We aim to establish an environmental accounting system to evaluate sustainable environmental management and support managerial decision making.

Thanks to its environmental accounting system, which was disclosed for the first time in 1999, the Ricoh Group has built up a good reputation. However, it is necessary to further improve this environmental accounting system as a managerial decision-making tool. We will utilize the Segment Environmental Accounting and Business Sector Environmental Accounting as internal accounting tools as well as Corporate Environmental Accounting, to promote sustainable environmental management. We will further upgrade the system so that it can be used in mapping out environmental action plans, selecting measures, and confirming achievements.

Utilization of Environmental Accounting

Environmental accounting is used to determine measures to promote sustainable environmental management.

Reducing environmental impact using measures that will lead to the creation of benefits is crucial to promoting sustainable environmental management. The Ricoh Group uses environmental accounting to determine what measures should be taken for what processes and for what operations so that the maximum effect can be obtained. Therefore, we first identify those processes that have a high environmental impact in business operations, based on the Eco Balance*. We examine a number of improvement plans to reduce the identified environmental impact, in consideration of developments in society and laws/regulations and competition. Then, using segment environmental accounting, we assess the effectiveness of each possible approach and decide what methods should be adopted to gain the best results.

*See page 53.

INTERVIEW

Employee Interview | Environmental Accounting Useful in Decision Making in Sustainable Environmental Management

We will strive to link environmental accounting and the environmental action plan and use them as a tool to promote sustainable environmental management.

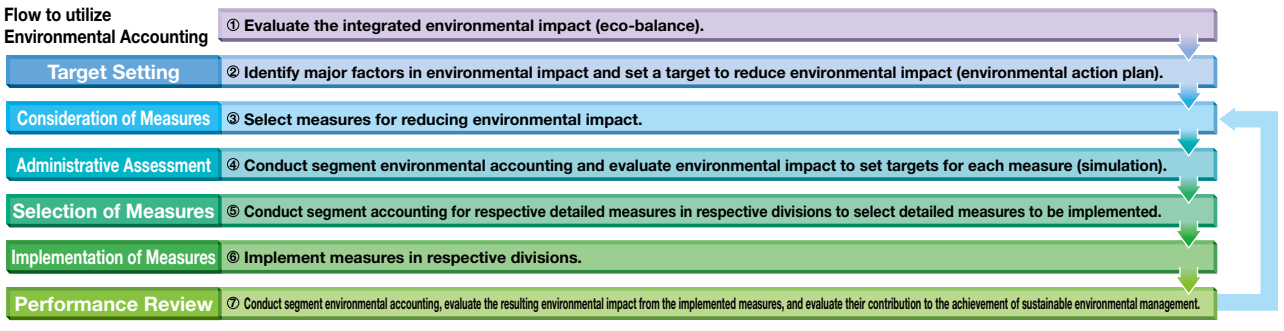
Keiichi Ikebe
Sustainable Environment Strategy Office, Corporate Environment Division

The tool will be used to understand how far the environmental action plan has been realized and to map out a new plan.

The Ricoh Group has an extra-long-term environmental vision to reduce environmental impact generated by all businesses of the Group to one-eighth in terms of absolute value by 2050. We are striving to achieve this target by improving the level of sustainable environmental management. Improvements in the sustainable environmental management level mean that environmental impact is reduced while economic effects are enhanced as a result of promoting environmental conservation activities. So far, we have used environmental accounting as a tool to ascertain the consequential cost-effectiveness of activities, including those that save energy and promote recycling. When mapping out the environmental action plan, which was to start from fiscal 2005, we ran a simulation of the reduction in environmental impact and the creation of profit compared with the costs of each measure to be implemented. We are currently trying to determine the actual results. This will allow us to see even more clearly how far environmental conservation and profit creation are simultaneously realized, and we will be able to promote our activities.

To upgrade environmental accounting into a tool that can be used to promote sustainable environmental management for the entire business as well as at company level

The Ricoh Group is engaged in a variety of business categories. Processes that have a large environmental impact differ according to business category. For example, it is known that resources and energy used in manufacturing are large in the thermal business, including the production of thermal paper. Indicators that are appropriate when measuring sustainable environmental management differ among business categories. In the future, we will promote discussions on indicators that are appropriate to respective sectors other than the thermal business.



Corporate Environmental Accounting

This is a tool to inform the public of relevant information compiled in accordance with the Environmental Accounting Guidelines of Japan's Ministry of the Environment. The Ricoh Group takes the necessary portion from the Eco Balance data, and calculates the cost and effect (in quantity and monetary value) of its environmental conservation activities based on its own formulas and indicators. The calculated results are disclosed to the public after being verified by a third party organization. We will continue to improve the accuracy of the information to be disclosed and will make a positive effort to make it comparable to already standardized documents, such as financial statements.

Segment Environmental Accounting

This is an internal environmental accounting tool to select an investment activity, or a project, related to environmental conservation from among all processes of operations, and to evaluate environmental effects for a certain period. The effect of investment on environmental conservation will be calculated based on the concept of "Return on Investment" (ROI). The calculation result is used internally for decision making in sustainable environmental management. Ricoh Group companies and divisions, such as its recycling business division, increasingly utilize segment environmental accounting for their operations.

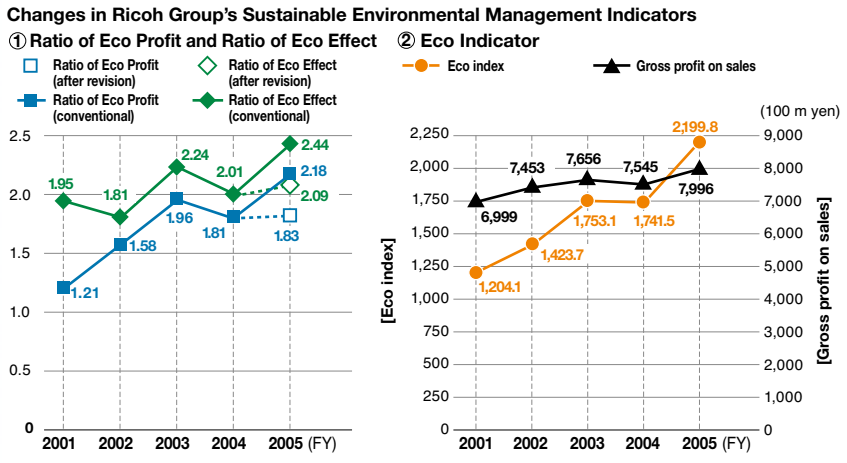
Business Sector Environmental Accounting

The Ricoh Group engages in environmental activities in many business sectors. This is an indicator of how such environmental activities contribute to environmental management conditions in respective business sectors. Because the properties of operations differ by business sector, we have repeatedly discussed which indicator would be appropriate for a given sector.

Review of Corporate Environmental Accounting for Fiscal 2005

During the fiscal year, we reconsidered our method of calculating incidental effects because it became apparent that the conventional method could cause an overestimation. "Ratio of Eco Profit" and "Ratio of Eco Effect," indicators of the cost-effectiveness of sustainable environmental management activities, have been calculated using a new calculation method (see the dashed lines in graph ①). The results obtained under the conventional method improved from those for fiscal 2004 (see the solid lines in graph ①). We will basically use the new method in the future. The Eco Index, which indicates the level of sustainable environmental management for the entire business, considerably improved in fiscal 2005 from fiscal 2004 thanks to significant decreases in the final waste disposal amount and emissions of chemical substances subject to PRTR as well as an increase in gross profit on sales (see graph ②). Corporate environmental accounting data show that upstream and downstream costs decreased while administration costs increased. As for economic effects, those from sales of recycled products have grown significantly. On the other hand, environmental conservation effects could not offset increases in CO_2 and NOx, which reflected the growth of the business, although the Ricoh Group as a whole is striving to improve its manufacturing processes, aiming to save energy and resources. We, however, succeeded in reducing the final waste disposal amount and emissions of chemical substances subject to PRTR, which allowed us to reduce social costs significantly from fiscal 2004. Also, environmental impact of the Ricoh Group as a whole fell 16%. In the future, we will endeavor to reduce environmental impact to a further degree and promote efforts toward the realization of sustainable environmental management.

Changes in Ricoh Group's Sustainable Environmental Management Indicators



Ricoh Group's Sustainable Environmental Management Indicators (Fiscal 2005)

Sustainable environmental management indicators	Results in fiscal 2005	Calculation formula
REP : Ratio of Eco Profit	1.83*	Total economic benefit (29.27) /Total environmental conservation cost (15.98)
REE : Ratio of Eco Effect	2.09*	{Total economic benefit (29.27) + Amount of reduction in social costs (1.16+2.90)}/Total environmental conservation cost (15.98)
Eco Index	2,199.8	Gross profit on sales (¥799,600,000 thousand) /Total environmental impact (363,491)
RPS : Ratio of Profit to Social cost	150.6	Gross profit on sales (799.6) /Total social cost (5.31)

* Represents results after the revision to the method of calculating incidental effects

* Monetary units are indicated in billions of yen unless otherwise indicated.

Ricoh Group's Corporate Environmental Accounting in fiscal 2005

Environmental conservation costs are classified according to "Categories corresponding to business activities" defined in the "Environmental Accounting Guidelines 2005" of the Ministry of the Environment.

Costs refer to expenditure on environmental conservation activities (in a broad sense), and consist of environmental investments and environmental costs (in a narrow sense).

● Environmental investments
These investments correspond to "investments in fixed assets" in financial accounting. The amount of environmental investments is distributed as environmental costs over the service life of fixed assets in accordance with depreciation procedures.

● Environmental costs
These environmental costs correspond to the "period cost" in financial accounting. (Depreciation cost of environmental investments is included.)

Cost unit: ¥100 million (Exchange rate: $1 = ¥113.26 €1 = ¥137.86)

Item	Costs			Economic Benefits		
	Environmental Investments	Environmental Costs	Main Costs	Monetary Effects	Category	Item
Business area costs	7.2	23.3	Pollution prevention cost ····· ¥490 million Global environmental conservation cost ····· ¥770 million Resource circulation cost ····¥1,070 million	5.8	a	Energy savings and improved waste processing efficiency
				50.5	b	Contribution to value-added production
				11.3*	c	Avoidance of risk in restoring environments and avoidance of lawsuits
Upstream/ Downstream costs	0.1	59.9	Cost of collecting products, turning recycled materials into saleable products, and so forth	147.1	a	Sales of recycled products, etc.
				[25.3]	S	Reduction in society's waste disposal cost
Administration costs	0.6	45.7	Cost generated by the division in charge of environmental conservation; cost to establish and maintain an environmental management system	13.9	b	Effects of media coverage and environmental education
Research and development costs	2.3	23.1	Research and development costs for environmental impact reduction	54.3	a	Contribution to gross margin through environmental research and development
				[3.7]	S	Reduction in user's electricity expenses thanks to an improved energy saving function and product performance
Social activity costs	0.0	6.4	Costs of preparing environmental reports and advertisements	9.9	b	Publicity from environmental advertisements, etc.
Environmental remediation costs	0.3	1.5	Costs of restoring soil and environment-related reconciliation	—	—	None
Other costs	0.0	0.0	Other costs for environmental conservation			
Total	10.5	159.8		292.7	Sum of a: 207.1, b: 74.3, and c: 11.3.	
				29.0	Total S's	

a: Substantial effect
b: Expected effect
c: Incidental effect
S: Social effect (Customer benefits)

- **Environmental investment rate: 2.6%**
  [= environmental investment (10.5)/total investment (400.7)]
- **Environmental R&D cost rate: 2.1%.**
  [= Total environmental R&D cost (23.1) /Total R&D cost (1,103)]

* Represents results after the revision to the method of calculating incidental effects

Economic benefits refer to benefits that were obtained by environmental conservation activities and which contributed to the profits of the Ricoh Group in some form. Economic benefits are classified into four categories as follows:

● Substantial effect (a)
This means economic benefits that fall into either of the following two cases:

1) Cash or cash equivalent is received as a benefit. This corresponds to "realized gain" in financial accounting.
2) The amount of savings in such costs that would have occurred if environmental conservation activities had not been conducted. This amount is not recognized in financial accounting.

● Expected effect (b)
The expected amount of contribution in the case that expenditure on environmental conservation activities is assumed to have contributed to profits for the Ricoh Group. If environmental conservation costs are assumed to be costs that are indispensable for the Ricoh Group to conduct its operations, for example, it can be safely said that such cost contributed to profit in some form. In practice, the expected effect is computed by a certain formula for each item.

● Incidental effect (c)
Expenditure on environmental conservation activities can help avoid the occurrence of environmental impact. Therefore, it can be safely said that the expenditure contributed to the avoidance of such damage of environmental impact that would have taken place without the expenditure. In practice, the incidental effect is computed by multiplying the expected amount of damage by an occurrence coefficient and impact coefficient.

● Social effect (S)
Social effect means such effect that is generated by expenditure on environmental conservation activities not for the Ricoh Group but for society. In practice, social effect means the amount of reduction in the expense of electric power and waste disposition that is enabled through environmentally-friendly products for customers.

* For the computation formulas, see page on the right.

Effect on environmental conservation means the effect of activities to prevent and control the occurrence of environmental impact and to eliminate and remove such environmental impact. The Ricoh Group reports the amount of reduction in the emission of substances with serious environmental impact for the current year as compared with the previous year (=emissions in the previous year – emissions in the current year).

● Conversion Coefficient
This is a weighting coefficient that is used in identifying environmental impact by totaling and weighting various types of environmental impact expressed in different units (CO_2 = 1). Values of coefficients are based on the Swedish EPS method.

● Converted Quantity of Reduction/Converted Quantity of Impact
Converted quantity of reduction is obtained by multiplying environmental impact reduction by conversion coefficients and converted quantity of impact by multiplying total environmental impact by the coefficients. In other words, these values refer to the degree of seriousness of such environmental impact reduction and total environmental impact that are converted into figures in t-CO_2.

● Social Cost Reduction Values/Social Costs
Social cost reduction values represent financial figures obtained by converting the converted quantity of reduction into money and social costs by converting the converted value of impact into money. Computations are made using the factor of 108 Euro/t-CO_2 of EPS Ver2000.

This is the quantity of substances with environmental impact emitted by the Ricoh Group in the current fiscal year.

Effect on Environmental Conservation				Environmental Impact			
Environmental Impact Reduction (t)	Conversion Coefficient	Converted Quantity of Reduction	Social Cost Reduction Values	Total (t)	Conversion Coefficient	Converted Quantity of Impact	Social Costs
Environmental impact reduction at business sites							
CO_2 ..... –4,850.2	1.0	–4,850	–0.72	CO_2 304,049	1.0	304,049	44.41
NO_x ..... –1.3	19.7	–27	–0.00	NO_x 173	19.7	3,411	0.50
SO_x 0.6	30.3	19	0.00	SO_x 9	30.3	270	0.04
BOD 3.2	0.02	0.1	0.00	BOD 6	0.02	0	0.00
Final waste disposal amount 549.1	104.0	57,108	8.50	Final waste disposal amount 292	104.0	30,360	4.43
PRTR substance emissions ..... (Ricoh standards per substance)		25,438	3.79	PRTR substance emissions ..... (Ricoh standards per substance)		25,401	3.71
Environmental impact reduction through products CO_2 ..... 5,733.9 (t) NO_x ..... 4.7 (t) SO_x ..... 3.7 (t) Final waste disposal amount ··· 31,660 (t) Calculation for companies in Japan only							
		77,688	11.56			363,491	53.10

Data coverage

- **Companies: 90 Ricoh Group companies.** See page 74.
- **Period: From April 1, 2005 to March 31, 2006 (for costs and total environmental impact).**

* Social cost is calculated using the factor of 108 Euro/t-CO_2 (14,889 yen/t-CO_2).

* Environmental impact reduction represents the difference between figures in fiscal 2004 and fiscal 2005.

(1) Formula of Substantial Effect

Reduction in heat, light, and water cost	Heat, light, and water expenses in the previous year – heat, light, and water expense in the current year
Reduction in waste disposal cost	Waste disposal expenses in the previous year – waste disposal expenses in the current year
Sales value of valuable materials	Sales value of valuable materials sorted from waste
Sales of recycled products and parts	Sales of recycled products and parts
Subsidies	Environmental subsidies from the government, etc.
R&D profit contribution amount	Product gross margin × gross margin contribution rate calculated using environmentally-friendly points

(2) Formula of Expected Effects

Contribution to value-added production	(Production output – raw material costs) × business area cost/manufacturing costs
Effects on media coverage	Area of newspaper advertisement/newspaper page area × advertisement cost per page
Effects of environmental education	Number of people attending internal environmental education seminars × seminar fee for outside participants
Publicity from environmental advertisements	Number of visitors to environmental Web site × unit price of the sustainability report

(3) Formula of Incidental Effects

Amount of incidental effects	Standard amount × occurrence coefficient × impact coefficient
Items to be calculated	Areas of improvement to prevent pollution
Standard amount	Amount set aside for lawsuits, suspension of operations, and restoration
Coefficient	Occurrence coefficient and impact coefficient to be set according to occurrence frequency and affected extent

(4) Formula of Social Effects (customers' economic benefits from using products)

Total electric power	Electric power consumption of a product × number of products sold
Electric power cost reduction effect	(Total electric power for old models – total electric power for new models) × electric power unit cost
Waste disposal cost reduction effect	(Weight of collected products – weight of final waste) × outside disposal unit cost