Promoting the development of environmentally-friendly products by setting target values based on the environmental impact caused by overall business activities

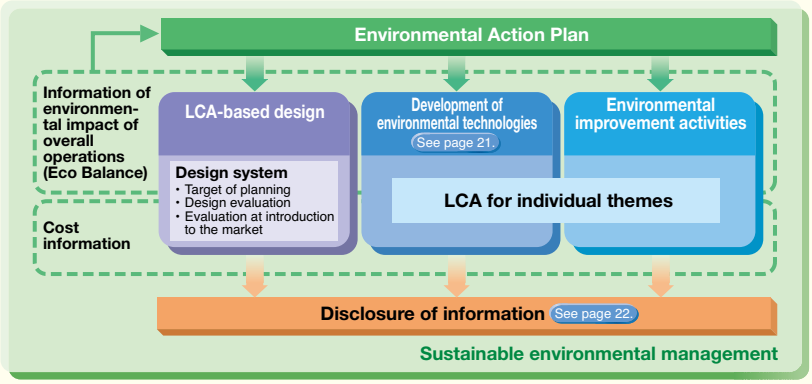
● Concept of Product Development

The Ricoh Group develops products to keep the integrated environmental impact[1] of all products during their life cycles below the limit at which the global environment is sustainable. First, the Eco Balance[2] 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). The design division then draws up LCA-based designs to achieve the targets (Do). Results from the LCA-based designs are reviewed again (Check) before being reflected in development goals for the next models (Action).

The Group is also committed to developing new product materials that effectively reduce environmental impact throughout the product lifecycle and environmental technologies that reduce paper consumption. The Group also discloses relevant information.

1. See page 15. 2. See page 53.

Position of LCA in Sustainable Environmental Management



History of the Development of Environmentally-Friendly Products

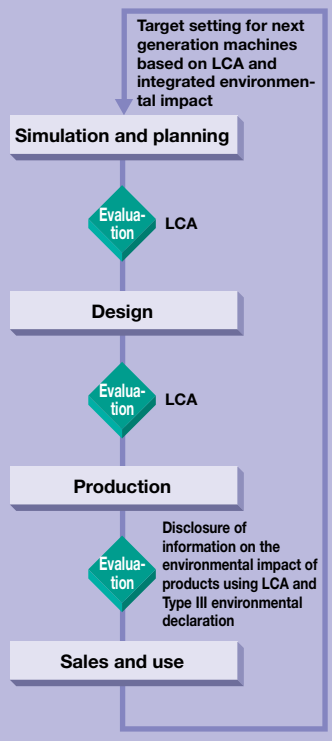
	Activities
1980s–	• Individual environmental standards for products (concerning such items as noise, presence of chemical substances, and energy saving) adopted
1990	• Product Design Committee, Environmental Technology Committee and Eco Mark Committee established.
1994	• The concept of the "Comet Circle" completed. • LCA Study Group established. • LCA activities under individual themes to reduce the environmental impact of each product and overall operations promoted.
1998	• The concept of Eco Balance introduced. • Environmental Action Plan based on the Eco Balance prepared. • The Ricoh Group starts to build the Environmental Impact Information System.* *See page 51.
2000	• The Environmental Impact Information System completed. • The Ricoh Group begins to disclose information on environmental impact of products that was compiled based on the LCA (Type III Environmental Declaration). • The Ricoh Group begins to integrate data on environmental impact caused by each product and by overall operations.
2002	• Environmental Action Plan prepared based on integrated environmental impact.
2003	• The Ricoh Group clarifies the concept of LCA-based design, and begins to improve the system and tools to promote the concept.
2004	• Digital camera with an LCA-based design launched • Launch of products in which environmentally-sensitive substances specified by Ricoh have been eliminated
2005	• LCA calculation tool for designers developed

Lifecycle Assessment (LCA)
LCA means quantitatively identifying which and how much environmental impact exists in the lifecycle of a product, from the gathering of resources 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.

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. To effectively reduce the environmental impact of all its products over generations, the Ricoh Group quantifies targets for reduction by "integrated environmental impact" and promotes LCA-based designs. In addition, the Group is developing a CAD system and LCA calculation tool to facilitate the design process.

LCA-based Design Process



● A System for Efficient Promotion of LCA-based Design

CAD System for LCA-based Design

The Ricoh Group introduced its own CAD system to prevent the erroneous designations of materials whose environmental safety has not been verified, or materials that do not conform to the recycling plan, in a drawing prepared by a person in charge of design. The system is interlocked with a database that contains not only information on costs and quality of materials but also information on environmental conservation, such as the use of environmentally sensitive substances and recyclability. In fiscal 2005, the Ricoh Group developed an LCA calculation tool for designers and started using it to design some of its copier models. This tool is planned to be adopted to design all models of copiers in fiscal 2006.

Assessment System for LCA-based Design

Ricoh is developing an operational system, based on data collected by the sustainable environmental management information system to manufacture products that are environmentally friendly throughout their life cycles. This system is utilized in environmental impact assessments by unit and by part as well as for preparing EcoLeaf Type III environmental labels to disclose products' LCA information.

Assessment of Recyclable Design

More efficient reuse and recycling can be realized by simplifying the disassembling and sorting of products collected after use and choosing raw materials that are easily recyclable or contain less environmentally-sensitive substances. In 1993, Ricoh announced its "policy on recyclable design" aimed at reducing the time and cost of recycling by, for example, reducing the number of parts and standardizing materials. Ricoh also applied "recyclable design" and a "product assessment system" to its entire line of copiers, multifunctional copiers, facsimiles, and laser printers. Following the improvements made at some stages, Ricoh implemented level 6 of its recyclable design policy in fiscal 2003.

INTERVIEW

Employee Interview | Tool Created to Help Perform More Effective LCA Calculations

Development of an LCA Calculation Tool for Designers—Newly Developed Tool Allows Designers to Conduct LCA on Computers

Isao Ogata
Business Strategy Center, MFP Business Group

User-friendly tool: For most items, designers can choose from among several constant values

Time and labor required to perform LCA calculations significantly reduced

Ricoh takes the entire product lifecycle into consideration when developing environmentally-friendly products. Recently, we created an LCA calculation tool that allows designers to easily conduct LCA on computers to promote more efficient LCA-based designs. Under the conventional method, designers had to collect and manually input more than 60 items of data to calculate LCA. This method was very time consuming and burdensome to designers. The newly developed LCA calculation tool for designers substantially reduces the number of items of data needed to be input manually by increasing the number of items stored in the software, enabling designers to simply choose from among several constant values. The constant values are revised as necessary based on empirical data to maintain calculation accuracy. Designers now have to manually input only about 15 items, and calculation takes approximately three minutes, thus significantly reducing time and labor.

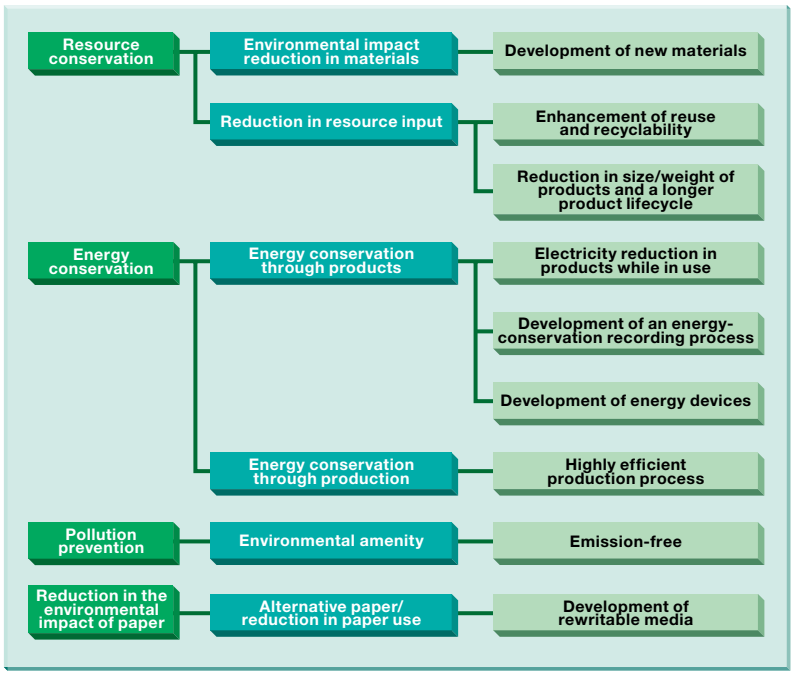
Do products that have an environmental advantage have a cost advantage, too? This is something we would like to verify.

Because the new tool enables designers to run a comparative simulation using their creativity and ideas about environmental impact reduction, they are expected to come up with designs that are more environmentally friendly than ever. We are now ready to proceed with setting detailed reduction targets and developing model-specific technologies. Moreover, we hope that subsequent LCA using this tool will verify our hypothesis that products that have an environmental advantage also have a cost advantage. I believe that a common basis of manufacturing, such as quality improvement and cost reduction, is not in conflict with environmental friendliness. It is important in environmentally-friendly manufacturing for designers to smoothly incorporate the LCA concept into their day-to-day work.

Promotion 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 unobtrusively contribute to a reduction in environmental impact while in use" and for simultaneously realizing both a reduction in environmental impact and the creation of economic value. The Ricoh Group has established medium- and long-term plans for the four fields, namely, "energy conservation," "resource conservation and recycling," "pollution prevention (environmental comfort)," and "reduction in paper use in printing/copying." Not only the R&D Division but also all business divisions and affiliates are engaged in developing environmental technologies and products. In fiscal 2005, we made progress in the development of new product materials.

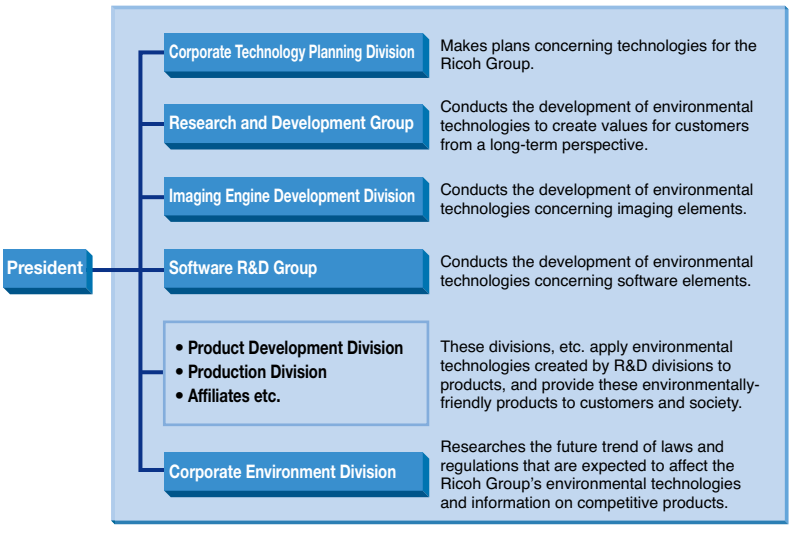
Focused Areas for Environmental Technologies



Putting Plant-Based Plastic into Practical Use* in Copiers

The Ricoh Group, in collaboration with Mitsui Chemicals, Inc., has cleared technical hurdles associated with plant-based plastic, such as crashworthiness and fire retardancy. We have successfully developed and put into practical use a new plastic material that is made from corn and has a high percentage of plant-based material (more than 50%). We used this new plastic for part of our digital copier, imagio Neo 602ec/752ec, for the first time in the copier/printer industry. *See page 9.

Structure to Develop Environmental Technologies



(The Ricoh Group's) Environmental Technology Committee

Development of Color-Rewritable Media

Ricoh, using a photochromic compound, has developed a new medium to control color development with light. When light is applied to the photochromic compound, its chemical structure changes according to the wavelength of the absorbed light, producing coloration and decoloration. By individually controlling substances, each one of which produces one of three primary colors (yellow, magenta, or cyan), vivid full color display becomes possible. This technology may lead to the development of media such as papers and films on which color images can be rewritten a number of times. Rewritable media may reduce paper consumption by a significant margin. Right now, we are studying the stability of coloration so that developed color images are not weakened by the light applied.

Disclosure of Environmental Information of Products

The main purpose of disclosing environmental information of products is to inform customers of the excellent environmental performance of Ricoh's products. In addition, it is also important to inform society of Ricoh's environmental conservation activities and their results, and disclose environmental information in a positive manner. For this purpose, Ricoh is firmly committed to publicizing the results of LCA studies, technology development, and evaluation methods at academic societies and conferences. Furthermore, Ricoh is contributing to the formation of various environmental labeling in the world, and is making an effort to acquire various certifications.

● Disclosure of Information Using Environmental Labels

Type I Environmental Labels

Type I environmental labels have been established in countries and regions pursuant to ISO 14024 standards. These labels, which are placed on products and shown in brochures, help customers decide which products to buy. Ricoh's criteria for product design used to promote global green marketing are actually more severe than those set by the international Type I environmental label. Moreover, Ricoh actively contributes to establishing Type I environmental labeling criteria in many countries. In fiscal 2005, Ricoh acquired Ten Circle, China's environment label. In accordance with a revision to Eco Mark criteria for copiers in August 2005, Ricoh is gradually launching products that meet the new criteria.

Type II Environmental Labels

Type II environmental labels are given to products that satisfy standards independently set by each company. The Ricoh Group has defined the Recycle Label, and has set its own standards for recyclable designs, reuse rate of parts, and environmental safety.

Recycle

* For details, refer to the following Web site.
http://www.ricoh.com/environment/label/type2/index.html

Type III Environmental Declaration

As green purchasing is increasingly popular at present, the timely and global disclosure of information is increasingly important, not only for the selection of products by customers but also for sustainable environmental management by the Ricoh Group. The Ricoh Group, following the Type III Environmental Declaration, continuously endeavors to quantify the environmental impact of products using LCA and discloses this information. In addition, the Ricoh Group is making efforts to promote the Type III Environmental Declaration. In fiscal 2005, the Ricoh Group obtained Eco Leaf Type III environmental label for its recycled multifunctional digital copier, imagio Neo 350RC/450RC, which means that this model has acquired all eco labels, including types I, II, and III.

International Environmental Labels for which the Ricoh Group Qualifies

* Type I Environmental Labels http://www.ricoh.com/environment/label/type1/index.html

● Eco Mark* Japan	3R・省エネ設計 An example of the Eco Mark on an imagio MP C3000 series model (certification no. 05117022)	● Blue Angel* Germany	
● Green Label* Thailand		● Environmental Choice Program (ECP) Mark* Canada	
● International Energy Star Mark Japan, the United States, Europe, etc.	ENERGY STAR	● Green Mark* Taiwan	
● Environmentally Friendly Label* Hungary		● Environmental Choice* New Zealand	
● Energy Efficiency Labeling Scheme (EELS) Hong Kong	ENERGY LABEL	● China Environmental Label* (Ten Circle) China	