

## Energy Conservation (Products)

### Goals and Progress

- **Promotion of Energy Conservation**  
Thirty percent reduction in per product energy consumption by the end of fiscal 2001, compared with that in fiscal 1996
- ▶ In fiscal 1998, energy consumption for hybrid machines and copiers reached 113%, compared to fiscal 1996, due an increased ratio of hybrid machines of greater energy consumption. On the other hand, energy consumption for facsimiles has decreased to 87%.

#### ● Efficient Use of Paper

We are promoting the efficient use of paper, which discharges a significant amount of CO<sub>2</sub> at production, with the improved speed of duplex copiers as well as various paper types, including recycled paper.

- ▶ Copiers marketed in fiscal 1998 achieved a 90.5% increase in speed on average for duplex copying.\* All the machines can use recycled paper.

\* Duplex productivity = duplex copy speed (per page)/simplex copy speed (per page) × 100

### ◎ Concept of Conserving Energy on Products

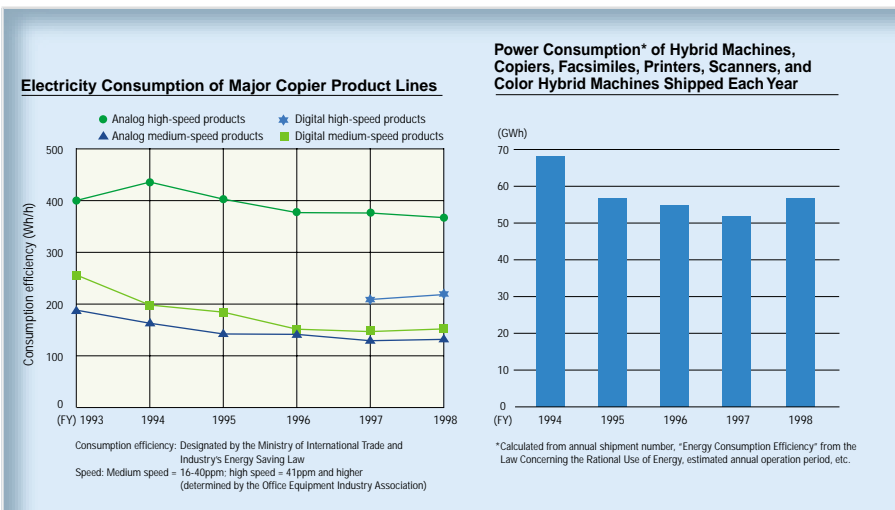
The purpose of environmental conservation is to reduce total environmental impact. The Ricoh Group, whose businesses include global product lines of OA equipment, such as copiers, facsimiles, and printers, is developing advanced energy conservation technologies as well as reducing the total amount of environmental impact caused by our products through using such equipment. Since much CO<sub>2</sub> is given off during the manufacturing process, we also consider the efficient use of paper to be included in the conservation of energy, and we are increasing the performance of duplex copiers.

### Ricoh Corporation Receives International Energy Star Prize for Fourth Consecutive Year

Ricoh Corporation, a U.S. subsidiary, has won the International Energy Star Prize for four consecutive years since the prize was first given out in 1996. We have also obtained International



Energy Star certification for all products made since the system was implemented on January 1, 1995.



### Reducing Electricity Consumption of Copiers and Printers

The development of energy conservation in copiers and printers can be summarized as the history of increasing the heat efficiency ratio. As copiers and facsimiles transfer the toner from the thermal drum to the paper and then heat the paper so that the toner does not rub off the paper, a considerable amount of electricity is used in the process. Ricoh is not only developing toner transfer technology but also increasing energy efficiency by installing appropriate wattage heaters for some products to improve performance and electricity consumption.

### Idling Mode Energy Conservation Technology for Facsimiles

Generally speaking, all ordinary facsimiles used to be on permanent idling, or standby mode. Energy consumption during idling of Ricoh's RIFAX BL110 facsimile has been cut 95% from the 30 W consumption of previous Ricoh facsimiles with the aid of an energy-conserving CPU developed in-house that consumes approximately 1.4 W<sup>1</sup>. There are now more than 400,000 facsimiles equipped with this technology operating around the world, and the total amount of energy thus saved<sup>2</sup> is calculated to be equivalent to the annual energy consumption of 150,000 households in Tokyo. Taking this enormous energy-saving effect into account, the RIFAX BL110 was awarded the Chairman's Prize of the Japan Machinery Industry Association, Outstanding Energy Conservation Device Award, for fiscal 1997.

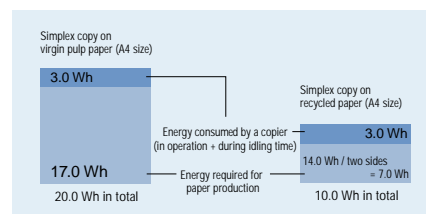
1. In energy-conserving idling mode
2. Calculated with a five-year average life of the product



RIFAX BL110

### Improved Duplex Copying to Respond to Global Warming

Copying generates CO<sub>2</sub>. Annual copier paper consumption in Japan is about 776,000 tons<sup>1</sup>, equivalent to 2,328,000 tons of CO<sub>2</sub><sup>2</sup>. These figures cannot be ignored from the viewpoint of global warming. If you copy on virgin pulp paper, about 20 Wh<sup>3</sup> is consumed per page, including the energy to manufacture the paper. On the other hand, 100%-recycled paper reduces CO<sub>2</sub> generated during production. And duplex

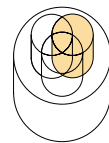


copying further reduces environmental impact by about half. Due to improved technologies, including Ricoh's paper feed method, the imagio MF 6550 has achieved high-speed duplex copying of 60 pages per minute<sup>4</sup>. Machine operation is made easy as well to facilitate use by as many people as possible.



imagio MF 6550

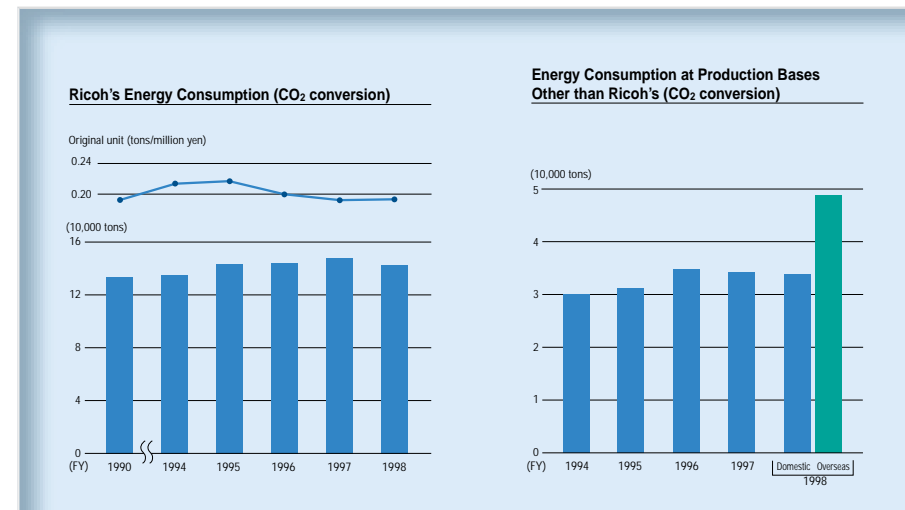
1. Source: Paper and Pulp Statistical Table, Ministry of International Trade and Industry.
2. Source: Ricoh's LCA examples announced at the 1997 meeting of the Japan Electrophotography Society (see page 14).
3. Calculated with specified machines under certain conditions; numerical values may be subject to change by machine type or conditions.
4. For simplex copying, 65 pages per minute for A4-sized paper (lengthwise)



## Energy Conservation (Business Sites)

### Goals and Progress

- Reduce CO<sub>2</sub> emissions by at least 15% by the end of fiscal 2001 on a per sales volume basis, compared with those in fiscal 1990.
- (Domestic and overseas production sites other than Ricoh's have set numeric goals of 15% or more each.)
- ▶ Ricoh's CO<sub>2</sub> emissions measured by sales unit for fiscal 1998 were 100.5%. We are promoting energy conservation activities to achieve our goal of 15% reduction.



### ◎ Concept of Energy Conservation at Business Sites

Considering energy as a resource, our aim is to yield the maximum effect with the minimum energy input to achieve the efficient use of energy.

### Energy Conservation in Compressors

Many production sites of the Ricoh Group use compressed air to power devices on production lines. At Ricoh Fukui, a duct is attached to the air compressor to suck in the cooler outside air to reduce electricity usage.

### Heat Insulated Roofs in Factories

At Ricoh Unitechno Co., Ltd., energy consumption for air-conditioning is reduced by installing insulators on the factory roof.

### Introducing Eco-Ice

Eco-ice is the practice of making ice using night-time electricity and storing the negative heat energy to power air-conditioning systems during the day. It is also effective in cutting electricity expenses. Ricoh Unitechno Co., Ltd., and Ricoh Toda have already introduced this system.

### Stopping the Idling of Engines within Grounds

We not only discourage the idling of vehicle engines on our grounds by our employees but also request our visitors and customers to cease the practice as well. This is just one of the specific efforts made at many of our sites to reduce CO<sub>2</sub> emissions.

### Cogeneration Systems

The Ricoh Central Research Center self-generates approximately 50% of the power used daily (800 kWh) with a gas engine type cogeneration system. Since it uses natural gas, CO<sub>2</sub> emissions are low. Also, by using excess heat generated by the ventilation of clean rooms, total energy efficiency has been increased to 80%.



Gas cogeneration system at the Ricoh Central Research Center

### Energy Conservation in Clean Rooms

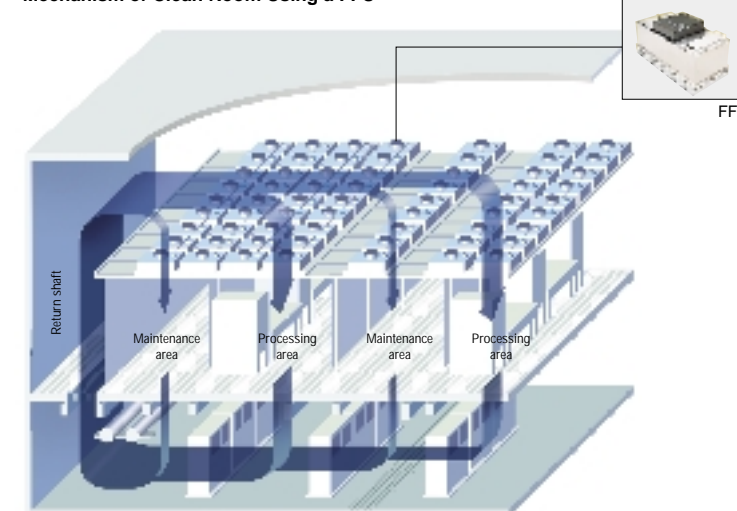
The manufacturing of highly integrated semiconductors requires exceptionally clean rooms. At the Ricoh Yashiro Plant, FFUs (fan filter units) help maintain a class 0.1 degree of cleanliness\*. FFUs also contribute to appropriate spot cleaning as well as reducing energy consumption thanks to their variable density arrangement and because they can be switched on and off independently as necessary.

\* Less than one particle of dust greater than 1/10,000 mm in diameter per 10 ft<sup>2</sup>.



Energy-conserving clean room maintained by FFUs

### Mechanism of Clean Room Using a FFU



FFU