Our aim is to bring about an "industrial revolution of the environment" through the development of innovative environmental technologies, thereby realizing a low-carbon society.

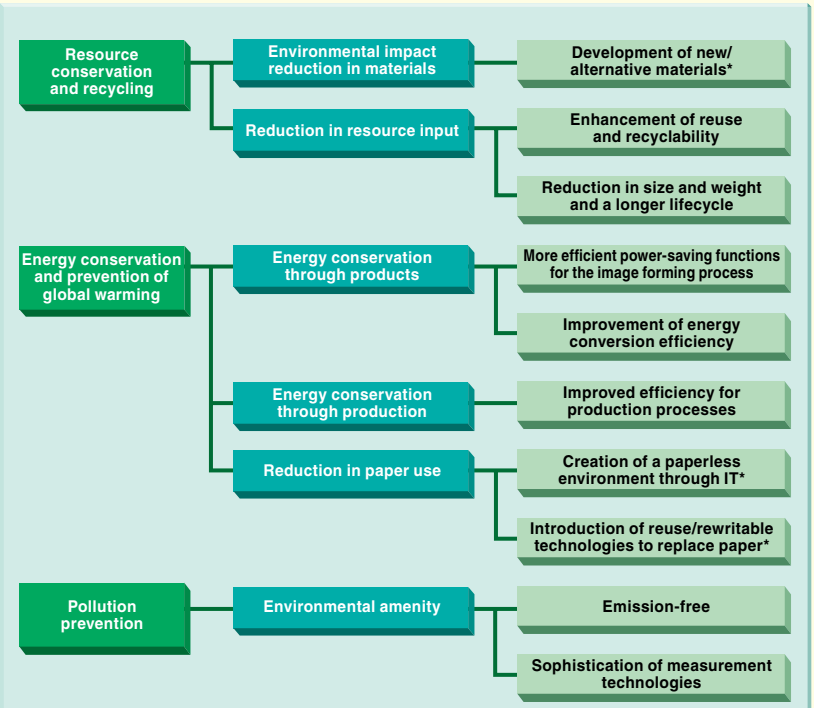
■ Concept of Product Development

The Ricoh Group develops products that—throughout their lifecycles—will keep their environmental impact below the limit at which the global environment becomes unsustainable. First, Eco Balance data on the environmental impact caused by overall business activities are identified and, based on the results, targets for products covered by the action plans are set (Plan). LCA-based designs are then drawn up, and production process technologies are developed to achieve the targets (Do). Results from these designs and process technologies are again reviewed alongside the Eco Balance data (Check) before being reflected in the next targets (Act). In addition to technological development directly related to products, we also work on technological development that will help reduce the environmental impact of society as a whole. We are promoting various activities—such as the development of new/alternative materials, creation of a paperless environment through information technologies, and introduction of reuse/rewritable technologies to replace paper—to further evolve Ricoh's core technologies into environmental technologies that can be applied in a wider variety of areas.

■ Target for Fiscal 2010

◎ Develop environmental technologies that will help reduce the environmental impact of business activities and of society as a whole.

Focused areas for environmental technologies

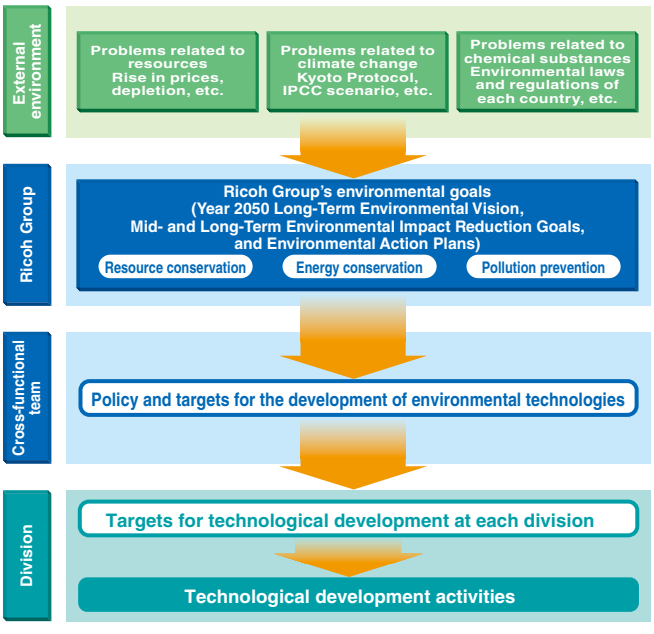


* Technologies that will contribute to environmental impact reduction throughout society.

Acceleration of development of environmental technologies

The development of environmental technologies is one of the most important efforts to realize sustainable environmental management. It is the basis for providing customers with products that are low in environmental impact throughout their lifecycle from the procurement of materials and use by customers to their recycling. It is also the basis for simultaneously realizing both a reduction in environmental impact and the creation of economic value. The Ricoh Group is well aware that existing technologies are not sufficient for creating products that will help resolve the current problems of climate change and resource depletion, meet environmental laws and regulations, and expedite the realization of a low-carbon and resource-recirculating society. Ricoh's development of environmental technologies is based on this recognition. In fiscal 2010, we established new technological targets in order to enhance the environmental values of our business as well as to achieve the Group's 2050 Long-Term/2020 Mid-Term Environmental Impact Reduction Goals, and drew up technological strategies to achieve these new targets. Under the new Environmental Action Plan from fiscal 2011, we will promote the development of even more innovative environmental technologies by enhancing the system to facilitate cross-cutting cooperation between different technology areas, expanding the areas to be considered, and taking other measures. We will make even more effort to develop technologies which will help us achieve our 2020 Mid-Term Environmental Impact Reduction Goals and ultimately reduce the overall environmental impact of society as a whole.

Ricoh's approach to the development of environmental technologies



Promotion of LCA-based design

LCA-based design is a process where targets are set to reduce the environmental impact of products throughout their lifecycles, and the PDCA cycle is used to achieve these targets. Ricoh developed the LCA calculation tool in fiscal 2006 to enable designers to carry out LCA-based design in a more efficient and effective manner. This tool is now actively utilized to conduct LCA for products in the process of development based on their specifications, and, in accordance with the results, set environmental impact reduction goals for each product.

In recognition of its positive contribution to the reduction of environmental impact, Ricoh received the Award of the Director-General of the Industrial Science and Technology Policy and Environment Bureau, the Ministry of Economy, Trade and Industry in December 2010, the highest-ranked prize of an award program organized by the Life Cycle Assessment Society of Japan (JLCA) and sponsored by the Ministry of Economy, Trade and Industry and the Nikkan Kogyo Shimbun Ltd. The program started in 2003 with the aim of recognizing and thereby supporting Japanese corporations and other organizations which work to reduce environmental impact across the entire lifecycle of their products. Ricoh has been working to build and operate LCA systems into product design processes since 1994. We use our original LCA calculation tools in the product development phase, which—together with the collaboration with materials and parts suppliers—allows us to design products with minimal environmental impact. These efforts, as well as environmental technologies development and environmental conservation activities of the Group, led to this honor. The award panel commented that Ricoh won the grand prize primarily for: its long-term, systematic implementation of LCA as part of its product development process; its development and use of original LCA tools and expanded involvement of suppliers; and the development of an LCA system which can be used on a real time basis during the product development process so that product design staff can easily use the system as part of their operations.

Ricoh's General Manager of the Corporate Environment Division Satake at Tokyo Big Sight convention center (left)

Commemorative lecture by a member of the Ricoh LCA-based Design Technology Committee

Life Cycle Assessment (LCA)

LCA means quantitatively identifying which and how much environmental impact exists in the lifecycle of a product, from the resource extraction for the production of raw materials to manufacturing, transportation, marketing, use, maintenance, collection, recycling, and disposal. LCA may also be applied to part of the above cycle.

Disclosure of information using environmental labels

It is important not only to develop environmentally-friendly products through the use of environmental technologies and LCA-based design, but also to disclose information in an easy-to-understand manner. Ricoh is actively engaged in introducing Type I environmental label certifications so that customers will understand that our products are environmentally friendly. We are also working to disclose our environmental information in accordance with Type III environmental declarations.

* For details on environmental labels, refer to our web site: http://www.ricoh.com/environment/label/index.html

Acquiring the first Green Choice eco-labeling certificate in the Philippines

<Ricoh (Philippines) Inc. (Philippines)>

In July 2010, Ricoh (Philippines) Inc. (RPH) became the first company to received the certification of Green Choice Philippines[1], a Type I environmental label program, in the multifunctional printing devices (MFPD[2]) category. RPH was invited to a forum for the sales promotion of Green Choice certified products and environmental and sustainability activities, titled "the Gathering Hands —Sustainability at Work" on July 21, 2010. Aficio MP 1600/1900/2000 L series were displayed in the forum venue to showcase the first certified MFP product series under this national eco-labeling initiative.

1. The National Ecolabelling Programme – Green Choice Philippines (NELP-GCP) http://www.pcepsdi.org.ph/ecolabel.html
2. Multi-function printing devices

Development of alternative materials using biomass resins

<Ricoh Co., Ltd. (Japan)>

As part of its efforts to develop alternative materials to realize a low-carbon and resource-recirculating society, Ricoh is working on the development of components and toners for copiers that utilize biomass resins. Biomass resins have been receiving increasing attention recently as they are recyclable and contribute less to global warming than their petroleum-based counterparts. In 2002, we started development of biomass plastic for application in our copiers, and in 2005, rolled out the industry's first multifunctional digital copier equipped with biomass components (50% biomass content[1]) in its main unit. As collection and recycling of toners after printing is rather difficult, it is important to reduce the environmental impact of their components—currently, petroleum-based resins constitute the primary components. Ricoh has worked on the commercialization of biomass toners since[2] 2006, releasing them onto market in November 2009.

Ricoh plans to continue technical development toward improving biomass content and expanding the use of biomass resins. At the same time, Ricoh plans to search for possibilities toward commercialization of technology for effectively using limited resources in other materials as well as by reducing the use of resources that are highly likely to dry up and focusing on alternative resources.

1. Percentage of biomass resins included in components
2. Designed to be used for Ricoh products

imagio MP 6001GP

History of Ricoh's biomass resin material development

2002	Began developing biomass plastic components as materials for copiers
2005	Became the industry's first to employ plastic with 50% biomass content in the main component of a multifunctional digital copier
2006	Began efforts toward commercialization of biomass toners
2008	Released the imagio MP C2200 model, which employs a newly developed plastic component with roughly 70% biomass content
2009	Released the imagio MP 6001GP, equipped with "for E Toner," and became the world's first manufacturer to employ a biomass toner (25% biomass content)

Development of Technologies for Greener Production Processes

Development of dry washing technology
<Ricoh Co., Ltd. (Japan)>

To make the recycling of used image equipment parts such as toner cartridges more effective, Ricoh successfully developed "dry washing technology" in 2007. The newly developed technology allows toner stains on used cartridges to be removed without using water, by blasting them with tiny sheets of resin film at high speed. In 2009, we succeeded in applying the dry washing technology for the removal of adherents on the mounting of electronic components, and started to introduce it in our production sites around the world. In the automated soldering process for the production of electronic components boards, flux residue will accumulate and become fixed on the pallets over time. Previously, the residue was removed manually with the use of an alcohol-based solvent, which is very labor-intensive and inevitably generates liquid waste. Application of the dry washing technology to pallet cleaning has resulted in shortening the washing time from 120 minutes to less than 5 minutes, eliminated liquid waste generation, and reduced the environmental footprint to one-tenth or less of the previous levels.In fiscal 2010, Ricoh participated in Internepcon Japan, a leading electronics manufacturing technologies trade show, and displayed dry washing machines as a joint exhibit with electronic component manufacturer Tamura Corporation. The exhibit received a great response. Many manufacturing companies visiting the trade show expressed their interest in introducing this technology. Ricoh and Tamura Corporation are considering the commercialization and sales of dry washing technology, which will achieve substantial reduction in cost and environmental impact.

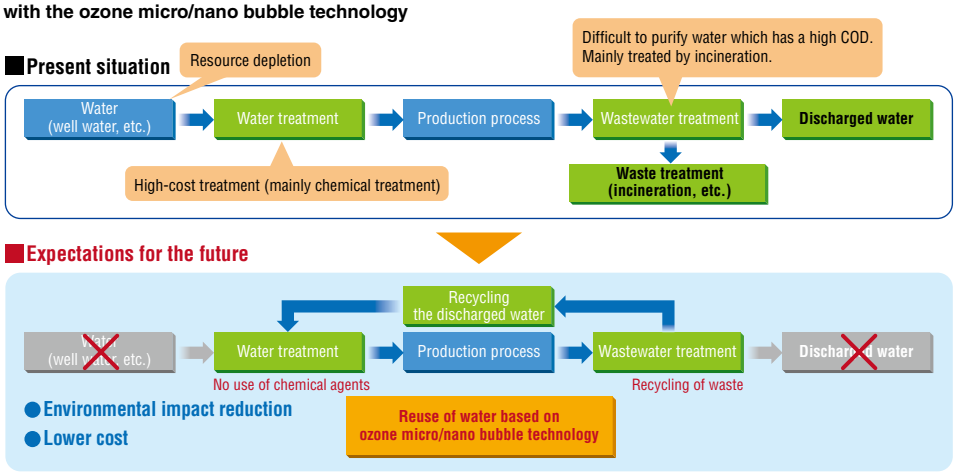
Showcased as a "washing revolution" machine at Internepcon Japan held in January 2011

Developing a next-generation water treatment technology based on ozone micro/nano bubble technology
<Ricoh Co., Ltd. (Japan)>

Ricoh has been developing production process/recycling technologies to reduce the environmental impacts of its production processes. As part of this effort, and specifically to solve the problem of wastewater from the polymerized toner production process, and also in consideration of the risk of possible depletion of water resources in the future, Ricoh began conducting a joint project to develop and make practical use of a technology to recycle water used in manufacturing with REO Research Institute and the Research Institute for Environmental Management Technology of the National Institute of Advanced Industrial Science and Technology. This project was completed in 2010. The next-generation water treatment technology developed in the project by applying REO Research Institute's ozone micro-nano bubble technology can purify waste water from the polymerized toner production process by using energy derived from the bursting of fine ozone bubbles (below 300 nano-meters* in diameter). Water treated through this technology can be reused in the production process, thus providing a closed water recycling system. At present, some wastewater from Ricoh's polymerized toner production process has to be incinerated because it is difficult to break down the water, which contains some very persistent organic matters, by chemical agents. In the closed water recycling system, however, the thermal treatment of the highly concentrated wastewater that is now conducted prior to the purification process will become unnecessary, and both the use of underground water and the amount of water eventually wasted from the process will be substantially reduced. The technology is expected to be applied to a range of production systems as an innovative environmental technology to save water resources and reduce CO_2 emissions. Ricoh aims to complete the closed recycling system for the polymerized toner production process within fiscal 2012.

*Nano-meter: 10^{-9} meter = one-billionth meter

Establishment of technology for recirculating and reusing industrial water with the ozone micro/nano bubble technology



At the Eco-Products 2010 exhibition held in Tokyo Big Sight in December 2010, Ricoh displayed an aquarium in which carp (freshwater fish) and sea bream were swimming together. The nano bubble technology gives unlimited new possibilities to water.