

## We will reduce total CO<sub>2</sub> emissions by 12% by the end of fiscal 2010 to help prevent global warming.

### ■ Concept

The Ricoh Group has set goals that it wants to achieve by the end of fiscal 2010, aiming to lead effective efforts to prevent global warming. Since a reduction in total CO<sub>2</sub> emissions is important in preventing global warming, the Ricoh Group companies in Japan have set a higher goal of reducing total emissions by 12% over the fiscal 1990 figure by the end of fiscal 2010, compared with the goal for Japan of a 6% reduction as set out in the Kyoto Protocol. Our Group companies are striving to reduce global warming under this goal, which has been set in anticipation of an expansion in the scale of business. In addition, the Group is making preparations for the Clean Development Mechanism (CDM)<sup>1</sup> as a scheme to prepare as far as possible for a rapid expansion of business through M & As and, although unlikely, increased CO<sub>2</sub> emissions due to worsening of CO<sub>2</sub> emissions conversion coefficients. Efforts will also be made to reduce greenhouse effect gases other than CO<sub>2</sub> by 10% over the fiscal 1995 level by the end of fiscal 2010. In March 2009, the Group also set mid- to long-term goals of reducing total lifecycle CO<sub>2</sub> emissions by 87.5% by 2050 and 30% by 2020 from the fiscal 2000 level<sup>2</sup>.

1. See page 37.

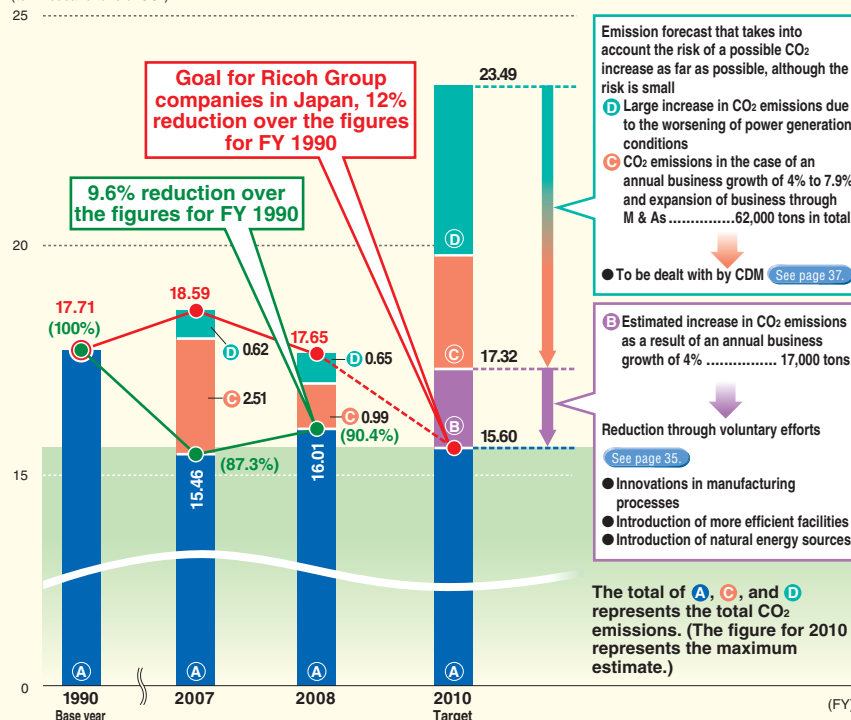
2. See pages 15 and 16.

### ■ Targets for Fiscal 2010

- ◎ Reduce CO<sub>2</sub> emissions by 12% (Ricoch and manufacturing subsidiaries in Japan, compared to fiscal 1990 figures) by fiscal 2010.
- ◎ Reduce CO<sub>2</sub> emissions by 10% (manufacturing subsidiaries outside of Japan, compared to fiscal 1998 figures) by fiscal 2010.
- ◎ Reduce greenhouse gas emissions (except CO<sub>2</sub>) in the semiconductor business division by 10% (compared to fiscal 1995 figures) by fiscal 2010.

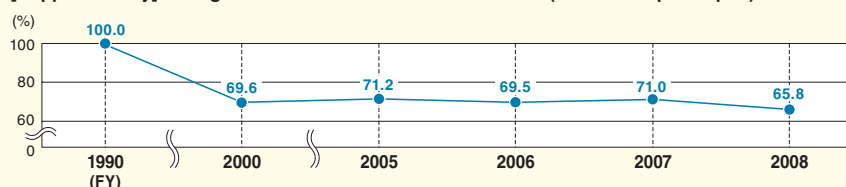
Scenario for reductions in total CO<sub>2</sub> emissions for Ricoh Group (Production) in Japan up to fiscal 2010

(ten thousand tons of CO<sub>2</sub>)



\* The figures for fiscal 2008 and the following years include the results for Ricoh Printing Systems, Ltd. and Yamanashi Electronics Co., Ltd., while those for the preceding years have been adjusted accordingly (included in C).

[Supplementary] Changes in CO<sub>2</sub> emissions/sales basic unit (Ricoch Group in Japan)



Segment environmental accounting of energy conservation activities at business sites (Japan)

Costs			Effects		
Item	Main cost	Costs	Economic benefits		Effect on environmental conservation
			Item	Benefits	
Business area cost	Cost of global warming prevention	¥273.7 million	Reduction in lighting and heating expenses	¥1,424.6 million	CO <sub>2</sub> emissions (Reduction amount)
					48,956.0 tons

\* The amount of reduction in CO<sub>2</sub> emissions is the total of reductions realized through measures taken by respective sites to prevent global warming (including the effects of reduction measures taken in the past).

### ■ Targets for Fiscal 2020 and 2050

	Target for fiscal 2020	Target for fiscal 2050
Ricoh Group Total lifecycle CO <sub>2</sub> emissions (including emissions of the five gasses converted into CO <sub>2</sub> )	30% reduction* (compared to fiscal 2000 figures) *Equivalent to a 34% reduction compared to the fiscal 1990 level (CO <sub>2</sub> emissions in Japan)	87.5% reduction (compared to fiscal 2000 figures)

## ■ Review of Fiscal 2008

CO<sub>2</sub> emissions at production sites decreased 0.3% in Japan from the fiscal 1990 level and increased 2.8% outside Japan over the fiscal 1998 level (see graphs ① and ③). This suggests that efforts to reduce CO<sub>2</sub> emissions, particularly those to innovate manufacturing processes, have brought steady results, in consideration of business growth since fiscal 1990. In real terms, this represents a 9.6% reduction over fiscal 1990 levels, because Ricoh will introduce CDM to cope with any increase in CO<sub>2</sub> emissions caused by business growth of over 4% per year and changes in CO<sub>2</sub> emissions conversion coefficients (See ④, Scenario for reductions in total CO<sub>2</sub> emissions for Ricoh Group (Production) in Japan up to fiscal 2010 on [Page 33](#)). As for greenhouse gases other than CO<sub>2</sub>, the semiconductor business division achieved a 34% reduction, and the entire Ricoh Group, a 26% reduction, over fiscal 1995 levels (see graph ④).

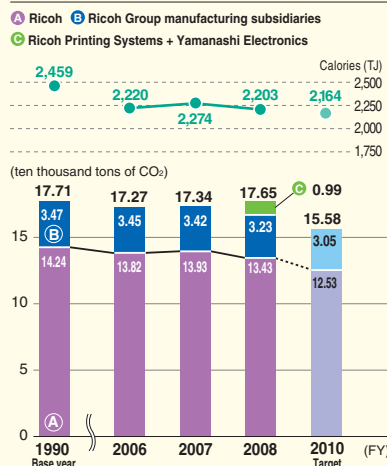
## ■ Future Activities

In order to offset an increase in CO<sub>2</sub> emissions caused by annual growth of up to 4% through voluntary efforts, Ricoh will promote efforts to reduce CO<sub>2</sub> emissions particularly by innovating production processes to reduce energy consumption in manufacturing as part of its efforts to continue reducing CO<sub>2</sub> emissions at production sites in fiscal 2009 and thereafter. In particular, efforts will be made to reduce the increase in CO<sub>2</sub> caused by growth of over 4%, especially aiming to reform processes in the supply sector and the parts business in China, which have shown marked growth. Positive efforts will also be made to introduce high-efficiency facilities and new energy sources to make investment more effective and operations more efficient. Also, we are preparing for the introduction of CDM in order to realize a 12% reduction over the fiscal 1990 levels in total CO<sub>2</sub> emissions in Japan, even taking into consideration a maximum possible increase in CO<sub>2</sub> emissions.

## <Japan>

### Energy consumption (CO<sub>2</sub> conversion and calories)

#### ① The Ricoh Group (Production)



### Breakdown of major energy consumption

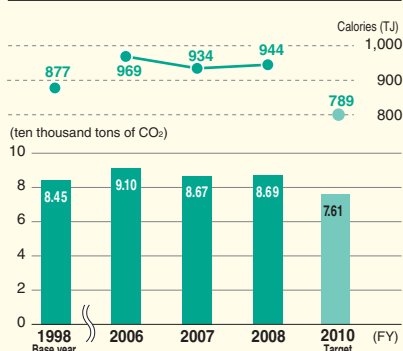
#### ② The Ricoh Group (Production)

	FY 2005	FY 2006	FY 2007	FY 2008
Kerosene (kℓ)	2,205	1,525	1,389	1,404
Heavy oil A (kℓ)	2,706	2,730	2,706	2,945
Town gas (1,000 m <sup>3</sup> )	15,400	15,899	15,789	14,059
Natural gas (1,000 m <sup>3</sup> )	6,079	7,219	7,257	6,450
Electric power purchased (1,000 kWh)	274,273	291,276	296,150	313,902

## <Outside Japan>

### Energy consumption (CO<sub>2</sub> conversion and calories)

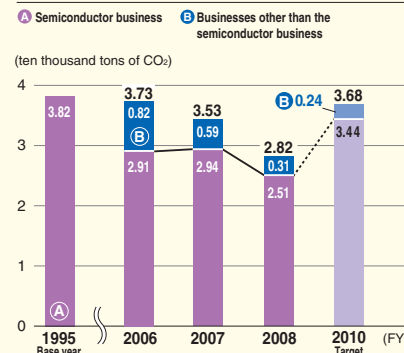
#### ③ The Ricoh Group (Production)



## <The Entire Ricoh Group>

### Greenhouse gas emissions other than CO<sub>2</sub>\* (CO<sub>2</sub> conversion)

#### ④ The Ricoh Group (Production)



\* NF<sub>3</sub> and substances that have a global warming effect and designated in the Kyoto Protocol

\* The following CO<sub>2</sub> emissions coefficients are used in the graphs above.

① and ②: Guidelines for accounting and reporting of greenhouse gas emissions from industrial commercial sectors (2003) by the Japanese Ministry of the Environment

③: GHG Protocol

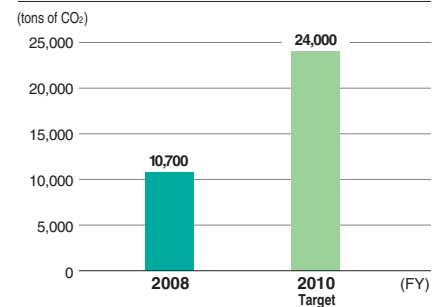
## Setting a target for CO<sub>2</sub> reduction through improvements in business activities

### <Ricoh Group (Japan)>

In its activities, the Ricoh Group gives priority to innovations in production processes and the introduction of high-efficiency equipment and natural energy, so that it can achieve the goal of reducing total CO<sub>2</sub> emissions in Japan by 12% by fiscal 2010 from the fiscal 1990 level. To ensure that we achieve this goal, it is necessary to make systematic reduction efforts. In 2003, Ricoh estimated growths in business

up to 2010 (4% annually), and set a target for CO<sub>2</sub> reduction through voluntary efforts such as improvements in business activities without relying upon CDM of 61,000 tons. Of that amount, the Group aims to reduce 24,000 tons in the period between fiscal 2008 and 2010. By clarifying a mid-term reduction target, activities can be implemented systematically, although it may be a long time before the effects start to appear. In fiscal 2008, CO<sub>2</sub> emissions were reduced by about 10,700 tons through sustained efforts, including innovations in production processes.

### Total reduction in CO<sub>2</sub> through improvements in business activities

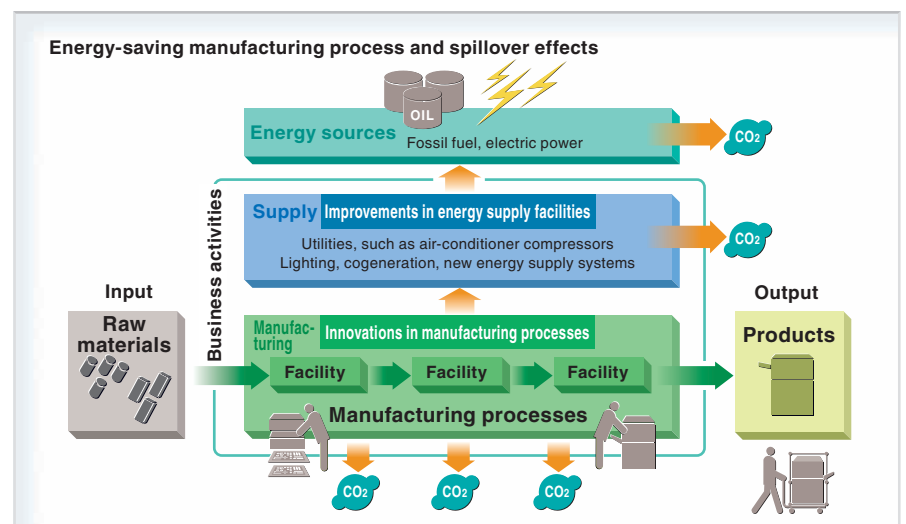


## Innovations in Manufacturing Processes/Introduction of High-Efficiency Equipment/Introduction of Natural Energy

## Innovations in manufacturing processes to achieve the goal of CO<sub>2</sub> reduction

### <Ricoh Group (Global)>

To achieve the goal of reducing CO<sub>2</sub> emissions in Japan by 12% of the fiscal 1990 level by fiscal 2010, the Ricoh Group's energy-saving production process committee, which is made up of people in charge of the Group's major production sites in Japan, checks the manufacturing processes of those production sites, identifies energy losses, and assigns a quota to each on reducing CO<sub>2</sub> emissions. Focusing on innovations in manufacturing processes may save energy at downsized production lines and also have a spillover effect on associated equipment, such as air conditioners and air compressors, at production lines. To date, downsized production lines for organic photoconductors have been put in operation, while the size of toner filling devices has been dramatically reduced. In addition, innovative processes have been realized, including changes in the toner crush lines and thermal sheet painting methods. These technologies are being successively introduced into production lines outside Japan, aiming to achieve the ambitious goal of reducing total CO<sub>2</sub> emissions by 10% (compared to the fiscal 1998 level) at manufacturing subsidiaries outside of Japan.



### Shift to natural gas boilers

#### <Yamanashi Electronics Co., Ltd. (Japan)>

Yamanashi Electronics Co., Ltd., which joined the Ricoh Group in November 2006, produces selenium/organic photoconductor drums, among others. Over the period from April 2007 to August 2008 boilers at its main plants, the Miyahara and Osato plants, which were fueled by heavy oil and used for the production of organic photoconductors, were replaced with high-efficiency boilers using natural gas. As a result, not only was fuel consumption reduced but also the area needed to house the boilers shrunk by about 60%. In addition, the tanks for the storage

of heavy oil became no longer necessary, and related and troublesome management work has been reduced. These efforts realize a reduction equivalent to about 531 tons of annual CO<sub>2</sub> emissions, or cost reduction of about ¥9.8 million (on a full capacity basis).



Natural gas boiler that takes up 60% less space than the previous boiler

### Horizontal expansion of organic photoconductor compact lines <Ricoh RS (Reprographic Supply) Products Division (Global)>

When organic photoconductors used for copiers and printers are manufactured, they have to be handled in clean circumstances with little dust. Traditional large lines required large energy for clean air conditioning, which required significant investment and caused much environmental impact. So the idea of a traditional production line where several organic photoconductors were put on a pallet was thoroughly reviewed, and a new production line was developed. This line adopts a method that sees the flow of one to two organic photoconductors at a time so that only part of the line requires clean air conditioning. In addition, the hot blast drying process, which required vast amounts of energy, was abandoned and new drying technology adopting an IH heating method was developed. This has led to far shorter start-up times and has significantly reduced energy consumption in the drying process.

As a result of these efforts, a microminiature organic photoconductor production line was developed: the line length was shortened to one sixth of the previous model, while the installation space was reduced to one sixteenth and the area needing clean air conditioning to only one ninety-second. Not only were the space and energy required reduced but facility costs and line start-up times have dropped significantly, while production efficiency improved by about 100%. By the end of March 2009, organic photoconductor compact lines had been installed at two bases in Japan and China. This has led to annual reductions in CO<sub>2</sub> emissions of about 2,300 tons, electricity consumption of about 6,300 MWh, and costs of about ¥650 million. As this is a successful example of innovative manufacturing process improvement which led to significant reductions in environmental and cost burdens, it was awarded the grand prize in the 2008 Ricoh Group Sustainable Development Award (Process Technology Innovation Segment).

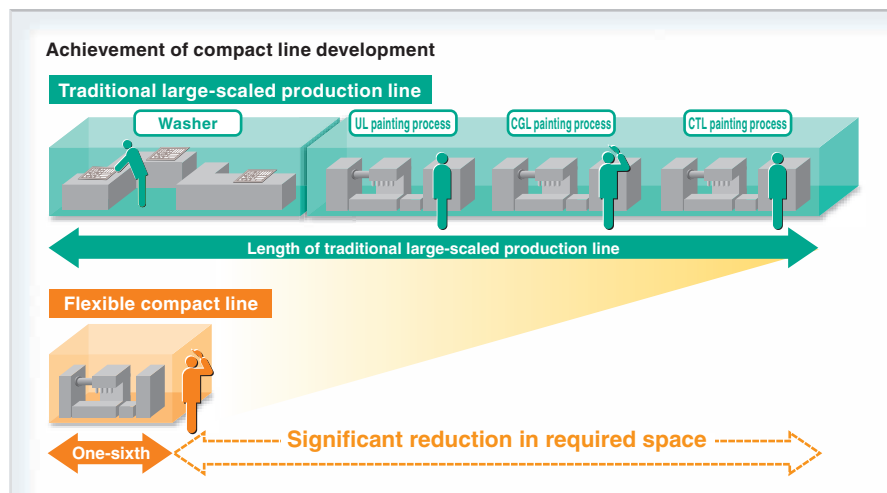
### Change in heating methods for parts molding process <Ricoh Asia Industry (Shenzhen) Ltd. (China)>

In the parts production department of Ricoh Asia Industry (Shenzhen) Ltd. (RAI), heat energy used in the molding process, which requires heat for the dissolution of materials, had a significant environmental impact. In January 2009, the heating method for this process was replaced with an IH heating method. As a result, electricity consumption fell by about 28%, while energy needed for air conditioning also dropped as no extra heat is emitted from the device. In addition, the life of screws became six times longer than before, which resulted in a significant reduction in facility costs. This improvement produced a CO<sub>2</sub> reduction effect of 12.4 tons, and we plan to apply the new method to other facilities to achieve even greater effects.

### Introduction of solar power boilers

#### <Shanghai Ricoh Digital Equipment Co., Ltd. (China)>

Use of natural energy is one effective way to continue energy conservation at business sites. Shanghai Ricoh Digital Equipment Co., Ltd. (SRD) introduced a boiler using solar power into its hot water supply system for the shower room in August 2008. This system applies a new method using not only electricity but also heat produced by solar power. Compared with traditional systems, electricity consumption can be reduced by 80%. The introduction of the system is expected to produce cost reduction effects of about 25,000 yuan (¥350,000), which is the equivalent of 22.7 tons of CO<sub>2</sub> emission per year.



### Improvement of clean air conditioning of semiconductor production line

#### <Ricoh Yashiro Plant, Ricoh Electronic Devices Company (Japan)>

Clean circumstances strictly controlled by air conditioning are necessary for the production of semiconductors. With clean air conditioning, fresh air from outside is let into the air-conditioning system, which is mixed with air inside the system, so that air of a certain temperature, humidity, and purity

can be introduced into the clean room. The energy necessary for this clean air conditioning accounts for half of the energy required for semiconductor production. At Ricoh Yashiro Plant, improvement efforts have been promoted, including the introduction of local clean air conditioning. Moreover in fiscal 2008, the air-conditioning system was optimized after being fully reviewed and checked. As a result of careful use in consideration of seasonal changes in temperature and reuse of heat from the production site, CO<sub>2</sub> emissions were reduced by about 410 tons a year.



## Approach for CDM project

The CDM\* allows advanced nations to conduct projects to combat global warming in developing countries, thereby helping those countries comply with their commitment to reduce greenhouse gas emissions as specified under the Kyoto Protocol. If businesses in advanced nations reduce greenhouse gases through projects in developing countries, they may have that reduction reflected in their own CO<sub>2</sub> reduction goals under certain rules, and ultimately such reduction is used by the governments of their countries to meet national targets. Developing countries benefit from this mechanism as well since they are given opportunities to receive investments

and technology transfers. Ricoh estimates the maximum increase in CO<sub>2</sub> emissions caused by rapid business expansion associated with M & A and external factors such as changes in CO<sub>2</sub> emissions conversion coefficients at 138,000 tons, and is preparing for CDM to mitigate the increase. When selecting CDM projects, Ricoh takes cost performance into account. In addition, by using networks with environmental NPOs, Ricoh strives to choose projects that contribute to the conservation of ecosystems and improvement of living standards of the local people. In terms of the organizations that execute projects, Ricoh assesses their commitment to corporate

social responsibility. In June 2008, a 30,632-ton credit for emissions regarding wind power generation projects in India was transferred to Ricoh's account, Ricoh's first acquisition of such a credit. Ricoh is steadily promoting efforts for acquiring further credits.

\* CDM: Clean Development Mechanism

The Ricoh Group established the following criteria for the selection of CDM projects

- (1) Projects should be valuable from the perspective of biodiversity and ecosystem conservation. As for afforestation projects, they should be recognized by environmental NGOs.
- (2) Projects should be socially recognized by every stakeholder.

CDM projects promoted by Ricoh

Project name	Progress of projects		
	Approval of methodology	Registration with the UN	Credit transfer/acquired credit volume (tons) (CO <sub>2</sub> )
Wind power generation <India>	—	December 15, 2006	30,632 tons in June 2008, 59,000 tons currently in the transfer process
Bagasse electricity generation <El Salvador>	—	November 30, 2007	Monitoring and review under way for certification (190,792 tons)
Environmental afforestation <Ecuador>	February 15, 2007	Preparation of project design under way	

### Wind power generation <India>

The rapid economic growth in India has caused concern about the increased number of low cost, coal-fired power stations that satisfy the growing need for power. Responding to this concern, Ricoh is taking part in a number of wind power projects carried out in various parts of India in order to switch from fossil fuel to wind energy to generate electricity.



### Bagasse electricity generation project <El Salvador>

El Salvador is giving priority to electricity generation from bagasse as a CDM project of the UN, aiming to reduce its dependence on fossil fuel. CO<sub>2</sub> emissions from sugar refining, which is one of the major industries of El Salvador, can be reduced by switching from fossil fuel-fired power generation to bagasse (pulp left after the juice has been extracted from sugar cane) power generation to supply energy to refining factories. Under this project, in which Ricoh is taking part, generators capable of producing a total of 45 MW were introduced in 2002 through 2005. In addition, Ricoh helped improve energy utilization efficiency by introducing a cogeneration system and has created a system of selling surplus electricity through electric power companies.

### Environmental afforestation <Ecuador>

Although the Choco Manabi region in Ecuador is famous worldwide for its biodiversity, forests were cut down by stockbreeders, but afterwards the deforested areas were abandoned as the livestock business in Ecuador went into a recession. Under the project, seeds to grow seedlings for reforestation purposes are collected, local people are employed to conduct afforestation, and virgin forests are maintained and managed. It is difficult to measure the CO<sub>2</sub> absorption levels in afforestation projects, which makes it difficult to obtain the approval of the UN CDM Executive Board. This project was the first afforestation project that was invested in solely by an individual Japanese corporation, where the CDM Executive Board approved the methodology. It is also the world's first case approved among the projects for which the main purpose is biodiversity conservation.