps plant trees at schools and other public facilities.

Canon Dalian Business Machines

- Starting in 1994, we have contributed RMB1, 740,000 to the Dalian Development Region Public Chemical Disposal Processing Company to help them conduct research on toner recycling.

Environmental Preservation Awards

March	1998	Fiscal 1997 Exemplary Energy Company of the Province (Canon Dalian Business Machines)	Dalian, PRC
June	1998	Environmental Scale (Regional Environment Assurance Plant) Award (Canon Inc., Taiwan)	Tanzte, Taiwan
June	1998	Award for Excellence at the Green Purchasing Awards	Green Purchasing Network
1999		Gold & Silver Awards (Canon Virginia, Inc.)	(HRSD) Hampton Roads Sanitation District
May	1999	Science and Technology Minister Award	Fuji Sankei Group
May	1999	BREEAM (Building Research Establishment Environmental Assessment Method) (United Kingdom)	
May	1999	Excellent Electrical Streamlining Plant "Outstanding Performance Award"	Kanto Region Electrical Streamlining Committee
June	1999	1998 Advanced Environment Conservation Unit (Award received by: Canon Dalian Business Machines)	Dalian Development Area Management Committee
July	1999	Award for Excellence of the Eco-Life Lake Biwa Awards	Shiga Prefecture, Nihon Keizai Shinbun Inc.
July	1999	Environmental Technology Award	Japan Society of Civil Engineers
July	1999	Electric Equipment Packaging Category Award	Japan Packaging Institute
September	1999	Return mark (France)	The Environment and Energy Management Agency
September	1999	Environmental Sales Company of the year (Sweden)	Oscar Dellert CO.
October	1999	Eco Hitech Award 1999 (Italy)	Ecoqual'IT (Italian consortium of the IT company that care the environment)
October	1999	City of Kawasaki Environment Person of Merit Recognition	City of Kawasaki Environment Person of Merit Recognition
November	1999	The 34th Machine Promotion Association Award	Machine Promotion Association
November	1999	The 3rd Environment Report Award "Outstanding Performance Award)	Environment Agency, Mainichi Shinbun, Nihon Keizai Shinbun
November	1999	Letter of Appreciation on Appropriate Waste Disposal	Governor of Oita Prefecture
November	1999	Chevalier dans l'Ordre National du Merite	Government of France
December	1999	Excellent Export Company of Environmental Preservation Promotion Award (Canon Dalian Business Machines)	China Economic Department Management Section

Canon Environmental Report–The Locations of the Plants and Offices Surveyed

1. Duration of report: This report is compiled based on data collected in 1999. Canon plans to issue the report annually.
2. Operational sites surveyed: Canon Inc. operations (15 sites) Canon Sales Inc.(1 site), domestic manufacturing subsidiaries (27 sites), overseas sales subsidiaries (23 sites), overseas manufacturing subsidiaries (16 sites)
* data of overseas sales subsidiaries are only products recycling and ISO Licensed
3. Areas covered: Environmental aspects of business operations (Data concerning products is available on environmental labels.)

Japan	
Name	Location
Canon Inc.	
Headquarters	Tokyo
Meguro Office	Tokyo
Tamagawa Plant	Kanagawa
Kosugi Office	Kanagawa
Hiratsuka Development Center	Kanagawa
Ayase Office	Kanagawa
Fuji-Susono Research Park	Shizuoka
Canon Research Center	Kanagawa
Ecology Research & Development Center	Kyoto
Utsunomiya Plant	Tochigi
Toride Plant	Ibaraki
Ami Plant	Ibaraki
Fukushima Plant	Fukushima
Ueno Chemical Products Plant	Mie
Utsunomiya Optical Products Operations	Tochigi
Domestic Sales Subsidiaries	
Canon Sales Co., Inc. Makuhari Headquarters	Chiba
Domestic Manufacturing Subsidiaries	
Canon Electronics Inc. Headquarters, Kagemori Plant	Saitama
Canon Electronics Yamada Plant	Saitama
Canon Electronics Misato Plant	Saitama
Canon Electronics Yokose Plant	Saitama
Canon Electronics Akagi Plant	Gunma
Copyer Co., Ltd. Headquarters	Tokyo
Copyer Tachikawa Plant	Tokyo
Copyer Kofu Office	Yamanashi
Copyer Fukui Office	Fukui
Canon Precision Inc.	Tokyo
Hanawa Seiki, Inc.	Fukushima
Hirosaki Seiki Headquarters & Ishiwatari Plant	Aomori
Hirosaki Seiki Kitawatoku Plant	Aomori
Canon Chemicals Inc. Headquarters & Tsukuba Plant	Ibaraki
Canon Chemicals Iwama Plant	Ibaraki
Canon Chemicals Ishige Plant	Ibaraki
Canon Chemicals Totsuka Plant	Kanagawa
Oita Canon Inc.	Oita
Canon Aptex Inc. Ibaraki Headquarters	Ibaraki
Canon Aptex Shimomaruko Office	Tokyo
Miyazaki Daishin Canon Co., Ltd.	Miyazaki
Optron, Inc.	Ibaraki
Canon Components, Inc.	Saitama
Nagahama Canon Inc.	Shiga
Oita Canon Materials Inc.	Oita
Nippon Typewriter Iwai Plant	Ibaraki
Nippon Typewriter Saitama Plant	Saitama

Overseas	
Name	Location
Overseas Manufacturing Subsidiaries	
Canon Business Machines, Inc.	U.S.A.
Canon Business Machines de México, S.A. de C.V.	Mexico
Canon Virginia, Inc.	U.S.A.
South Tech, Inc.	U.S.A.
Custom Integrated Technology, Inc.	U.S.A.
Industrial Resource Technologies, Inc.	U.S.A.
C.S.Polymer, Inc.	U.S.A.
Canon Giessen GmbH	Germany
Canon Bretagne S.A.	France
Canon Manufacturing U.K. Ltd.	United Kingdom
Canon Inc., Taiwan	Taiwan
Canon Opto (Malaysia) Sdn. Bhd.	Malaysia
Canon Hi-Tech(Thailand) Ltd.	Thailand
Canon Engineering (Thailand) Ltd.	Thailand
Canon Dalian Business Machines, Inc.	China
Canon Zhuhai, Inc.	China
Overseas Marketing Subsidiaries	
Canon U.S.A., Inc.	U.S.A.
Canon Canada, Inc.	Canada
Astro Business Solutions, Inc.	U.S.A.
Ambassador Business Solutions, Inc.	U.S.A.
Affiliated Business Solutions, Inc.	U.S.A.
Canon Computer Systems, Inc.	U.S.A.
Canon Latin America, Inc.	U.S.A.
Canon Panama, S.A.	Panama
Canon do Brasil Industria e Comercio Limitada	Brazil
Canon Chile, S.A.	Chile
Canon Mexicana, S.de R.L.de C.V.	Mexico
Canon Europa N.V.	Netherlands
Canon U.K. Ltd.	United Kingdom
Canon Deutschland GmbH	Germany
Canon France S.A.	France
Canon Italia S.p.A.	Italy
Canon (Schweiz) AG	Switzerland
Canon Espana S.A.	Spain
Canon Svenska AB	Sweden
Canon Norge A.S.	Norway
Canon Singapore Pte. Ltd.	Singapore
Canon Marketing Services Pte. Ltd.	Singapore
Canon Hongkong Co., Ltd.	Hong Kong

Chronology of Environment Assurance Activities

	Issue/Trend	Organization	Canon's Response
			Activities
1960	Pollution Countermeasures Basic Law Air Pollution Prevention Law & Noise Regulation Law OECD Becomes involved in acid rain issue		
1970	Love Canal Incident Water Pollution Prevention Law & Waste Disposal and Refuse Collection Law Offensive Odor Control Law United Nations Human Environment Council United Nations Environment Program (UNEP) begins Chemical Examination Law Six Chromium Pollution Issue London Dumping Convention on ocean dumping Washington and Ramsar conventions Seveso explosion	Establishment of Central Pollution Prevention Committee	Pollution Prevention Management Standards enacted
1980	Superfund Act Convention on Long-Range Transboundary Air Pollution (acid rain) OECD Report on Transfrontier Movement of Hazardous Wastes Ozone Hole Report Chernobyl accident Rhine River pollution incident Montreal Protocol Vienna Treaty (ozone level protection) Exxon Valdez Oil Spill (ocean pollution) Helsinki Declaration on abolition of CFCs	Establishment of Fluorocarbon Countermeasure Committee	Establishment of standards on disposal of specific types of brominated flame-retardant plastic material waste
1990	Action Plan for the Prevention of Global Warming Law for the Promotion of Recyclable Resources German Ordinance on Packaging Control Keidanren Global Environment Charter Voluntary Plan of Environmental Management Global Summit Rio Publicity Agenda 21 BS7750 Basel Convention ISO/TC207 international standardization of environmental management begins Basic Environment Law (Japan) Convention on Biological Diversity Energy Star Program Plan Ozone Labeling Regulations Environmental Basic Plan Treaty for Framework on Climatic Change German Sustainable Economy Law (waste) International ISO 14001 Standards Package Recycling Law Climatic Change Framework Treaty Third Conference of the Parties (COP3) International Summit	Establishment of system to promote environmental assurance Establishment of Waste Countermeasures Committee Completion of Ecology Research & Development Center Establishment of Environment Audit Dept. Environment Assurance Subcommittees Restructured Environment Assurance Promotion Committee Restructured Establishment of Environment Engineering Center Establish of Global Environment Promotion System	Initiation of toner cartridge recycling Start of clean energy operations Establishment of Canon Environmental Charter Creation of Environment Assurance Promotion Plan Initiation of cartridge recycling at Canon Dalian Start of sorting and collection of waste Joint development of lead-free glass Initiation of photocopier remanufacturing activities Initial indication of plastic material qualities Establishment of hazardous glass sludge technologies Eliminate use of fluorocarbons Joint sponsor of UNEP World Environment Photo Contest Voluntary environmental plan determined Beginning of activities at Canon Manufacturing U.K. Initiation of product assessments Eliminate use of trichloroethane Initiate environmental audits Canon Giessen receives EMAS certification Eliminate use of hydrochlorofluorocarbons Receive BS7750 certification (Ami, Ueno, others) Receipt of ISO 14001 (DIS) certification Begin recycling of Bubble Jet cartridges in Japan Establishment of global green purchasing and procurement standards Establishment of intermediate environmental policies and targets for the Canon Group Disclosure of product environment information (Japan's first Type III Eco-Label) Published "Canon Environmental Report 1999" Disclosure of Environment Information on Web site

Mini-Glossary of Environmental Terms

Clean Energy

Clean energy involves hydro, wind, natural gas, solar and other relatively nonpolluting sources of energy. Clean energy sources must be evaluated on an overall level, since some—such as hydrogen gas—are nonpolluting during combustion but can form pollutants during production processes.

Disclosure of Environmental Information

This phrase refers to companies publicly disclosing their environment-related activities, as well as the burden that they place on the environment, by including environmental information related to eco-management and products. Residents in nearby areas, consumers, shareholders and others can use such information to ascertain environmental responses. Consequently, such information should be as comprehensive and quantitative as possible.

Eco-Design

Ecological design is phasing out the use of hazardous chemicals and aims for long product life, as well as design for easy disassembly, reuse and disposal of parts. The goal of eco-design is to produce products and packaging that take account of the environment. Eco-design is sometimes also described as environmentally conscious design or environmentally harmonious design.

Eco-Labels

Eco-labels are used to identify products that place a relatively small burden on the environment. The eco-mark authorized by the Japan Environmental Association is one such symbol. Others include the Blue Angel and the Energy Star. In addition to this third-party certification, the International Organization for Standardization (ISO) is considering the adoption of voluntary labeling and indicating quantitative environmental burdens.

ECP Design

Environmentally Conscious Product (ECP) design calls for the nearly complete determination of a product's environmental impact from the planning, development and design stages. In order to minimize the environmental problems that products can cause and help bring about a recycling society, manufacturers must begin considering the environmental implications of products as far upstream as possible. Manufacturers must recycle resources as efficiently and rationally as possible while increasing product competitiveness.

Environmental Audits

Environmental audits are conducted to evaluate objectively whether a company is conforming to legislated environmental standards, as well as to its own environmental policies and targets. As ISO 14001 certification becomes increasingly prevalent in Japan, the number of companies undergoing environmental audits has risen sharply. At the same time, systems to publicly train and certify environmental auditors have been established.

Environmental Charter

An environmental charter defines a company's fundamental stance on environmental issues, and indicates specific actions. Two such charters—the Industry Charter of the International Chamber of Commerce and Keidanren's (The Federation of Economic Organizations) Environmental Charter—are particularly well known. The latter charter identifies 24 environmental guidelines spanning 11 industries.

Environmental Hormones

Endocrine disruptors, sometimes known as environmental hormones, are similar to natural hormones but always affect our bodies negatively. The mechanism by which environmental hormones operate is unclear. Unusually high levels of environmental hormones have been found in alligators and shellfish.

Greenhouse Gases

Greenhouse gases absorb infrared rays that reflect off bodies of land and water, inhibiting their escape from the Earth's atmosphere. At the COP3 meeting in Kyoto in 1997, six greenhouse gases—CO₂, methane, nitrous oxide, HFCs, PFCs and SF₆—were singled out for reduction efforts.

Green Procurement and Purchasing

This concept calls for the preferential procurement and purchase of items that place less of a burden on the environment. The establishment in Japan of a Green Purchasing Network has caused a rapid expansion of these activities. The Green Procurement of materials and parts is essential for manufacturers that seek to reduce the environmental impact of their products.

ISO 14000

ISO 14000 is a series of environmental management standards promulgated by the International Organization for Standardization (ISO). These standards comprise environmental management systems, environmental audits, environmental labeling and environmental performance assessments, as well as LCA and the use of specific terminology and definitions. The certification under one standard in this series, the ISO 14001 environmental management system, is becoming an increasingly common prerequisite to business in Europe and other regions.

LCA

Life Cycle Assessment or Analysis is an objective, quantitative method for evaluating the impact of a product on the environment through its entire life cycle: from raw materials to production, distribution, consumption and finally disposal or recycling. There is an awareness of the need for standardized methodology, but full agreement has not yet been reached.

Material Safety Data Sheet

The Material Safety Data Sheet describes chemicals. Such information is necessary for the people who use these chemicals because it informs them about environmental and health implications, as well as details on their safe use. Generally, Material Safety Data Sheets are created by the people who produce chemical products, and are then provided to users. In June

1990, the International Labor Organization adapted international standards for Material Data Safety Sheets in the Convention Concerning Safety in the Use of Chemicals at Work.

Product Environment Assessment

The impact a product will exert on the environment throughout its entire life is assessed at the product development stage, and features are incorporated into the product to reduce this burden. In Japan, product environment assessments are mandatory for certain products designated under the Recycling Law. Many companies also voluntarily conduct such assessments for other products.

PRTR

The Pollutant Release and Transfer Register is part of a system in which companies notify authorities of environmentally polluting emissions, and of pollutant transfer amounts. "Law in connection with the Emission of Certain Chemical Substances to the Environment and Promotion of Improvement on Management" which was proclaimed on July 13, 1999 sets its enforcement. The result of emissions for one year from April 2001 will be reported after April 2002 as the first report enforced by this law.

Recycling Society

This phrase describes a new type of economic society that makes effective use of limited natural resources and aims to minimize society's burden on the environment. By contrast, the current system involves mass consumption and mass wastage. A recycling society, which involves an Environmental Basic Plan founded on Japan's Environmental Basic Law, has been proposed as an ideal for the 21st century.

Remanufacturing

Remanufacturing involves the collection of parts from used products for reuse in the manufacturing of new products. Remanufacturing places less of a burden on the environment than turning parts back into raw materials for input into the manufacturing system. Quality remanufactured products must be as reliable as new products.

Venous Industries

While manufacturing and sales are described as arterial industries, those industries involved with the collection, resource recovery, recycling and processing of production emissions and used final products can be called venous industries. Companies that recover resources and process waste fall under this category.

Voluntary Plans

Japan's Ministry of International Trade and Industry (MITI) calls for companies to clearly define their environmental policies and present them for evaluation through industrial associations and other affiliated organizations. In 1994, MITI began encouraging companies to submit plans every three years covering management policies, internal systems, in-house regulations, environmental audits, environmentally conscious operating activities, training courses and contingency plans.

We Want to Hear from You

This report is a compilation of environment-related data of Canon's operations in 1999. We would very much like to hear from you to make it an environmental report of higher quality. Please let us know your opinions and suggestions regarding the report. We would very much like to reflect them in our next issue. Please fax or mail us the form on the reserve side of this page. This form can also be found on the Canon Inc.'s Web site.

Mail: Environment Engineering Center Canon Inc. 30-2 Shimomaruko 3-chome, Ohta-ku, Tokyo 146-8501, Japan

Fax: +81-3-3757-8208 **Web site:** URL: <http://www.canon.com/environment/>

Q1 What did you think of this report (please circle one)?

1. Was it easy to read? **Very easy** **Easy** **Average** **Difficult** **Very difficult**

Comments

2. What did you think of the content? **Very easy** **Easy** **Average** **Difficult** **Very difficult**

Comments

3. What is your evaluation of Canon's environmental activities? **Good** **Relatively good** **Fair** **Relatively poor** **Poor**

Comments

4. Was there anything that was not explained sufficiently or needs to be improved? Please give us your suggestions.

a. **Sufficient information was provided** b. **Needs improvement (please specify)**

Q2 What would you expect from Canon regarding environmental issues?

Q3 Which of the following best describes you?

a. **Involved in finance/investment** b. **Ranking institute** c. **Public administration** d. **Resident near a Canon operational site**
e. **Canon client/vendor** f. **Environmental specialist** g. **Press** h. **Environmental department of corporation** i. **Student** j. **Product user**
k. **Other (please specify)** ()

Q4 How did you learn about this publication?

a. **Newspaper** b. **Magazine** c. **Canon dealer** d. **Canon salesperson** e. **Canon homepage** f. **Environmental or other seminars**
g. **Other (please specify)** ()

Thank you for your cooperation

Name _____ Age _____

Address _____

Occupation/Company _____ Title _____

Telephone _____ Fax _____ E-mail _____

Canon

Environment Engineering Center

30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo 146-8501, Japan

Worldwide Network Home Page: <http://www.canon.com/environment/>

Published: July 2000



Canon