Helping customers achieve more effective environment management
At Fuji Xerox, “Green Products,” which are designed to reduce environmental impact, have 17 environmental performance criteria such as energy and resource savings. We aim to help customers achieve more effective environmental management with green products.

Reduction of environmental impact throughout the product lifecycle
We try to reduce environmental impact at each stage of the product lifecycle such as product Planning/Development, Production, Use and Collection/Recycling.

For more detailed information concerning each stage, see the pages listed below.

Product Planning & Development
"Planning and Development of Green Products" (p. 9)
Development and Design System (p. 9)
Policy Regarding Environmental Labels and Certification (p. 10)
"Environmental Technologies Development" (p. 11)
Energy Savings (p. 11)
Saving Resources / Recycling Resources (p. 13)
Reducing Harmful Chemicals (p. 14)
Improving Products More Comfortable for the Office Environment (p. 14)

Material procurement
"Green Procurement" (p. 15)

Production
"Green Factory" section (from p. 26)

Packing & Shipping
"Packaging and Delivery" (p. 16)
Packaging Improvement (p. 16)
Logistics Improvement (p. 17)

Use
"Environmental Technologies Development" section (from p. 11)

Collection & Recycling
"Resource Recycling System" section (from p. 18)
Planning and Development of Green Products

Fuji Xerox continually improves the environmental performance of products. To ensure that the green product concept is realized into the planning and development stage, we have strict internal standards. We continue to produce better green products by enforcing these standards and improving farther.

Goals

- Satisfy with requirements for all major environmental labels.
- Strengthen and continually improve systems for planning and development to make the excellent green products.

Results

Development and Design System

At Fuji Xerox the creation of highly efficient green products begins at the planning stage, wherein development targets are set. A new product is only released to the market after it has achieved these target specifications. Our products must, at the least, meet the minimum legal requirements. We also set our own standards of excellence, in consideration of the published standards for major environmental labels,* regulations and market trends. Not only do our products conform with our own stringent standards, the specifications are targeted for further improvement via midterm plans. Committed to complete lifecycle design, we also strongly emphasize the reusability of parts.

We implement green design according to guidelines and data. In addition to evaluating the excellence of product design, we carry out stringent final checks to ensure that the environmental performance of our green products conforms to expectations.

Our company information system supports the people involved in the development process. Using an intranet, authorized personnel have convenient access to all the standards, guidelines, information and data they need.

To ensure that the latest intelligence and technology are shared and embodied in products under development, the Internal Standardization Committee regularly meets to review standards and guidelines.

* To enable consumers to make informed decisions, an environmental label is a mark awarded by a monitoring group on behalf of products demonstrating excellent environmental performance.

Green Product Development Process

![Green Product Development Process Diagram]
Policy Regarding Environmental Labels and Certification

♦ Eco Mark
The Eco Mark*1 standards (No. 117) for copiers were released in November of 1999. These standards, which are very similar to those of the German Blue Angel mark,*2 take into account environmental impact from manufacturing to final disposal. In principle, all new models of Fuji Xerox copiers and multifunction copiers are designed to meet Eco Mark standards. As of the end of FY 2000, certification had been acquired for 61 models*3 from 10 product series.
The DocuColor 1250 Series was the industry’s first color copier/multifunction copier to receive the Eco Mark.

*1 The Eco Mark is an environmental labeling system that was introduced by the Japan Environment Association in 1989.
*2 The Blue Angel Mark is a system of environmental labeling instituted by the Federal Environment Agency of Germany.

♦ International Energy Star Program
The Energy Star Program* rates the energy-efficiency of office equipment, especially copiers and printers. Standby-mode energy efficiency is particularly important, given that 70% of the overall energy consumed can be wasted when the devices are not actually in use.
All applicable Fuji Xerox products conform to the low standby energy-consumption criteria specified by the International Energy Star program.
In FY 2000, with 56*4 of our models conforming, for all the units sold that year, the rate of conformance was 97%.

* The International Energy Star Program, which awards environmental labels to energy-efficient products, is run with the participation of various national governments.

♦ Fuji Xerox Resource-Recycling Product Label
To ensure the effectiveness of the company’s "Collection System," "Reusable Parts and Resources Program," "Production Process" and "Design for Recycling," applying 17 different categories of criteria, we have set our own stringent internal standards for the basic evaluation of products. Models that meet these standards are marked with a Resource-Recycling Product Label*5, and detailed results of the evaluation are published. Fuji Xerox launched the system in 1999, and by FY 2000 a total of 37 models had received its Labels.

*5 Information about our Resource-Recycling Product Label Qualification Standards and Products Qualifying for the Resource-Recycling Product Label are shown on page 56.
To create excellent green products, it’s necessary to develop superior environmental technologies. Fuji Xerox has been actively pursuing the technological development of environmental characteristics, including energy savings. Our approach to the environment, along with our advanced knowledge and environmental expertise, is embodied in green products that bring lasting benefits to our customers.

**Goals**
- Launch the new products with the excellent energy-saving technologies, which are newly developed.
- Reduce resource consumption and ensure a comfortable operating environment by developing technologies to make our products safe and easy to use.
- Cut the use of harmful chemical substances from our products such as lead, chrome and halogen-based fire retardants.

**Energy Savings**

**Downward Trend in Copier and Multifunction Copier Energy Consumption**

The graph on the right, taking the value for 1995 as base 100, shows how we have managed to cut the energy consumed, on a per-unit basis, by the copiers and multifunction copiers we have sold and that are in actual use.

As well as increasing the number of products that incorporate our advanced energy-saving technology, we have also annually decreased the amount of energy consumed per unit. In FY 2000 energy consumption was just 78% of the FY 1995 level.

In FY 2000, owing to the successful effort to further improve our environmental technology, we released products that are even more energy-efficient. These products are effectively cutting the overall energy consumption of products used in the market.

The graph shows data for copiers and multifunction copiers. Because our digital copiers use the same print technology, however, the expertise we've developed is saving energy in both conventional and new equipment.

On the next page you can get an idea of the technologies we're using to cut energy consumption.

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**Method for calculating total energy consumption**

Total amount of electricity consumed (Wh/year - unit)

\[ \sum \text{total energy consumption per product (Wh/year)} \]

\[ \sum \text{number of units in operation per model (units)} \]

Total energy consumption per product (Wh/year) =

\[ \text{per-unit amount of energy consumed by each product (Wh/year - unit)} \times \text{number of units in operation (units)} \]

Amount of energy consumed per unit (Wh/year) =

energy-conservation efficiency*1 (Wh/h) \times 8 (h/day) \times 240 (days/year)

Energy-conservation efficiency:

Energy-conservation efficiency value based on the Energy Conservation Law (abbreviated title)*2

(For multifunction copiers the ordinary copier value is used.)

**Units included in calculation**

Copiers and multifunction copiers sold after 1991

*1 Method for calculating energy-efficiency:

\[ E = (A + 7 \times B) \div 8 \]

E: value for energy-efficiency

A: Energy used after switching on the device to make a fixed number of copies in an hour

B: Energy used to make a fixed number of copies in an hour after the initial hour when measurements from “A” were taken

*2 The Energy Conservation Law is a Japanese law concerned with rationalizing the use of energy.
Energy Savings

**Energy-Saving Technology and Products**
Fuji Xerox received the commendation for the DocuPrint C2220 from the chairman of the Energy-Conservation Center (Energy Conservation Prize) for the second consecutive year. Last year Fuji Xerox received The Energy Conservation Prize for the DocuColor 1250 series. The DocuPrint C2220 color laser printer, launched in December 2000, prints fast. But in addition to its blazing speed, it warms up in only 45 seconds and consumes only 5 watts in sleep mode. Below you can read about the main feature of the award-winning, energy-saving technology we developed in the fuser mechanism and controller.

**<Saving Energy with the Fusing Mechanism>**
Fuji Xerox developed a free-belt nip-fusing method to fuse toner to paper drawn between the heat roll and an endless belt. Compared with conventional methods that use upper and lower rollers for fusing, a greater area of paper comes into contact with the heat roll during the process of printing. This makes heat-transfer much more efficient. In addition to raising the printing speed, it has also resulted in more compact equipment. Shrinking the warm-up period from 300 seconds to 45 seconds, this technology has enabled a time reduction of 85% (company data).

**<Saving Energy with the Controller>**
We developed a CPU chip to control the printer. During energy-saving (sleep) mode the chip itself goes into low-consumption mode and keeps only the network functions active. Control circuitry on the chip ensures that all other circuits are switched off. Not only is the power used by the rest of the printer strictly controlled by the CPU, the amount of power needed in sleep mode by the CPU itself has been significantly reduced, down to less than 3 watts. Additionally, to cut waste during sleep mode, we’ve implemented energy-saving technology in the power-supply unit. Our new, highly energy-efficient power supply means that, at 5 watts, the total power requirement in sleep mode is one of the lowest in the world. The excellent technology we’ve developed has enabled us to achieve this standby power requirement of 5 watts, well below the 70-watt ceiling for sleep mode required by the revised Energy Star standards of November 11, 2000.
Saving Resources / Recycling Resources

♦ Design for Reuse and Recycling
To minimize the input of new resources, Fuji Xerox designs products with parts that can be reused and recycled in order for the used materials to circulate in the Closed-Loop System. You can read more about this concept in the next section, “Resource Recycling System.”

♦ Reducing the consumption of toner
Fuji Xerox has come out with a magnetic carrier and pigment toner with particles approximately six microns in diameter, the world’s smallest. Using finer particles than are found in conventional toner (approx. 7µm) means that 10% less toner is needed.

By using a novel polyester resin to engineer the right balance of granularity and adhesion, the company has also managed to achieve a fusion temperature that’s 20°C lower than that of conventional toner. This development has allowed us to produce equipment that prints faster and reduces energy consumption. We are now studying the feasibility of using the new toner with a number of future products.

♦ Effective utilization of waste paper pulp
~ Birth of recycled colored paper ~

The Fuji Xerox Group has been working jointly with a paper manufacturer to advance the creation of products that are less detrimental to the environment. In particular, we’ve been actively promoting cutting the amount of waste generated by making more effective use of waste paper. To push things along, we’ve initiated a project to encourage the use of more recycled-paper pulp.

Our activities have involved attempts to use recycled paper in the pulping mixtures used for every type of copier paper the Fuji Xerox Group handles, including paper cut to size for printing. When the project began in the fall of 1997, the overall proportion was 27%, but by December of 1999 that figure had increased to 44.7%.

In the year 2000, as part of our continuing effort to increase the use of waste paper, we developed and marketed two types of copier paper: "C2r (Cee 2 R)" and "Recycle Color Paper 100." For color or monochrome printing and made from 70% recycled-paper pulp, "C2r" is a new form of environmental paper that is intended for recycling. Meanwhile, with "Recycle Color Paper 100" we have become the first in the world to market colored copier or printer paper made from 100% recycled-paper pulp.

Efforts such as this have helped increase the proportion of recycled-paper pulp used in Fuji Xerox copier and printer papers by a factor of 2.5 points from the 1999 figure, bringing the figure to 47.2% in December 2000.

For more information, see "Reuse and Recycling Design" on page 20.

<table>
<thead>
<tr>
<th>Year of introduction</th>
<th>Toner diameter (µm)</th>
<th>Toner consumption (mg/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>7</td>
<td>42.0</td>
</tr>
<tr>
<td>1996</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td>1997</td>
<td>5</td>
<td>33.0</td>
</tr>
<tr>
<td>1998</td>
<td>4</td>
<td>26.0</td>
</tr>
<tr>
<td>1999</td>
<td>3</td>
<td>19.0</td>
</tr>
<tr>
<td>2000</td>
<td>2</td>
<td>12.0</td>
</tr>
</tbody>
</table>

"Recycle Color Paper 100" is made entirely from recycled paper pulp.

Proportion of recycled-paper pulp used in paper in printer and data sector (source: Fuji Xerox data)
Environmental Technologies Development

Reducing Harmful Chemicals

Reflecting our concern for the environment, during product development Fuji Xerox tries to reduce as less amount and number of potentially harmful chemicals as possible that are used in production. You can read more about how we do this in the next section, "Resource Recycling System."

*For more information, see "Reducing the use of toxic chemicals" on page 22.

Improving Products More Comfortable for the Office Environment

To avoid harm to the customer’s immediate environment, Fuji Xerox takes great care to minimize the generated of noise and ozone.

♦ Ozone emissions
With the DocuPrint C2220 we introduced the ozone-free technology that has reduced ozone generation to almost zero.

♦ Noise
Moreover, by cutting the amount of electricity used and optimizing the thermal diffusion of heated parts, designs can also use cooling fans with lower output. This greatly reduces noise during standby mode. As a result we’ve held the DocuPrint C2220’s noise output to a remarkably low level, making it noticeably quieter than units made by other companies.

Our DocuColor 1250 multifunction color copier not only prints faster (50 rather than 36 cpm at the monochrome copy speed) than the previous A Color 936 copier, we have also managed to keep noise levels from rising much above 3 dB. During operation the drive and paper-feed mechanisms also operate quietly. This and other features have earned the Eco Mark for the DocuColor 1250, making it the first color copier to do so.

We also carry out ongoing research to reduce noise and evaluate its causes. Continuing to work toward ever-quieter operation, we have an active program of research and development.

<table>
<thead>
<tr>
<th>DocuPrint C2220</th>
<th>Acoustic measurement chamber</th>
</tr>
</thead>
</table>

### Noise levels in standby mode

*Acoustic power level: The values for the amount of acoustic energy emanating from equipment are calculated as 15 dB above the noise levels normally shown in catalogs and elsewhere. In other words, the acoustic power level = noise level + 15 dB.*
Green Procurement

Our products are manufactured with parts procured from suppliers. Therefore, we cannot make our green products without cooperation with them. We request our suppliers to introduce environmental management system, because we ask their parts and manufacturing process to reduce environmental impact. In addition, we try to enforce the recycling procurement activity aiming at reuse and recycling of parts.

Goals

- Encourage our suppliers as one of our environmental management activities through our environmental assessment and support.
- Enforce all suppliers compliance with the 1999 Fuji Xerox "Green Procurement Guidelines" and "Recycling Procurement Guidelines."

Results

Enhanced Environmental Management System Among Suppliers

To ensure that the materials and parts we procure have minimal environmental impact, we prefer to obtain supplies from facilities that have received ISO14001 certification. This policy has encouraged a growing proportion of the large-scale facilities that supply us to work toward and receive certification. Additionally, we continue to promote the more complete compliance of suppliers with our own advanced environmental management standards.

Provision of Guidelines

◆ Green Procurement Guidelines
Our "Green Procurement Guidelines" booklet informs suppliers as to how, according to our own standards for the control of harmful chemicals, we expect them to reduce harmful chemicals in both the parts we procure and the processes used to produce them.
We ask suppliers to join us in going beyond domestic legal requirements by replacing harmful substances with substitute materials as they become available.

◆ Guidelines for Recycling Procurement
We have issued our "Recycling Procurement Guidelines" booklet to encourage suppliers to share our determination to recycle parts and materials. The publication is a recycling design manual that details each aspect of practical recycling that should be considered in the design of component parts.
Packaging and Delivery

We commit to promote 100% resource-recycling. Based on this commitment, we are also implementing 3Rs (reduce, reuse, recycle) in packaging and delivery.

Goals

- Improve the packaging and delivery of products with quantitative environmental evaluations.
- Implement low cost recycling of "EPS" (Expanded Polystyrene) use as one of packaging materials.
- Reduce the number of vehicles by improving the delivery systems.

Results

Packaging Improvement

◆ Lifecycle Assessment of Packaging Materials
For the major packaging materials the company uses, Fuji Xerox employs lifecycle assessment (LCA)* to quantify, in terms of unit emissions of CO2, NOx and SOx, the harm caused to the environment. LCA is helping us shift to package design and packaging materials having less environmental impact.

*LCA is a method for comprehensively analyzing and evaluating the overall environmental impact of materials used in a product throughout its lifecycle, from manufacturing to use and ultimate disposal.

◆ "Zero Carry" helping to cut the amount of packaging materials
To cut down on the amount of materials used for large and midsize copiers during transportation between our major warehouses, beginning in 2000 we began using "Zero Carry" air-cushion shielding for our three main midsize products. "Zero carry," by contrast with conventional materials, can be reused more than 50 times and still deliver a sufficient level of protection. Now we are considering to extend its use to deliver to the customer. We estimate that this new way of protecting products in transportation has cut by half the amount of packaging materials we use for our three main midsize products.

"Zero Carry" shielding
♦ Recycling Protective Materials for Toner Cartridges
We collect the EPS (expanded polystyrene) protective packaging material for toner cartridges and bring it back to the factory. We used to dissolve these materials and recycle them for use in different applications. Because beads made from recycled EPS were actually more expensive than new materials, we conducted technical research in order to achieve a further reduction in environmental impact. In the year 2000 we succeeded in establishing a disintegration/recombination technology that enables us to recycle EPS as a cost-effective packing material. Using this innovative method of disintegrating the EPS and recombining the beads, in FY 2001 we began shipping toner cartridges in protective packaging made from recycled EPS.

♦ Reusable Cartons Mean Less Shipping Material
In the past, when shipping spare parts we would use a cardboard carton for each part, which then had to be disposed of at the place of installation. But through the introduction of special collapsible plastic cartons in May 2000, we’ve saved 10 t of cardboard cartons. Furthermore, for shipping consumables to convenience stores operating copiers, we designed and introduced a special box. Now, instead of receiving consumables in multiple regular deliveries, the store can get a full set in a single drop-off. This has saved 9.7 t of shipping cartons and, because separate deliveries of each kind of item are no longer needed, the number of trips has been cut to about one-fourth the old requirement.

Logistics Improvement

♦ More Efficient Use of Transportation
To reduce the number of vehicles needed for the delivery of consumables, paper trays and other parts for copiers and printers, we reorganized shipping within the 23 wards comprising central Tokyo. By consolidating partial deliveries and special deliveries, we introduced a shipping system on consolidation optimized by area. Thus we succeeded in reducing the number of delivery vehicles by 12%.