

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 solid. 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 allows users to make copies whenever they need to. We are also expanding the product lineup of QSU-equipped machines with a view to reducing recovery time from energy-saving mode to less than 10 seconds for all our models in the future. 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 highly productive duplex copying functions, digitization, and by promoting sales of recycled paper.

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

■ Targets for Fiscal 2010

◎ Achieve Ricoh's energy-saving goals.

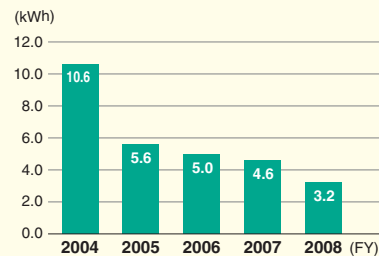
■ Review of Fiscal 2008

In the field of high-speed multifunctional copiers, we launched the imagio MP 7501/6001 series equipped with our original energy-saving technology "HYBRID QSU" to realize a recovery time from energy-saving mode (sleep mode) of 10 seconds¹. These models offer both user-friendliness and energy conservation by enabling warm-up to be completed quickly while users set documents and make copy settings, even when the energy-saving mode is activated. These models also achieve the Typical Electricity Consumption (TEC)² of 7.73 kWh³. 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 emissions by approximately 48,200 tons a year (see graph ④).

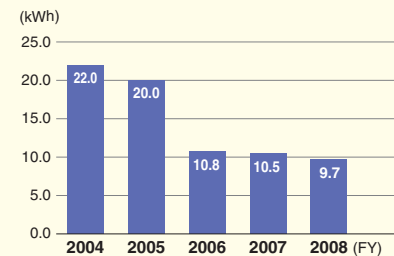
<Japan>

Changes in energy consumption

① Monochrome copiers and multifunctional copiers



② Color copiers and multifunctional copiers



◎ Energy conservation values are calculated as follows:

$\Sigma(<\text{Energy consumption when recovery time is 10 seconds (kWh)}^1 > \times \text{Annual number of units marketed}) / \Sigma \text{Annual number of units marketed}$

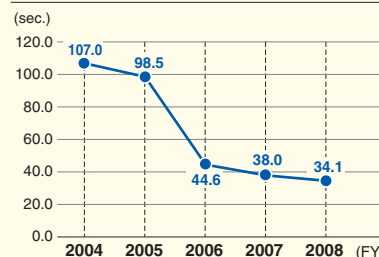
1. Energy consumption when recovery time is 10 seconds: Based on TEC measured for models with a 10-second recovery time from energy-saving mode in accordance with the method defined by the International ENERGY STAR Program. (Electricity consumption in standby mode was measured for models with a recovery time of more than 10 seconds.)

* Graphs ① and ② were compiled based on the number of units marketed in Japan.

<Global>

Changes in recovery time from energy-saving mode

③ Color copiers and multifunctional copiers



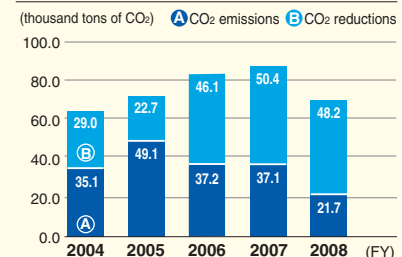
◎ Energy conservation values are calculated as follows:

$\Sigma(<\text{Recovery time from sleep mode (sec.)} > \times \text{Annual number of units marketed}) / \Sigma \text{Annual number of units marketed}$

1. Less than 30 seconds in the case of the existing imagio MP 7500/6000 series.
2. The measuring procedure is defined by the international ENERGY STAR Program.
3. 9.22 kWh for imagio MP 7501 SP and imagio MP 7501; 6.75 kWh for imagio MP 6001 SP; 7.60 kWh for imagio MP 6001.

Effect of QSU technology

④ Reduction in CO₂ emissions through the use of QSU technology



* A + B : CO₂ emissions generated if there had been no QSU-equipped models

A : Actual CO₂ emissions

B : CO₂ emissions reductions realized by the QSU-equipped models

■ 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.	¥583.3 million	Sales contribution ¥1,155.3 million	Reduction in payment for consumed power supply ¥422.5 million	Reduction in CO ₂ emissions 6,943.4 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 2008.

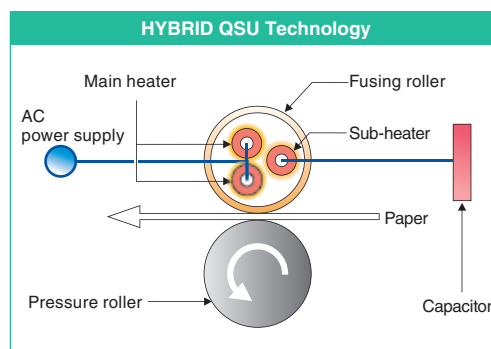
Evolution of energy-saving technology QSU

QSU (Quick Start-up) is Ricoh's original energy-saving technology developed to achieve effective energy conservation for copiers. It enables quick recovery from the 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 the 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 prize of the Energy Conservation Grand Award presented by the Energy Conservation Center, Japan (ECCJ). Following that, we introduced HYBRID QSU, an integration of traditional QSU technology and capacitors (electric storage devices), in high-speed multifunctional monochrome digital copiers, and have since reinforced the lineup of QSU-equipped products ¹. In fiscal 2006, Ricoh developed Color QSU technology, which adopts the IH ² fusing system and successfully achieved a reduction in recovery time from the energy-saving mode for multifunctional color copiers, which had been a difficult challenge. The imagio MP C4000 released in June 2008 features Color QSU technology and new color PxP toner, realizing a recovery time from the sleep mode ³ of less than 15 seconds. We also developed energy-saving printers that use our GELJET technology, including the IPSiO GX 2500 launched in September 2007, which boasts a 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.
3. A type of energy-saving mode [See page 23](#)

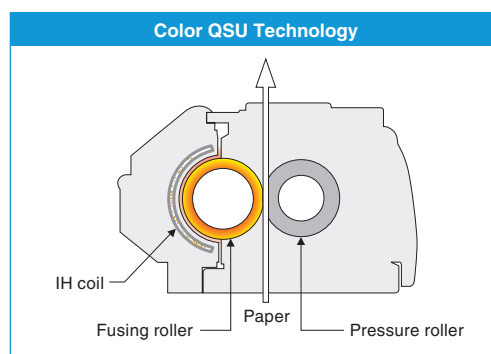
● HYBRID QSU Technology

Traditional QSU technology is combined with a capacitor (electric storage device) to store electricity while in standby mode so that it can be used for start-up and printing operations. This technology is adopted by high-speed type multifunctional copiers.



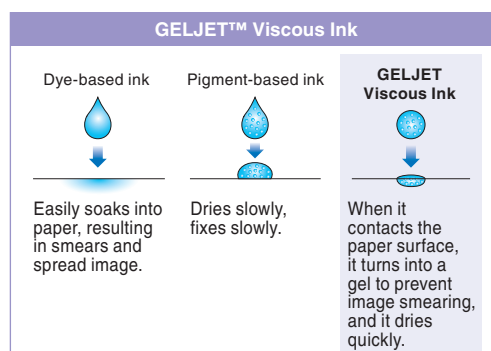
● Color QSU Technology

This technology, based on IH (Induction Heating) that uses magnetic force to produce heat, has been further improved in such a way to cause the fusing roller itself to generate heat. The technology enables color copiers to both be user-friendly and highly energy efficient.



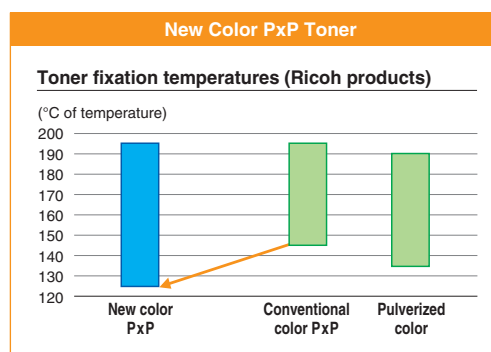
● GELJET Viscous Ink

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.



● New Color PxP Toner

Toner designed to fuse at an even lower temperature than its predecessor, which realizes a shortened warm-up time, faster continuous output, and less energy consumption when in use.



Efforts to realize a more user-friendly energy-saving mode and a recovery time of 10 seconds

Our assessment of the impact of our products on global warming shows that, while there are emissions of greenhouse gases (GHG) from Ricoh Group operations such as production, transportation, marketing, and maintenance, a significant level of CO₂ emissions is also generated while the products are used at customers' sites. The energy-saving mode is automatically activated to minimize power consumption when products are left in standby mode for a certain period of time, and thus it contributes to energy conservation on the part of customers who use Ricoh copiers. To maximize energy-saving effects, it is necessary to set the time of the shift to a higher energy-saving mode to be as short as possible (see the table on the right). According to a customer survey, many customers feel that the waiting time is too long when the recovery time from the energy-saving mode exceeds 10 seconds. Therefore, to encourage customers to use the energy-saving mode without the stress of waiting, Ricoh has been committed to technological development aimed at reducing the recovery time from the energy-

saving mode to less than 10 seconds. For monochrome multifunctional copiers, we achieved a recovery time from the sleep mode ¹ of less than 10 seconds ² when we released the imagio Neo 350 in February 2001, and we have since introduced this feature to many other models. In terms of color multifunctional copiers, we reduced the recovery time from the sleep mode to only less than 15 seconds ² for the imagio MP C4000. For models whose recovery time from the sleep mode still exceeds 10

seconds, the "preheating level 2" button is provided to realize a recovery time of 10 seconds while allowing customers to save energy—although not as much as when in sleep mode—to the maximum extent possible. In this way, Ricoh is offering its customers a way to promote energy conservation without sacrificing user-friendliness.

1. A type of energy-saving mode
2. When used at a room temperature of 20°C. This figure may vary depending on the conditions and history of use.

Energy-saving mode levels and their effects

Setting	Description	Energy-saving effects
Preheating	A standby mode that allows quick recovery. Some models are equipped with a "preheating level 2" button to realize a recovery time of approximately 10 seconds while allowing customers to save energy—although not as much as when in sleep mode—to the maximum extent possible.	Small
Low power consumption	The temperature of the fusing heater is lowered to realize energy conservation while the short-time recovery is maintained.	Middle
Sleep	The power button* on the control panel is automatically turned off to realize the highest level of energy-saving. If the product is cooled to room temperature, the recovery time may be as long as the warm-up time.	Large

* In addition to the power button on the control panel, the products also have the main switch on their body.

* See the manual for each model for specific energy consumption information and other data related to each setting in the energy-saving mode.

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*, making it possible to cut CO₂ emissions by 85% across its lifecycle compared to paper-based printing. This tool also helps prevent human error, as operators are able to visually check information on the management of operation processes written

on RF tags, and it is currently utilized in a wide variety of areas, including logistics, medical care, and office work.

* This number may vary, depending on the condition of use.

* Visit <http://www.reco-view.com> for further details of the RECO-View RF Tag Sheet.

