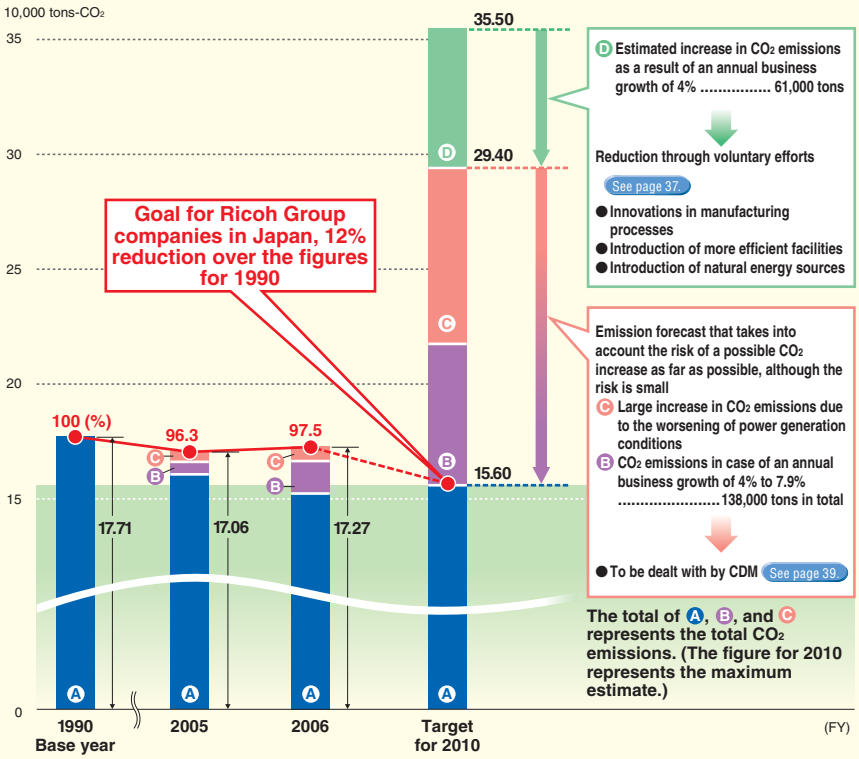
We have set higher goals than those set out in the Kyoto Protocol to help prevent global warming. We will reduce total CO_2 emissions by 12% by the end of fiscal 2010.

● Concept

The Ricoh Group has set goals that it wants to achieve by the end of fiscal 2010, aiming not only to attain the goals set out in the Kyoto Protocol, but also to lead the efforts to prevent global warming. Since a reduction in total CO_2 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 figures in fiscal 1990 by the end of fiscal 2010, compared with the goal for Japan of a 6% reduction 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. To attain this goal, the Ricoh Group is working to innovate its production processes[1], introduce more efficient facilities, and utilize natural energy sources. In addition, the Group is making preparations for the Clean Development Mechanism (CDM)[2] as a scheme to prepare as far as possible for a rapid expansion of business through M&As and, although unlikely, increased CO_2 emissions due to the worsening of CO_2 emissions conversion coefficients. Efforts will also be made to reduce greenhouse effect gases other than CO_2 by 10% over the level in fiscal 1995 by the end of fiscal 2010.

1. See page 37. 2. See page 39.

Scenario for Reductions in Total CO_2 Emissions for Ricoh Group (production) in Japan up to Fiscal 2010



Segment Environmental Accounting of Energy Conservation Activities at Business Sites (The Entire Ricoh Group)

Costs			Effects			
			Economic benefits		Effect on environmental conservation	
Item	Main cost	Costs	Item	Benefits	Reduction item	Amount
Business area cost	Cost of global warming prevention	¥520.8 million	Reduction in lighting and heating expenses	¥337.0 million	CO_2 emissions	11,581.5 (t)

● Targets for Fiscal 2007

◎ Reduce CO_2 emissions by 4% (Ricoh and manufacturing subsidiaries in and outside of Japan, compared to fiscal 2000 figures).

◎ Reduce CO_2 emissions by 4% (non-manufacturing subsidiaries in Japan, compared to figures in the base fiscal year set at each company).

◎ Reduce greenhouse gas emissions (except CO_2) in the semiconductor business division by 15% (compared to fiscal 2000 figures).

● Targets for Fiscal 2007 and Fiscal 2010

The Ricoh Group's Targets for Reducing CO_2 Emissions (Total Amount Emitted)

		Target for fiscal 2007	Target for fiscal 2010
Japan	Ricoh and Ricoh Group manufacturing subsidiaries	4% reduction (compared to fiscal 2000 figures)	12% reduction (compared to fiscal 1990 figures)
Japan	Ricoh Group non-manufacturing subsidiaries	4% reduction (goals for each company)	—
Outside of Japan	Ricoh Group manufacturing subsidiaries	4% reduction (compared to fiscal 2000 figures)	10% reduction (compared to fiscal 1998 figures)

The Ricoh Group's Targets for Reducing Greenhouse Effect Gases Other Than CO_2 (Manufacturing, Total Amount Emitted)

	Target for fiscal 2010
The Entire Ricoh Group	10% reduction (compared to fiscal 1995 figures)

● Review of Fiscal 2006

CO_2 emissions at production sites increased 3.3% at home and 14.2% abroad over fiscal 2000 levels (see graphs ❶ and ❹). This was because the increased energy consumption caused by the larger production of consumables supplied in Japan and the larger production of products and parts in China more than offset the amount of energy saved by efforts to reduce CO_2 emissions mainly through innovation in manufacturing processes. CO_2 emissions at non-production sites in Japan decreased approximately 4.1% over the previous fiscal year's levels (see graph ❷). While Ricoh aims to reduce total emissions by 12% over the figures in fiscal 1990, it achieved a 2.5% reduction in fiscal 2006. However, this represents a 13.9% reduction in real terms, because Ricoh will introduce CDM to cope with any increase in CO_2 emissions caused by business growth of over 4% per year and changes in CO_2 emissions conversion coefficients. As for greenhouse gases other than CO_2, the semiconductor business division achieved a 29.0% reduction and the entire Ricoh Group a 16.3% reduction over fiscal 2000 levels (see graph ❺).

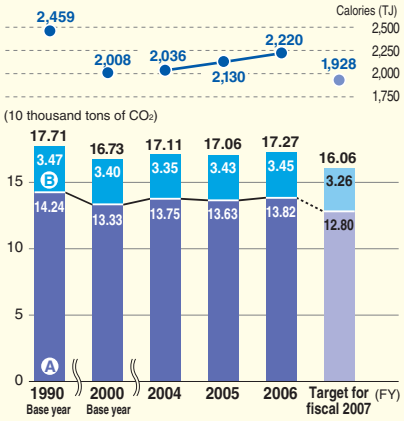
● Future Activities

In promoting activities to expand its business in fiscal 2007 and thereafter, Ricoh will strive to innovate production processes to reduce energy consumption in manufacturing, as part of its efforts to continue reducing CO_2 emissions at production sites. Particular emphasis will be placed on the supply sector and the parts business in China, which have shown marked growth. Positive efforts will be made also to introduce high-efficiency facilities and new energy sources to make investment more effective and operations more efficient. In distribution, detailed data will be collected and analyzed so that effective efforts can be made to reduce costs and CO_2 emissions at the same time.

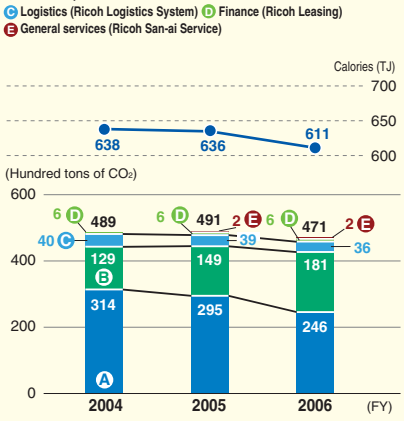
<Japan>

Energy Consumption (CO_2 conversion and calories)

❶ The Ricoh Group (production)



❷ The Ricoh Group (non-production)



Breakdown of Major Energy Consumption

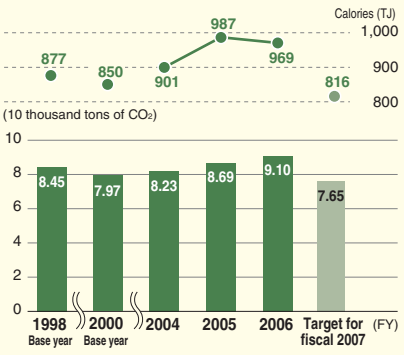
❸ The Ricoh Group (production)

	FY 2003	FY 2004	FY 2005	FY 2006
Kerosene (kℓ)	6,652	5,989	2,205	1,525
Heavy oil A (kℓ)	2,819	2,748	2,701	2,730
Town gas (1,000 m³)	14,640	15,339	15,400	15,899
Natural gas (1,000 m³)	0	0	6,079	7,219
Electric power purchased (1,000 kWh)	289,770	295,042	274,273	291,276

<Outside Japan>

Energy Consumption (CO_2 conversion and calories)

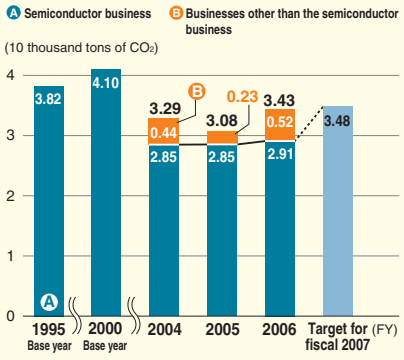
❹ The Ricoh Group (production)



<The Entire Ricoh Group>

Greenhouse Gas Emissions other than CO_2* (CO_2 conversion)

❺ The Ricoh Group (production)



* NF_3 and substances that have a global warming effect and designated in the Kyoto Protocol

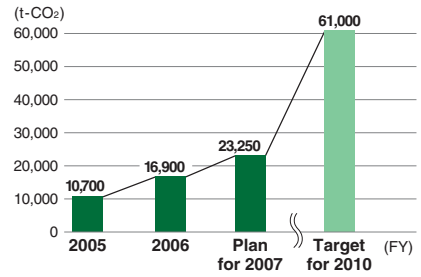
* The following CO_2 emissions coefficients are used in the graphs above.
❶, ❷, and ❺: Guidelines for accounting and reporting of greenhouse gas emissions from industrial commercial sectors (2003) by the Japanese Ministry of the Environment
❹: GHG Protocol
* Data on Ricoh Printing Systems and Shanghai Ricoh Digital Equipment are not included in graphs ❶ through ❸.

Setting a Target for CO_2 Reduction through Improvements in Business Activities

<Ricoh Group (Japan)>

To ensure that we achieve the goal of reducing CO_2 emissions by 12% by fiscal 2010, it is necessary to make systematic reduction efforts. In 2003, Ricoh estimated growths in business up to 2010, and set a target for CO_2 reduction through improvements in business activities without relying upon CDM at around 61,000 tons. By clarifying a mid-term reduction target, activities can be implemented systematically, although it may be a long time before the effects appear after we start the project. In fiscal 2006, CO_2 emissions were reduced by about 6,200 tons mainly through innovations in production processes.

Total Reduction in CO_2 through Improvements in Business Activities



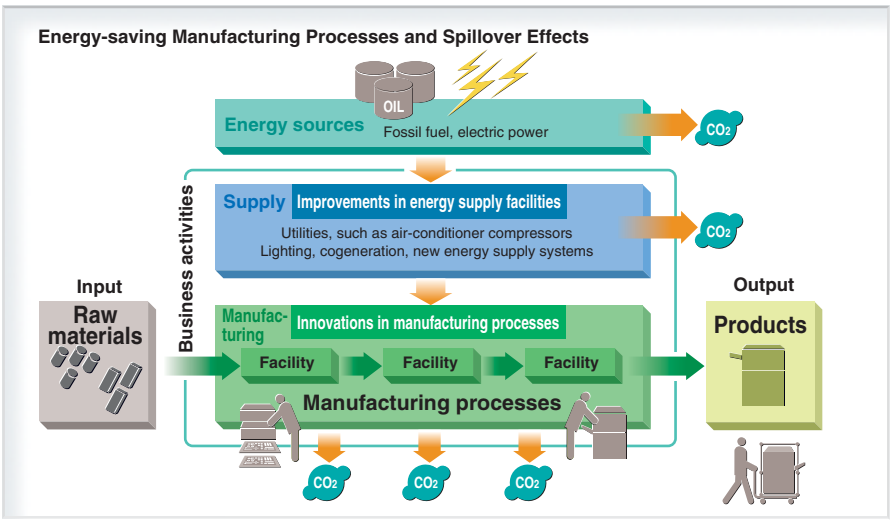
Innovations in Manufacturing Processes

Innovations in Manufacturing Processes to Achieve the Goal of CO_2 Reduction

<Ricoh Group (Japan)>

To achieve the ambitious goal of reducing CO_2 emissions 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 on reducing CO_2 emissions. Focusing on innovations in manufacturing processes may save energy at downsized production lines and have a spillover effect on associated equipment, such as air conditioners and air compressors, at production lines. To date, downsized production lines for photosensitive materials used in copiers have been put in operation, and a dramatic reduction in the size of toner filling devices, and innovation in the toner crush line process have been achieved.

Energy-saving Manufacturing Processes and Spillover Effects



Process Innovation in Toner Pulverizing Line

<Ricoh (Japan)>

Of the CO_2 generated in the production process for toner, which is a consumable used in copiers and printers, about 80% is generated in the toner pulverizing and classification processes. Small-particle size toners are a key product today. The conventional production method for small-particle size toners, however, needs more energy than for coarse toners. We assessed that it would be possible to reduce CO_2 emissions significantly if the high-efficiency production method used for coarse toners could be applied to the production of small-particle size toners, and started to develop a new production process. We succeeded in producing small-particle size toners in a short period of time, making the most of quality engineering and computer simulation to address various technical problems relating to quality and productivity, while achieving improved productivity by shortening the process. As a result of the innovations in the toner production method, we reduced CO_2 by 477 tons and cut costs by about ¥20 million in fiscal 2006.

Line spacing was also significantly reduced thanks to the new method.

Introduction of High-efficiency Equipment

CO_2 Reduction by Cogeneration System and Fuel Switch

<Ricoh Fukui Plant (Japan)>

Fukui Plant carried out a fuel switch from kerosene to natural gas and introduced a gas-engine-type cogeneration system, which has been in operation since July 2005. Subsidies from the New Energy and Industrial Technology Development Organization (NEDO) System were used to introduce the system. In introducing the system, a natural gas satellite was installed so that the natural gas could be supplied by tanker trucks because the infrastructure for supplying natural gas was not available at that time. The introduction of the system accompanying a natural gas satellite was the first such project in the Hokuriku District and served as a model case for the region. The total CO_2 reduction effect in fiscal 2006 was approximately 4,625 tons, including the amount reduced by the fuel switch.

Natural gas supply by tanker trucks

Introduction of Air Exchanger

<Ricoh Industrie France S.A.S. (France)>

Ricoh Industrie France S.A.S. (RIF), a manufacturing subsidiary in France, introduced an "air exchanger" into the thermal paper production line in September 2006. To produce thermal paper, base paper is coated with a heat sensitizer, which is dried with a drier, and the process is repeated. Driers have been installed at four spots along the manufacturing line at RIF. An air exchanger is a mechanism that uses waste heat generated by a drying process in another drying process that heats new air. The volume of natural gas used in the drying processes can be reduced using this mechanism. The reduction in the volume of natural gas used by the driers will result in a reduction in annual CO_2 emissions of 420 tons. It is also expected to reduce costs by 75,000 euros a year.

Air exchanger

Introduction of Natural Energy

Introduction of Solar Panels in the New Plant

<Ricoh Numazu Plant (Japan)>

In October 2006, when the construction of a new toner mass production plant started in Numazu Plant, solar power generation was introduced for the waste water treatment equipment. Using special technology, this equipment has 1,080 solar panels on three faces of its exterior walls, generating approximately 148 MW annually, which is used as a power source for treating waste water. This equipment has resulted in a reduction equivalent to about 56 tons of CO_2.

Waste water treatment equipment with solar panels on the exterior

Full Shift to Green Energy

<Ricoh Europe (Netherlands) B.V. (Netherlands)>

Ricoh Europe (Netherlands) B.V. European Regional Sales Headquarters switched all sources for electricity used at its three business sites in the Netherlands to green energy from January 1, 2007. Traditionally, 20% of the electricity consumed by the company had been generated by green energy. Considering the annual consumption of 1.5 million kWh per year together with the return on investment and added value to company strategies, the management judged a complete shift to hydroelectric power generation would be not only possible but preferable. When switched to the green energy, CO_2 emissions will be reduced by about 1,000 tons per year.

Certificate evidencing use of 100% green energy

Approach for CDM Project

The Clean Development Mechanism (CDM) allows industrialized countries to conduct anti-global warming projects in developing countries, thereby helping those countries comply with their commitment to reduce greenhouse gas emissions 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_2 reduction goals under certain rules, and ultimately such a 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 is actively preparing for CDM as one way of mitigating an estimated 138,000-ton increase of CO_2 resulting from rapid business expansion associated with M&A, etc. and taking changes in external factors such as CO_2 emissions conversion coefficient into account. When selecting CDM projects, Ricoh takes cost performance into account. In addition, by using networks that were created through environmental activities with environmental NPOs, Ricoh tries 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 fiscal 2006, registration with the CDM Committee of the UN was completed for two projects from among wind power generation projects in India. In fiscal 2007, credit will be issued for these projects.

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.

TOPIC

CDM Project Promoted by Ricoh Co., Ltd.

Afforestation Project to Conserve Biodiversity <Ecuador>


Seedling bed of seedlings for reforestation

Although the Choco Manabi Region in Ecuador is famous worldwide for its biodiversity, forests were cut down by stockbreeders who needed pastures for their cows, but afterwards the deforested areas were abandoned as the livestock business in Ecuador went into a recession. Conservation International (CI), an environmental NGO, collects seeds to grow seedlings for reforestation purposes and employs local people to conduct afforestation and maintains/manages virgin forests while giving consideration to biodiversity. Considering biodiversity conservation as a CSR activity, Ricoh started investing in the project in fiscal 2003, while promoting the process of CDM registration in partnership with CI. In February 2007, the methodology of this project was approved by the CDM Committee of the UN.
Unlike other projects that reduce CO_2 emissions, forestation and reforestation projects will serve to absorb CO_2 in the atmosphere, and so this project is expected to expand. However, because the method used to calculate the absorption level is complicated, the methodology* has been approved for only seven projects globally, including this project. The project is the first case of the methodology being approved among the many projects underway through investment solely by individual Japanese corporations. It is also the first project to be approved whose main purpose is biodiversity.

* "Methodology" in this context refers to the method of quantifying/monitoring greenhouse gas reductions in CDM projects. The methodology requires the approval of the CDM Committee.

Bagasse Electricity Generation Project <El Salvador>

Among the number of projects that El Salvador is promoting to reduce its dependence on fossil fuel, electricity generation from bagasse is drawing attention as a new project to contribute to the country's environmental activities. Sugar refining is one of the major industries in El Salvador, and its CO_2 emissions 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. To use bagasse as fuel, factories replaced their generators with high-efficiency boilers or steam turbine generators. Ricoh participated in this project and introduced generators capable of producing a total of 45 MW from 2002 to 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.

Wind Power Project <India>

The rapid economic growth in India has caused concern about the increased number of 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.