

Development of User-Friendly and Energy-Saving Technologies

■ Concept

Products that are not easy to use will not be chosen by customers, even if their energy-saving performance is good. Such products can neither contribute to energy conservation nor help prevent global warming. Ricoh is further developing its unique energy-saving QSU (Quick Start-Up) technology*, which enables quick recovery from energy-saving mode, allowing users to make copies whenever they need to. It is also expanding the product line of QSU-equipped machines. Meanwhile, reducing unnecessary paper consumption (indirect energy saving) is important since paper production consumes a lot of energy. Ricoh helps decrease the environmental impact caused by customers' paper consumption by offering user-friendly duplex copying functions, digitization, and promoting sales of recycled paper.

* Ricoh's original energy-saving technology that enables quick recovery from energy-saving standby mode.

■ Targets for Fiscal 2007

◎ Achieve Ricoh's energy-saving goals.

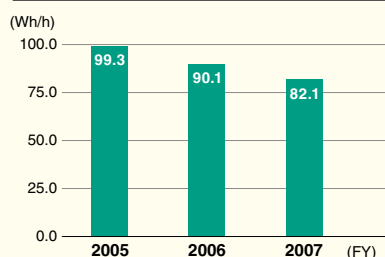
■ Review of Fiscal 2007

In the field of high-speed multifunctional color copiers, we have launched the imagio MP C7500 series,¹ with a warm-up time of less than 90 seconds,² and a recovery time from energy-saving mode of less than 45 seconds, and the Typical Electricity Consumption (TEC)³ of 9.91 kWh⁴ (about 30% less energy consumption than the previous model⁵). These new features were achieved by adopting the low-temperature fixing toner and improving the fusing system. In addition, sales of copiers using QSU technology with a recovery time of less than 10 seconds from energy-saving mode are steadily increasing, thus reducing CO₂ by approximately 50,400 tons a year (see Graph ④).

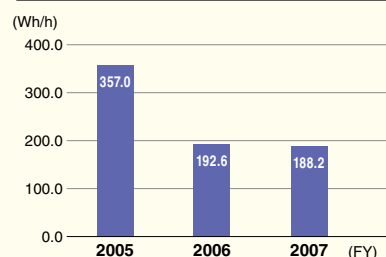
<Japan>

Changes in Energy Consumption

① Black-and-White Copiers and Multifunctional Copiers



② Color Copiers and Multifunctional Copiers



◎ Energy conservation values are calculated as follows:

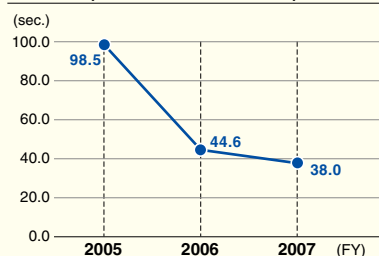
$\sum \{ \text{Effective energy consumption efficiency (Wh/h)}^{-1} \times \text{the number of units marketed} \} / \sum \text{the number of units marketed}$

1. Effective energy consumption efficiency is a figure measured for models with a 10-second recovery time from energy-saving mode in accordance with the Ministry of Economy, Trade and Industry's Law in Japan Concerning the Rational Use of Energy.

(Models with a recovery time of more than ten seconds were measured by electricity consumption in standby mode.)

Changes in Recovery Time from Energy-Saving Mode

③ Color Copiers and Multifunctional Copiers



◎ Recovery time was calculated as follows:

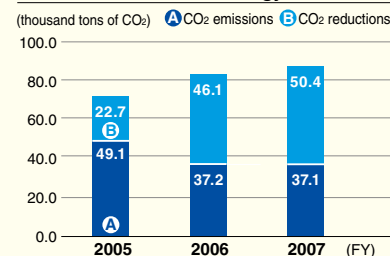
$\sum \{ \text{Recovery time from energy-saving mode (sec.)} > \times \text{the number of units marketed} \} / \sum \text{the number of units marketed}$

* Data for the previous years were corrected as shown in the graph.

* Graphs ① to ③ were compiled based on the number of units marketed in Japan.

<Global>

④ Reduction in CO₂ Emissions through the Use of QSU Technology



* CO₂ reductions (shown as B) represents the difference between the hypothetical emissions if none of our products use the QSU technology and the actual emissions.

■ Future Activities

We will further improve QSU technology, so that more customers will use energy-saving mode, and pursue user-friendliness (shorter recovery time from energy-saving mode) and energy-saving for color copiers.

Segment Environmental Accounting of Product Energy Conservation (Benefit on cost in color QSU product development)

Costs			Effects		
Item	Main costs	Costs	Economic benefits		Effect on environmental conservation
			Internal benefits	Customer benefits	
R&D Cost	Cost of developing energy-saving units, parts, etc.	¥647.7 million	Sales contribution ¥945.3 million	Reduction in payment for consumed power supply ¥238.2 million	Reduction in CO ₂ emissions 3,914.0 tons

* The reduction in payment for consumed power supply and CO₂ emissions is the annual benefit brought from 8 hours of operation per day, 20 days a month. Internal benefits refer to benefits on gross profits in sales results in fiscal 2007.

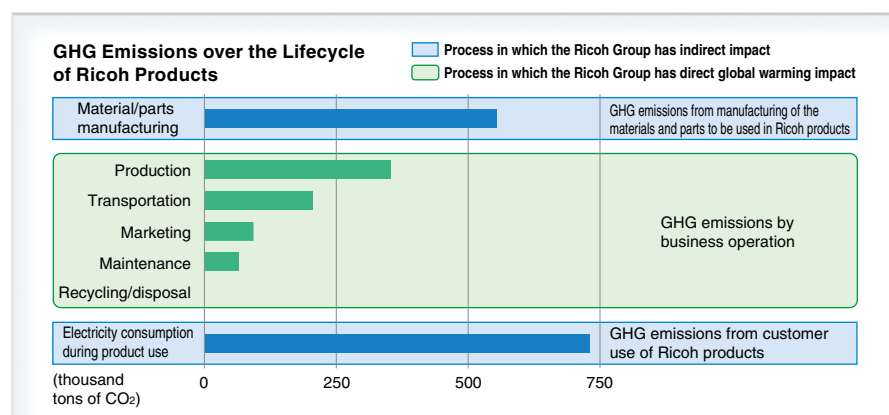
Assessing the Impact on Global Warming by Phase of Product Lifecycle

<Ricoh Group (Japan)>

Our assessment of the impact of our products on global warming shows that substantial levels of greenhouse gases (GHG) are emitted not only from Ricoh Group

operations such as production, transportation, marketing, and maintenance, but also from product use by the customers. We are therefore working to facilitate active

reductions on the customer side as well as on the side of our own operations. Even if customers want to reduce energy consumption to address global warming, they will not be able to do so effectively if the equipment they use in the office has poor environmental performance. Likewise, even if great environmental technology is used in an office-use product, customers do not select the product if it is not user-friendly. With this recognition, the Ricoh Group has continually been working to enhance the energy-saving features of its products and has been taking various steps to encourage more customers to use the energy-saving mode more often.



Environmental Performance of the Energy-Saving Mode

<Ricoh Group (Japan)>

To encourage more customers to use the energy-saving mode more often, it is important to drive the environmental benefits of using the mode home to customers. We are therefore actively communicating a comparison of the electricity consumption level (in terms of TEC¹) with the effective energy-saving mode activated on a Ricoh multifunctional digital full-color copier and with it not activated. The imagio MP C3500 series uses Ricoh's original Color QSU technology. Launched in May 2006, this model exhibits outstanding energy-

saving performance, such as a recovery time of less than 18 seconds from energy-saving mode and about one-fourth the gross energy consumption of the previous model.² Users can substantially reduce their electricity consumption, electricity costs, and CO₂ emissions (see the chart below) by using the energy-saving mode.

1. TEC: Typical Electricity Consumption, presenting the assumed consumption level per week under typical conditions of use.
2. A reference figure to compare the performance of the new imagio MP C3500SP with the previous imagio Neo C355 Model 75 using the revised Energy Star TEC Measuring Procedure, which became effective in April 2007.

Encouraging the Use of Energy-Saving Mode

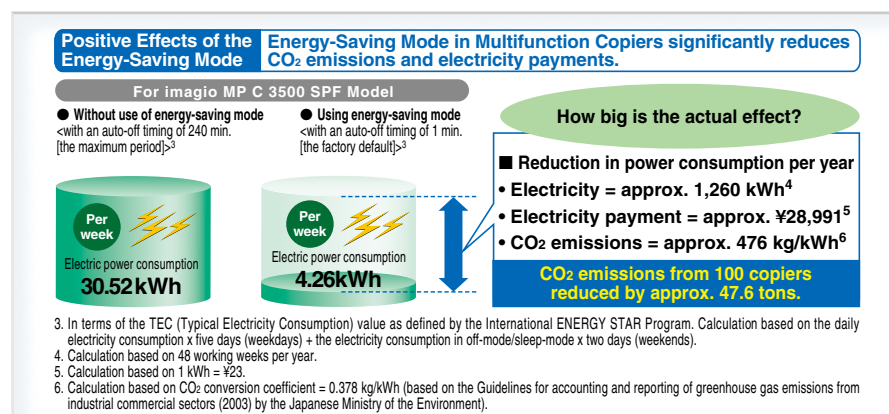
<Ricoh Group (Japan)>

Our customer survey shows that less than 10% of our customers use energy-saving mode regularly. To encourage the use of this helpful function to reduce environmental impact, Ricoh distributed stickers which aim to remind the user of the benefits of the energy-saving mode to customers and requested them to put the stickers on their Ricoh products. We have also prepared awareness-raising posters to encourage energy-saving and paperless operations.



Poster to encourage duplex printing (for Kyushu region)

Poster to encourage energy-saving



Developing Energy-Saving Products

Evolution of Energy-Saving Technology QSU

QSU (Quick Start-Up) is Ricoh's original energy-saving technology developed to achieve effective energy conservation for copiers. It enables quick recovery from energy-saving mode, allowing users to make copies whenever they need to. According to a customer survey, the longer it takes to recover from energy-saving mode, the less energy-saving mode is used. Ricoh has poured its efforts into developing QSU technology in a way that satisfies both user-friendliness and energy conservation so that our customers will use the energy-saving mode more often. In 2001, we launched the imagio Neo 350 series, the first multifunctional monochrome copiers equipped with QSU, and received the Minister of Economy, Trade and Industry Prize, the highest energy-saving award in Japan. Following that, we introduced HYBRID QSU, an integration of traditional QSU technology and capacitors (electric storage devices), in high-speed multifunctional digital copiers and have reinforced the lineup of QSU-equipped products ranging from low-speed monochrome copiers to high-speed copiers.¹ In fiscal 2006, Ricoh developed Color

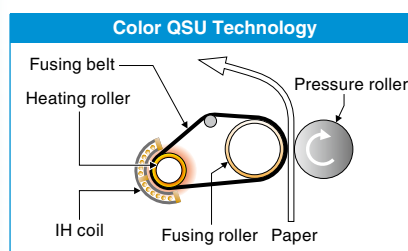
QSU technology, which adopts the IH² fusing system and achieved a reduction in recovery time from energy-saving mode for multifunctional color copiers, which had been a difficult challenge. We also developed energy-saving printers that use our GELJET technology, including the IPSiO GX 2500 launched in September 2007, with maximum energy consumption of

less than 35 watts, which is equivalent to the energy consumption of a fluorescent light.

1. Capacitors are incorporated only in the 100V machines marketed in Japan.
2. IH stands for "Induction Heating," a technology that heats metal instantly with the magnetic force generated by an electric current passing through a coil. This technology is also widely adopted in electric rice-cookers and stoves.

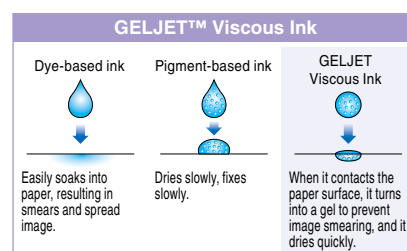
● Color QSU Technology

This technology adopts IH (Induction Heating) using a magnetic field to heat the fusing belt directly and quickly. This enables color copiers to both be user-friendly and highly energy efficient.



● GELJET Technology

GELJET Viscous Ink is a pigment-based ink with high viscosity and high penetration, which enables high-speed duplex printing on plain paper with a picture quality as high as that of laser printers. Its low energy consumption also allows users to save running costs.



Preventing Global Warming through Reduced Paper Consumption

RECO-View RF Tag Sheet—Capable of Displaying Data on Rewritable RF Tags <Ricoh (Japan)>

In fiscal 2003, Ricoh developed the RECO-View RF Tag Sheet by combining RF tags with Ricoh's own rewritable technology, making the RECO-View RF Tag Sheet capable of rewriting and displaying data written on cards or sheets. This sheet displays digital data recorded on a tag, and the display changes as the tag is rewritten. A sheet is capable of being rewritten approximately 1,000 times.^{*} This tool helps prevent human error, as operators are able to visually confirm management information regarding the operation process written on RF tags.

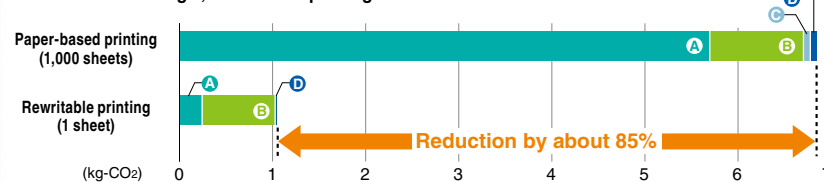
We have received positive feedback from customers, including one from the CO-OP NET Oyama Distribution Center, which uses the tag sheet for the labeling of distribution containers saying, "Your product reduced

the workload and the waste of our labeling process, as we can rewrite data without detaching labels or disrupting the flow of the containers."

^{*} The number may vary, depending on the condition of use.



CO₂ emissions during 1,000 times of printing



[Data coverage] ● Manufacturing: materials and manufacturing processes ● Use: RW printer (calculation based on electricity consumption)/laser printer (calculation based on electricity consumption and toners) ● Collection: 100-km of transport by a 4-ton truck from the usage site ● Disposal: waste disposal (with thermal recovery)/waste disposal (w/o thermal recovery)/landfill/collection of used paper (for paper-based only) [Source] ● Paper: J-LCA database ● Rewritable Sheet: on materials, 4000ss by Independent Administrative Institution National Institute for Materials Science's Ecomaterials Center ● Electricity & gas, data from the Japanese Ministry of the Environment ● Printer, data on IPSiO NX 810 ● Collection and disposal: Japan Tappi Journal 55(6) 838-852 (2001)