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 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 is important since paper production consumes a lot of energy (indirect energy saving). 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 2006

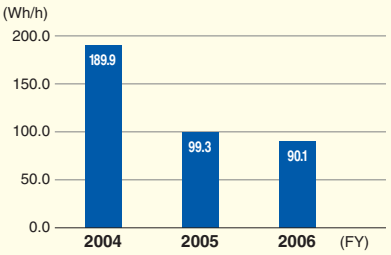
In the field of color multifunctional copiers, we have developed Color QSU technology using the induction heating (IH) fusing system and launched a new model, the imagio MP C3500 series[2], with a recovery time from energy-saving mode of less than 18 seconds[1], less than one-fourth of the previous model. In the field of multifunctional monochrome copiers, sales of copiers using QSU technology with a recovery time from energy-saving mode of less than 10 seconds are steadily increasing, thus reducing CO_2 by approximately 46,100 tons a year (see Graph ❹).

1. This applies only to models for Japan.
2. Printing speed of imagio MP C3500: color copies 35 pages/min. and monochrome copies 35 pages/min.

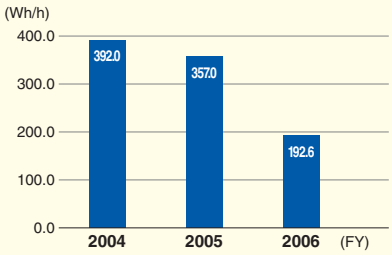
<Japan>

Changes in Energy Consumption

❶ Black-and-White Copiers and Multifunctional Copiers



❷ Color Copiers and Multifunctional Copiers

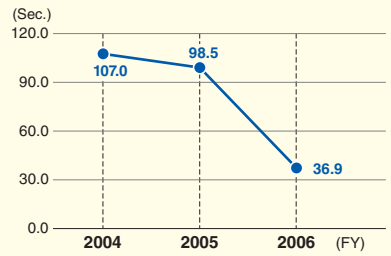


◎ Energy conservation values are calculated as follows:
∑(<Effective energy consumption efficiency (Wh/h)>[1] × the number of units marketed)/∑ the number of units marketed

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

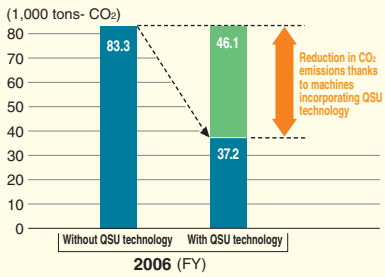
❸ Color Copiers and Multifunctional Copiers



◎ Recovery time was calculated as follows:
∑(<Recovery time from energy-saving mode (sec.)> × the number of units marketed)/∑ the number of units marketed

<Global>

❹ Reduction in CO_2 Emissions through the Use of QSU Technology



* Only the effects of QSU technology used in multifunctional black-and-white copiers were calculated.

* Graphs ❶ to ❸ were compiled based on the number of units marketed in Japan.

● Future Activities

We will further improve QSU technology, so that more customers will use energy-saving mode, and pursue userfriendliness (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		
			Economic benefits		Effect on environmental conservation
Item	Main costs	Costs	Internal benefits	Customer benefits	
R&D cost	Cost of developing energy-saving units, parts, etc.	¥456.0 million	Sales contribution ¥496.9 million	Reduction in payment for consumed power supply ¥192.2 million	Reduction in CO_2 emissions 3,158.6 (t)

* The reduction in payment for consumed power supply and CO_2 emissions is the annual benefit brought from 8 hours of operation per day, 20 days of operation a month. Internal benefits refer to benefits on gross profits in sales results in fiscal 2006.

Developing Energy-Saving Products

Evolution of Energy-Saving Technology QSU

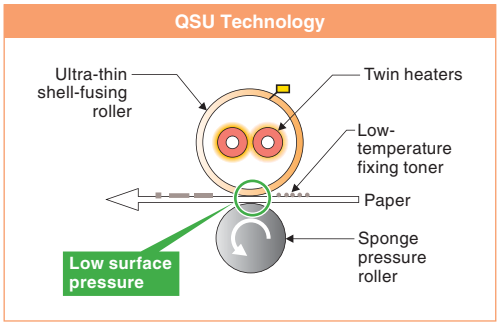
QSU (Quick Start-Up) is Ricoh's original energy-saving technology developed to achieve effective energy conservation for copiers. It enables quick recovery from energy-saving mode, allowing users to make copies whenever they need to. According to a customer survey, the longer it takes to recover from 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 of the Energy-Saving Awards. Following that, we introduced HYBRID QSU, an integration of traditional QSU technology and capacitors (electric storage devices), to high-speed digital multifunctional 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 IH[2] fusing system and achieved a reduction in recovery time from energy-saving mode for color copiers, which had been a difficult challenge.

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.

QSU Technology, HYBRID QSU Technology, and Color QSU Technology

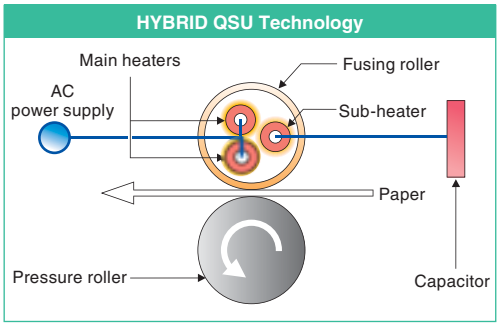
● QSU Technology

The fusing roller that fixes the toner on the paper was thinned as much as possible to shorten the temperature rise time. The temperature of the roller is effectively controlled by using twin heaters. Low-temperature fixing toner is also adopted.



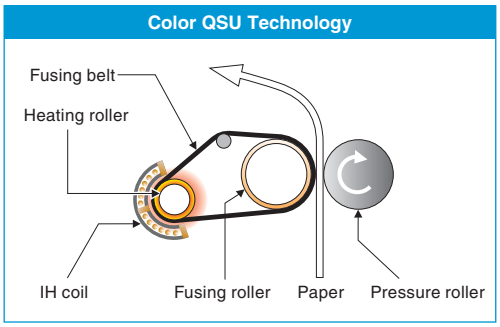
● HYBRID QSU Technology

This technology incorporates capacitors (electric storage devices) into QSU technology to store electricity during standby so that it can be used for restarting and printing. This technology is incorporated into high-speed copiers.



● 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.



The imagio MP C1500 Receives an Energy-Saving Award

<Ricoh (Japan)>

On January 31, 2007, the imagio MP C1500 series received the Energy Conservation Center Chairman's Prize in the 17th Energy-Saving Awards that were held by the Energy Conservation Center, Japan. We were awarded the prize for developing low-cost business-oriented color copiers, for reducing the maximum electrical power consumption with our Gel Jet technology, and for achieving a fast 5-second recovery time from sleep mode. Previous to this, the imagio MP C1500 (model name outside Japan: Aficio MP C1500) also won the Silver Award in the EPIF 2006 Eco-Awards at the ECO Products International Fair 2006 held in Singapore in October 2006, which shows that this model was highly evaluated as an energy-saving machine both in Japan and abroad.

imagio MP C1500

Launch of Products with Color QSU Technology

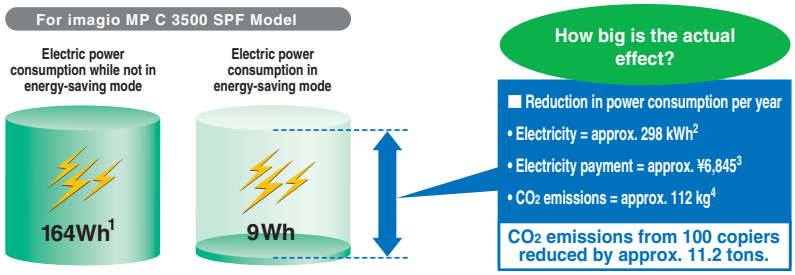
<Ricoh (Japan)>

The digital multifunctional color copier, imagio MP C3500 series, launched in May 2006 uses the new Color QSU technology. This new technology adopts the IH fusing system to warm up the fixation belt, shortening significantly the recovery time from energy-saving mode. Recovery time for imagio MP C3500 series was cut by 75% over the previous series to less than 18 seconds. Gross energy consumption was also cut back by approximately 50%* —a superb energy-saving performance.

* 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.

Positive Effects of the Energy-Saving Mode

Energy-Saving Mode in Multifunction Copiers significantly reduces CO_2 emissions and electricity payment.



1. Average electric power consumed by repeatedly making 30 consecutive copies once every hour before shifting to energy-saving mode eight times a day.
2. Calculation based on the assumption of eight working hours per day for 240 days per year.
3. Calculation based on 1kWh = ¥23.
4. Calculation based on CO_2 conversion coefficient = 0.378 kg/kWh (based on the Guidelines for accounting and reporting of greenhouse gas emissions from industrial commercial sectors (2003) by the Japanese Ministry of the Environment).

Indirect Energy-Saving 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. Operators are thus able to visually confirm management information regarding the operation process written on RF tags. Because this helps prevent human error, RECO-View RF Tag Sheets are now being used by customers in various industries, including distribution and healthcare.

Printer for RF tag sheet

RECO-View RF tag sheet

INTERVIEW

Customer Interview | **Sagawa Express Co., Ltd.**

Mr. Yasuyuki Kurokawa
Assistant Manager, Sales Section,
Sales Division (in charge of sales planning),
Sagawa Express Co., Ltd.

With the RECO-View Sheet, we were able to reduce paper consumption by 500,000 sheets per year.

Significant cutbacks in paper and cost were the motivation for introducing the RECO-View Sheet.

We provide a service called "Sagawa-Yu-Mail" for our customers, in which we undertake to distribute booklets and brochures for our corporate clients. In the Tokyo Big Bay Distribution Center, we sort and distribute 200,000 to 300,000 Sagawa-Yu-Mail parcels every day. Parcels are sorted into approximately 5,000 boxes according to destination and a paper list of instructions is attached to each of these boxes. These paper lists used to be discarded when all the parcels had been sorted. By switching from paper to RECO-View sheets for the instructions, we were able to reduce paper consumption by about 500,000 sheets per year. At first, we were worried whether the instructions would still be clearly visible after repeated rewriting. However, the previous instructions are erased without a trace and we are having no trouble using the tag sheets. The characters are also printed very clearly and are easy to read, which enables faster and more accurate work. Sagawa Express is actively involved in environmental conservation activities including modal shift and reducing waste and CO_2 emissions. Converting a reduction in consumption of 500,000 sheets per year to CO_2 emissions gives a reduction in emissions of approximately 3 tons of CO_2. Moreover, we were able to cut back on the cost of purchasing, printing, and disposing of 500,000 sheets of paper. Significant cost benefits were the motivation behind introducing the RECO-View sheet.