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

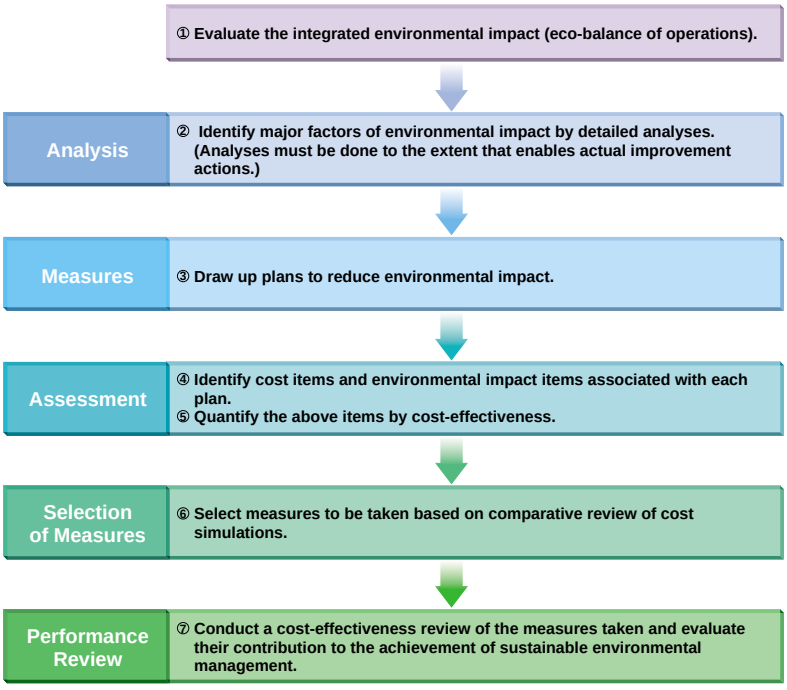
Thanks to its environmental accounting system, which was disclosed for the first time in 1999, the Ricoh Group has built up a good reputation. However, it is necessary to further improve this environmental accounting system as a managerial decision-making tool. We will internally utilize the Segment Environmental Accounting and the Eco Balance Environmental Accounting System to promote sustainable environmental management. From now on, we will make an effort to improve and enhance the environmental accounting system so that the system may be used as a sustainable environmental management indicator to accurately evaluate environmental conservation activities.

Utilization of Environmental Accounting

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

Implementing measures that strike a balance between cost reduction and environmental impact reduction 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 are costly and have a high environmental impact in business operations, such as toner and semiconductor and thermal products, based on the Eco Balance environmental accounting for each operation. We examine a number of improvement plans to reduce the identified environmental impact through economically rational approaches. 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. In our toner business, for example, it was found that the environmental impact of the manufacturing process and transportation is high. Although a modal shift to railway transportation seemed to be effective in reducing the environmental impact of transporting products, it was necessary to determine what kind of operational approach should be taken to achieve such effectiveness. Therefore, as a next step, we analyzed product transportation from Numazu Plant according to our economic accounting. From this analysis, we learned that a modal shift to railway transportation would reduce cost and environmental impact effectively when the distance of transportation is more than 200km.

Flow to Utilize Environmental Accounting



Internal Environmental Accounting Tool

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.

* For cases of segment environmental accounting.

See pages 19, 23, 33, 39 and 43.

Eco Balance Environmental Accounting

This is an internal environmental accounting tool to support PDCA for sustainable environmental management activities. The Ricoh Group conducts environmental accounting for each process and overall operations based on environmental impact data on each process, as obtained from "the Sustainable Environmental Management Information System."[1] Now, we are examining the applicability of the results of this Eco Balance Environmental Accounting to performance evaluation by division, as well as the utilization of these results in establishing and controlling the progress of "the Year 2010 Long-Term Environmental Goals"[2] and "the Environmental Action Plan."[3]

1. See page 49. 2. See page 9. 3. See page 11.

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 environmental accounting 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.

Review of Corporate Environmental Accounting in Fiscal 2004

Review of Corporate Environmental Accounting

The ratios of eco profit and eco effect, important indicators when measuring the effects sustainable environmental management activities have on cost, dropped about 10% in fiscal 2004 from the previous fiscal year's levels (see graph ①). This is because environmental conservation cost increased by approximately 7% compared to that in the previous fiscal year, and the economic benefits, particularly incidental effects of pollution prevention activities, decreased significantly. Incidental effects, however, lead to lower costs in implementing measures to avoid risks when the risks of pollution diminish due to the advancement of pollution prevention activities. On the other hand, if the ratios are compared to those at the start of the current environmental action plan (results in fiscal 2001), the ratio of eco profit increased by about 50% and ratio of eco effect about 3% (see graph ①).

The Eco Index, which indicates the level of sustainable environmental management for the entire business of the Ricoh Group, dropped slightly in fiscal 2004 from that in the previous fiscal year. This is because although total environmental impact decreased marginally, gross profit on sales declined 1.4% compared to the previous year's level. In terms of efficiency, however, in fiscal 2004 it improved approximately 45% compared to that in fiscal 2001, indicating that the level of sustainable environmental management for the entire business significantly rose over the past three years (see graph ②).

Corporate environmental accounting data (page 55) show that in environmental conservation costs, business area costs and administration costs remained unchanged in fiscal 2004 from those in the previous year. This implies that environmental management costs at business sites are stabilizing. Meanwhile, product recycling costs have increased over the past few years, surging in fiscal 2004.

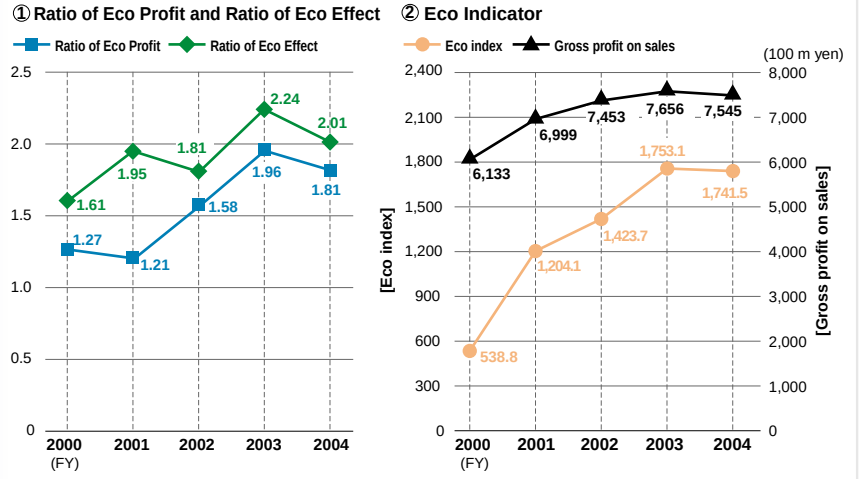
The cost of research and development in reducing environmental impact has expanded as well. These figures show that various costs are incurred in sustainable environmental management activities involving products.

Although it is becoming difficult to reap the economic benefits of environmental conservation activities carried out by business sites, the economic benefits of product recycling have substantially grown in the past few years. Consequently, the economic benefits of sustainable environmental management activities related to products now account for more than 50% of the total benefits, and this trend is likely to become more pronounced in the future.

However, when it comes to the effects of environmental conservation, the total amount of substances that have an impact on the environment have not decreased significantly, and this is true for all kinds of substances. CO_2 emissions, in particular, have increased by more than 2% due to production expansion and an extremely hot summer, which remains a challenging issue in the prevention of global warming in the future.

Currently, the Ricoh Group is promoting sustainable environmental management activities by improving the manufacturing process through innovations in energy/resource conservation. At Fukui Plant, for example, costs and the amount of materials and energy used were aggregated, and measures were taken to reduce loss and environmental impact by improving the production process. It was estimated that approximately ¥123 million in raw materials and direct expenses was cut per year thanks to these initiatives. We strive to further reduce the environmental impact of our business operations, thereby intensifying our efforts to promote sustainable environmental management.

Changes in Ricoh Group's Sustainable Environmental Management Indicators



Ricoh Group's Sustainable Environmental Management Indicators

Sustainable environmental management indicators	Results in fiscal 2004	Calculation formula
REP : Ratio of Eco Profit	1.81	Total economic benefit (29.98) /Total environmental conservation cost (16.57)
REE : Ratio of Eco Effect	2.01	{Total economic benefit (29.98) + Amount of reduction in social costs (0.03+3.29)}/Total environmental conservation cost (16.57)
Eco Index	1,741.5	Gross profit on sales (¥754,500,000 thousand) /Total environmental impact (433,247)
RPS : Ratio of Profit to Social cost	119.2	Gross profit on sales (754.5) /Total social cost (6.33)

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

Ricoh Group's Corporate Environmental Accounting in fiscal 2004

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 = ¥107.58 €1 = ¥135.25)

Item	Costs			Economic Benefits		
	Environmental Investments	Environmental Costs	Main Costs	Monetary Effects	Category	Item
Business area costs	5.3	20.9	Pollution prevention cost ····· ¥398 million Global environmental conservation cost ····· ¥598 million Resource circulation cost ····¥1,094 million	5.3	a	Energy savings and improved waste processing efficiency
				50.2	b	Contribution to value-added production
				59.4	c	Avoidance of risk in restoring environments and avoidance of lawsuits
Upstream/ Downstream costs	0.5	84.6	Cost of collecting, disassembling, and recycling used products	103.9	a	Sales of recycled products, etc.
				[26.5]	S	Reduction in society's waste disposal cost
Administration costs	1.1	33.8	Cost generated by the division in charge of environmental conservation; cost to establish and maintain an environmental management system	21.1	b	Effects of media coverage and environmental education
Research and development costs	1.0	18.9	Research and development costs for environmental impact reduction	51.5	a	Contribution to gross margin through environmental research and development
				[6.4]	S	Reduction in user's electricity expenses thanks to an improved energy saving function and product performance
Social activity costs	0.0	5.3	Costs of preparing environmental reports and advertisements	8.4	b	Publicity from environmental advertisements, etc.
Environmental remediation costs	0.6	1.6	Costs of restoring soil and environment-related reconciliation	0.0	—	None
Other costs	0.0	0.6	Other costs for environmental conservation	0.0		
Total	8.7	165.7		299.8	Sum of a:160.7, b:79.7, and c:59.4.	
				[32.9]	Total S's	

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

- **Environmental investment rate: 2.5%**
  [= environmental investment (8.7) /total capital investment (346.1)]
- **Environmental R&D cost rate: 1.7%**
  [= Total environmental R&D cost (18.9) /Total R&D cost (1,104)]

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 impacts. 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 conscious 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 impacts and to eliminate and remove such environmental impacts. The Ricoh Group reports the amount of reduction in the emission of substances with serious environmental impacts for the current year as compared with the previous year (emissions in the previous year – emissions in the current year).

This is the quantity of substances with environmental impacts that were emitted by the Ricoh Group in the current fiscal 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 Value of Impact
Converted quantity of reduction is obtained by multiplying environmental impact reduction by conversion coefficients and converted value 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.

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 Value of Impact	Social Costs
Environmental impact reduction at business sites							
CO_2 –6,766.5	1.0	–6,766	–0.99	CO_2 291,267	1.0	291,267	42.55
NO*x* 9.4	19.7	185	0.03	NO*x* 172	19.7	3,384	0.49
SO*x* –0.6	30.3	–18	–0.00	SO*x* 10	30.3	289	0.04
BOD 8.9	0.02	0.2	0.00	BOD 23	0.02	0	0.00
Final waste disposal amount 2.3	104.0	238	0.03	Final waste disposal amount 841	104.0	87,468	12.78
PRTR substance emissions (Ricoh standards per substance)		8,546	1.25	PRTR substance emissions (Ricoh standards per substance)		50,839	7.43
Environmental impact reduction through products CO_2 9,969.1 (t) NO*x* 8.2 (t) SO*x* 6.5 (t) Final waste disposal amount 33,096.0 (t) Calculation for companies in Japan only							
		2,185	0.31			433,247	63.28

Data coverage
- **Companies: 93 Ricoh Group companies.** See page 73.
- **Period: From April 1, 2004 to March 31, 2005 (for costs and total environmental impact).**

* Social cost is calculated using the factor of 108 Euro/t-CO_2 (14,607 yen/t-CO_2).

* Environmental impact reduction represents the difference between figures in fiscal 2003 and fiscal 2004.

(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 conscious 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