Usage

OA (Office Automation) equipment, including copiers, facsimiles, and printers, requires electric power, and the CO_2 that is emitted while generating that power is a major environmental pollutant. In order to prevent global warming, Ricoh strives to improve not only the energy conservation capabilities of its products but also their usability so that more people will use them, thereby effectively reducing the total environmental impact of the CO_2 emitted.

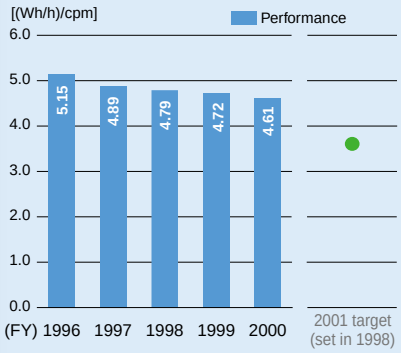
Another important issue is the efficient use of paper. Ricoh is proposing a variety of systems that would reduce paper consumption and use paper more efficiently because a significant amount of energy is required to manufacture paper. Such systems include duplex copying technology.

■ Energy Conservation

It is important for OA equipment, including copiers, to use less energy while in standby mode. Copiers and printers are generally turned on during office hours while facsim-iles turned on 24 hours. Ricoh succeeded in significantly reducing the amount of electric power its Aficio 1035/1045 (imagio Neo 350/450) series, marketed in February 2001, consumes while in standby mode. This success continued in Ricoh's Aficio 1022/1027 (imagio Neo 220/270) series, which was marketed in June 2001.

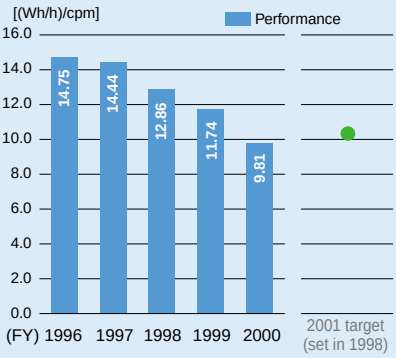
Changes in Energy Consumption of Black-and-White Copiers and Multifunctional Copiers*

Black-and-white plain-paper copiers (PPCs), excluding those that accommodate wider paper



* Negligible reductions in the amount of power consumed by black-and-white copiers and multifunctional copiers were the result of a transition in the market from analog machines to (digital) multifunctional machines that have a higher energy consumption efficiency. We are planning to achieve our goal in fiscal 2001 with the introduction of the Aficio (imagio Neo) series that incorporates quick start-up (QSU) technology.

Changes in Energy Consumption of Color Copiers and Multifunctional Copiers*



* Significant reductions in the amount of power consumed by color copiers and multifunctional copiers are attributed to the large number of Aficio Color 4506 (imagio Color 3100) copiers sold. The Aficio Color 4506 (imagio Color 3100) series has a higher energy consumption efficiency than originally targeted.

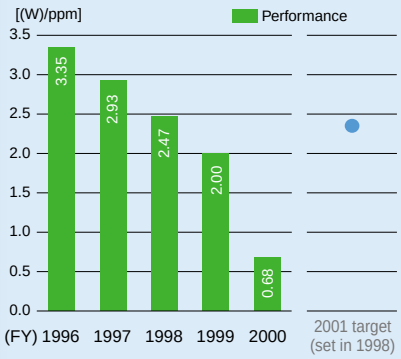
◎ Energy conservation values for copiers are calculated as follows:

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

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

Data for multifunctional black-and-white copiers, color copiers and multifunctional copiers are pursuant to the measurement standard for energy consumption efficiency of the Law Concerning the Rational Use of Energy.

Changes in Energy Consumption of Facsimiles (including multifunctional copiers)*



* The energy conservation capabilities of facsimiles are steadily improving due to the adoption of technology developed for the RIFAX BL110. (See page 37.)

◎ Energy conservation values for facsimiles are calculated as follows:

Σ [<Energy Star energy consumption in standby mode[1] (W)>/<printing speed[2]> × the number of units marketed]/Σ the number of units marketed

1. Energy Star energy consumption in standby mode = energy consumption in standby mode pursuant to the standards of the International Energy Star Program.
2. Printing speed = the number of pages printed per minute (ppm)

* Data for the three graphs above is based on the number of units marketed in Japan.

Energy-Saving, User-Friendly QSU Technology[1] Used in the Aficio (imagio Neo)

To lessen the environmental impact of copiers, it is important to reduce the amount of power they consume while in operation and on standby. Furthermore, the machines should be user-friendly when being brought out of standby mode.

Ricoh developed energy-saving, user-friendly QSU (Quick Start Up) technology and used it in the Aficio 1035/1045 (imagio Neo 350/450) series of multifunctional digital copiers, which it marketed in February 2001. In November 1999, Ricoh's Aficio 1035 (imagio Neo 350) won the first Award of Excellence in the world for its energy-conservation technology. The Aficio 1035 (imagio Neo 350) was entered in the Copier of the Future Division in the Demand-Side Management (DSM) Program[2] of the International Energy Agency (IEA) in November 1999. The copier also received the 2000 Minister of Economy, Trade and Industry's Grand Prize for Energy Conservation[3]. Ricoh is applying QSU technology to the rest of its products and is contributing to the reduction of CO_2 emissions by promoting more efficient means of environmental conservation.

The Minister of Economy, Trade and Industry's Grand Prize for Energy Conservation

IEA's Award of Excellence in the Copier of the Future Division, given in recognition of the Aficio 1035's (imagio Neo 350) energy-conservation technology

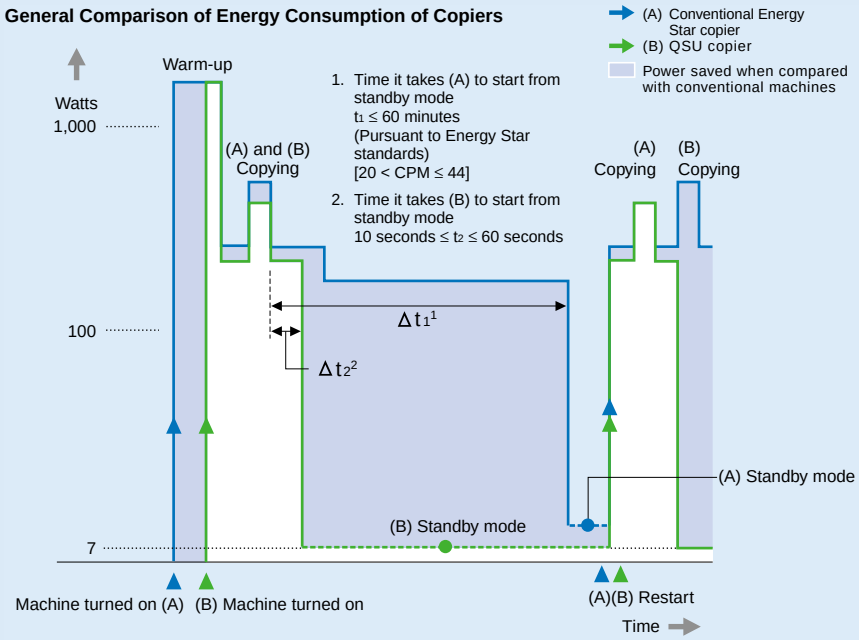
1. Ricoh's unique technology that enables machines to conserve energy and start up quickly when needed
2. A program that promotes the spread of energy conservation products, aiming at global CO_2 reduction
3. In recognition of its superior energy- and resource-saving capabilities, including energy conservation technology, plastic recycling, and parts reuse

Performance Comparison between Aficio 1035 (imagio Neo 350) and the Copier of the Future

	imagio Neo 350	Copier of the Future	Energy Star Program Standards for Copiers
Page/minute	35	30–60	21–44
Watts consumed while in standby mode	7 W	10 W or less	140 W*
Time to recover from standby mode	10 seconds or less	10 seconds or less	30 seconds or less

* This value was calculated using 35 pages per minute. Standard value ≤3.85 × (page/minute) + 5 W.

General Comparison of Energy Consumption of Copiers

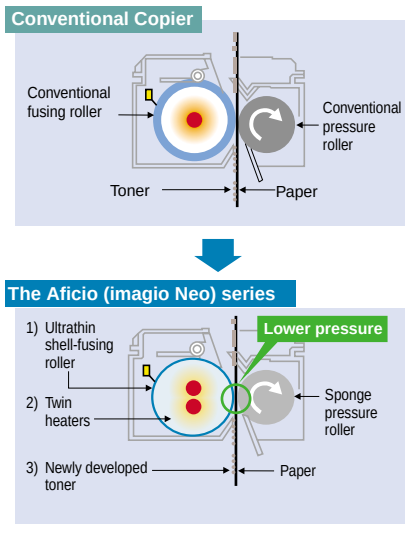


The Aficio 1035 (imagio Neo 350) requires only 7 W while in standby mode and only 10 seconds to begin operating from that mode. This quick-recovery unit realizes low energy consumption while in operation as well.

imagio Neo 350 series

● Ultrathin shell-fusing roller
● Twin heaters

Energy-saving fusing unit for the Aficio 1035 (imagio Neo 350) series



● QSU Technology Incorporated in the Aficio (imagio Neo) series

1) Ultrathin shell-fusing roller
To enable quick recovery from standby, the fusing roller is made as thin as possible to reduce the time needed for the temperature to rise.

2) Twin heaters
The temperature of the roller, which is thinner and easy to cool, carefully regulated by two independently controlled heaters

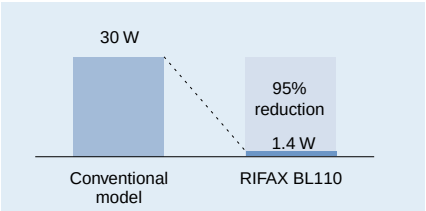
3) Newly developed toner
A new type of toner was developed that can be fixed at a lower temperature and has a fixing capability equal to or greater than that of conventional products. The toner allows the machine to start up faster and it contributes to energy conservation during use.

Standby Mode Energy Conservation Technologies for Facsimiles

In general, all ordinary facsimiles have to be in standby mode to receive transmissions. In 1996, Ricoh developed a CPU dedicated to energy conservation and incorporated it into a hybrid facsimile the Company marketed as the RIFAX BL110. This machine achieved an approximate 1.4 W power consumption, a 95% reduction from the 30 W consumption of Ricoh's conventional machines. Ricoh will be applying this technology to its facsimiles extensively to contribute to global energy conservation efforts.

RIFAX BL110

Comparison of Power Consumption while in Standby Mode



Advanced Technologies for Energy Conservation

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

Ricoh succeeded in making this high-end technology available to more people while decreasing environmental impact.

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

■ Efficient Paper Use

The manufacturing of paper consumes a lot of energy and generates a significant amount of CO_2. To do its part in preventing global warming, Ricoh implemented the more efficient use of paper to its energy conservation goals. The new goal includes improving duplex copying technology, marketing recycled paper, developing technology that can erase photocopied paper, and reducing the Company's paper consumption by computerizing its documentation. Ricoh, as a manufacturer of copiers and printers, is thus taking various approaches toward efficient paper use and doing the best it can to succeed.

Improved Duplex Copying

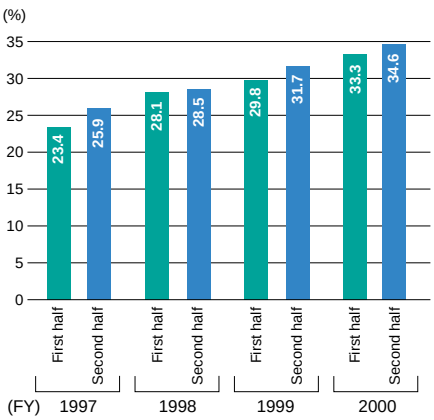
In Japan, approximately 776,000 tons[1] of copier paper are used every year. This is equivalent to roughly 2,328,000 tons[2] of CO_2. These figures cannot be ignored in view of global warming. Therefore, Ricoh is working towards improving the duplex copying performance of its products to help reduce paper consumption. The problems associated with duplex copying include extended operating time and a lack of user-friendliness. To solve these problems, Ricoh has developed a high-speed "switchback" system that speeds up processing by shortening the interval in which paper is fed into the copier. A paper-feeder simulator that eliminates nonfeasible feeding route designs had also been developed. The imagio MF 8570, marketed in 1999, incorporates a "nonstuck interleaf" duplex design to achieve nearly 100% duplex productivity[3] while in continuous operation. Many of our other products have also achieved 100% duplex productivity, and we redesigned the control panel display to improve user-friendliness.

1. Source: *Paper and Pulp Statistical Table,* Ministry of International Trade and Industry, 1997.
2. Source: Ricoh's LCA study in 1997.
3. Duplex copying productivity (%)
   = (Time spent on simplex → duplex copying)/(Time spent for simplex → simplex copying) × 100.
   Time is measured from the moment the desired number of copies is entered and the "Copy" button is pressed to the moment the copier is ready for the next batch of copying.

Marketing Recycled Paper

Ricoh conducts LCA studies on new and recycled paper to identify their environmental impact. Ricoh also markets recycled paper to reduce the amount of energy consumed in manufacturing paper.

Domestic Sales of Recycled Paper

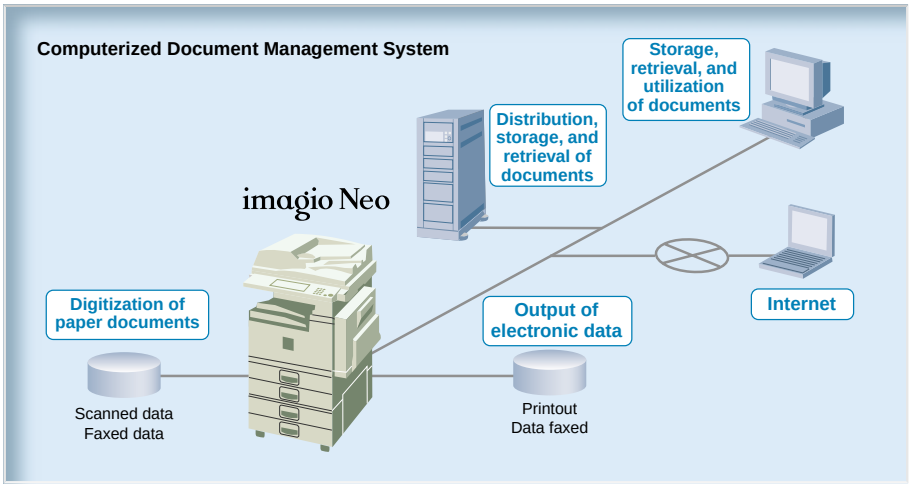


Erasable Photocopies: Technology to Reuse Copier Paper

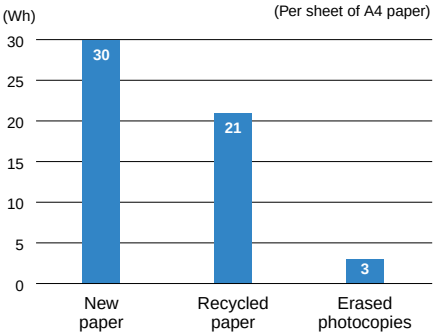
Ricoh Unitechno has developed technology capable of erasing photocopied paper and will market it in 2002. Conventional copiers use heat to fix toner to paper, but Ricoh Unitechno's new machine heats the paper to separate the toner. To get around the problem of toner absorption by the paper, a specially coated paper was developed that can be reused approximately 10 times. This technology makes the in-house reuse of copier paper more efficient and significantly reduces environmental impact because the approximate ¥0.05 cost in

electricity needed to erase photocopies, which is about 14% the energy consumption of recycling paper conventionally, makes reuse a more attractive alternative.

Copier capable of making erasable photocopies



Electric Power Required to Manufacture Paper and Erase Photocopies



Reduction of Paper Consumption by Computer

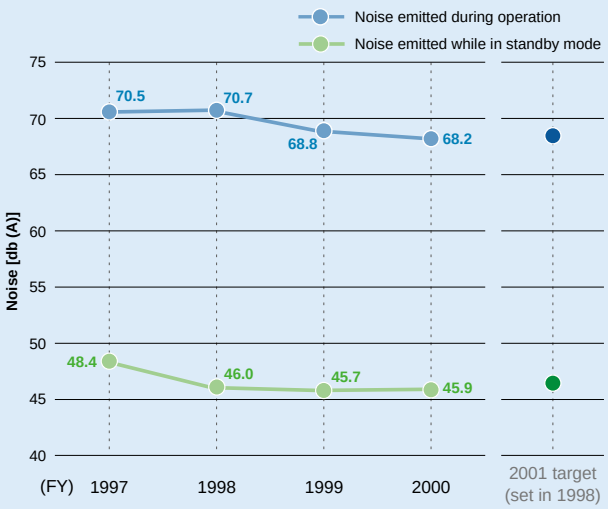
Ricoh provides customers with an ideal printing environment with its high-value-added products, including multifunctional printers, and an efficient computerized document management system. Such a system includes a paperless fax function that displays information on a computer screen, a database function that is incorporated into copiers, and other computer technologies that work with personal computers. Ricoh makes the management of documents more efficient and reduces environmental impact by reducing paper consumption.

■ Reduction of Noise and Chemical Substance Emissions

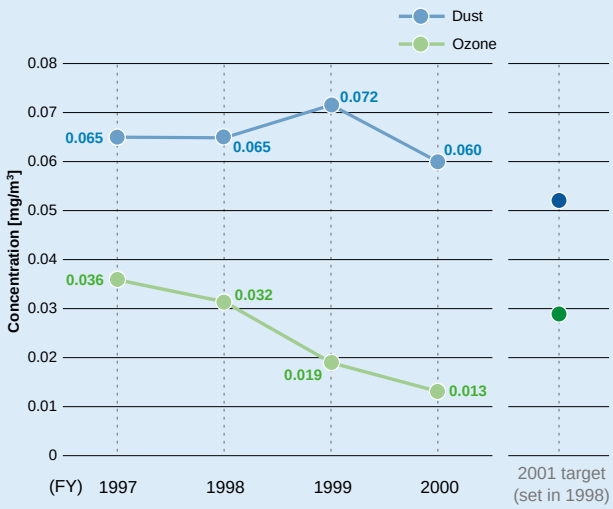
In order to use OA equipment including copiers more comfortably, it is also important to reduce the noise it emits. The emission of ozone and dust, even if very small in amount, are also to be eliminated.

Ricoh is making great efforts to improve its product design so that the noise, ozone, and dust that are emitted are reduced.

Changes in the Level of Noise Emitted by Machines in Operation*



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



* Calculations are based on the weighted number of copiers, facsimiles, and printers sold and use a copying productivity of 50 sheets per minute for all machines. The figures above have been changed pursuant to the calculation method provided by the Japan Business Machine Makers Association (JBMS) in 1999. Therefore, the figures differ slightly from those in the 2000 report.