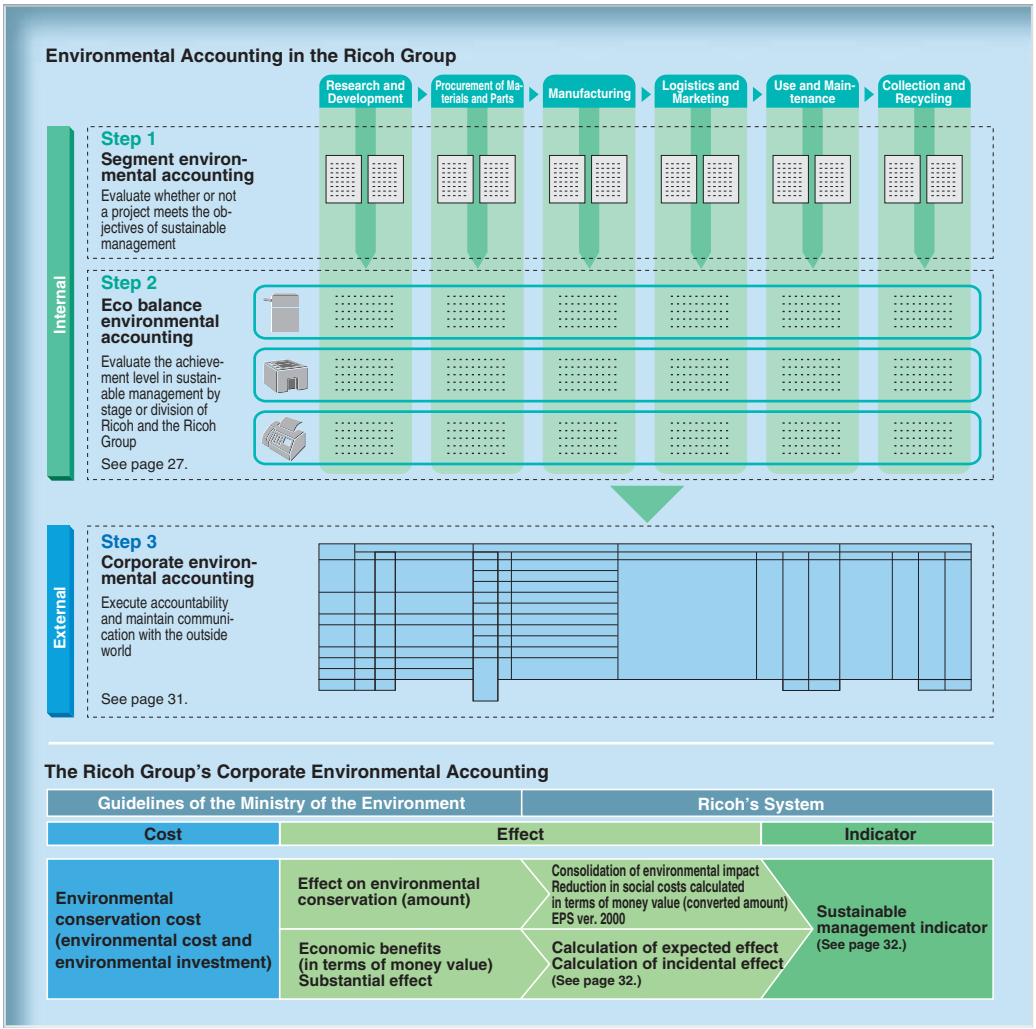
Environmental Accounting

Aiming to establish an environmental accounting system to support managerial decision making and evaluate sustainable management

Thanks to its environmental accounting system, which was disclosed for the first time in 1999, the Ricoh Group has built up a good reputation. Nevertheless, there are still many problems to be solved using this as a managerial decision-making tool. We will internally utilize segment environmental accounting and the Eco Balance environmental accounting system to improve our sustainable management and the accuracy of corporate environmental accounting based on consistent standards.



Segment Environmental Accounting (Step 1)

Segment environmental accounting is the easiest to introduce and can be promptly applied at each site: a process or project is selected, and its environmental cost and effect are calculated based on the concept of return on investment (ROI). The calculation result is internally used in making decisions in sustainable management. Ricoh Group companies and divisions utilize environmental accounting in their businesses, including segment environmental accounting for their recycling business*.

* See page 58. For segment environmental accounting, see also pages 17, 47, 50, 52, and 53.

Eco Balance Environmental Accounting (Step 2)

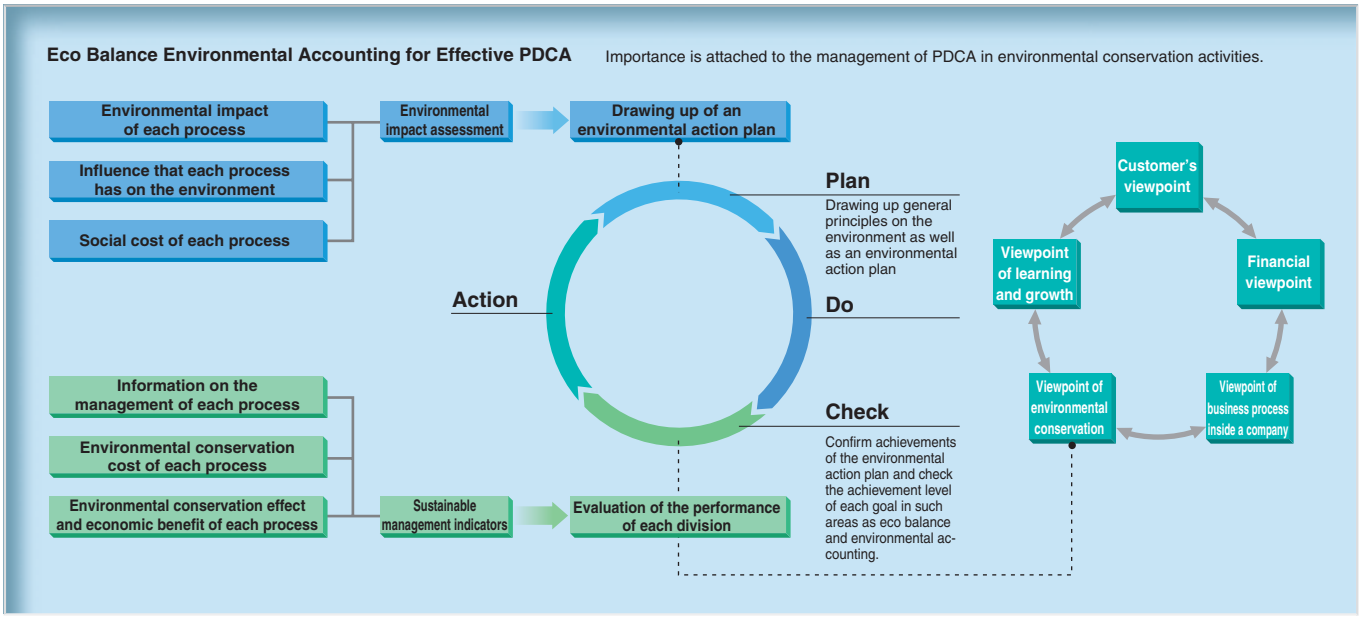
Eco Balance environmental accounting[1] is internally used to control and promote the PDCA cycle for environmental conservation activities. It can be used first to control processes that have higher environmental impact, such as the manufacturing process, and then gradually expanded to include control over all business processes. The Ricoh Group carries out environmental accounting for each process and the Ricoh Group as a whole based on the environmental impact information for each process obtained from the environmental management information system[2]. The results are then used in making environmental action plans and evaluating divisional business performance.

1. See page 27.
2. See page 25.

Corporate Environmental Accounting (Step 3)

Corporate environmental accounting is used as a tool to inform the public of relevant information, in line with guidelines set forth by Japan's Ministry of the Environment. The Ricoh Group takes the necessary information from the Eco Balance environmental accounting data and calculates the cost and effect (in quantities and monetary values) of its environmental conservation activities based on its own formulas and indicators[1]. The calculated results are disclosed to the public after being verified by a third-party organization[2]. We will continue to improve the accuracy of the information to be disclosed and will aggressively standardize the information to make it comparable to already standardized documents, such as balance sheets.

1. See page 32 for formulas and indicators.
2. For fiscal 2002 corporate environmental accounting, see page 31.



Profit Contribution Rate of Eco-Friendly Products

To carry out sustainable management that reduces environmental impact and increases corporate profits, it is essential to develop products that have less environmental impact and encourage more consumers to use them. To calculate the effects of such products in environmental accounting in an accurate manner, an indicator is required. The Ricoh Group uses eco-friendly points* for its indicator. Eco-friendly points are given to products according to their eco-friendliness, and based on the points given the profit contribution rates of products developed with environmental technologies are calculated. In fiscal 2002, we conducted a survey targeting customers who purchased copiers manufactured by Ricoh to identify the contribution of eco-friendliness to the corporate profit. The profit contribution made through R&D activities, which is shown on the next page, was calculated based on the result of this survey.

* The environmental impact of a product is compared with that of the previous model, and the impact reduction rate is calculated based on LCA.

● Results of a Survey on the Profit Contribution Rate of Eco-Friendly Copiers

According to a survey given to our customers concerning the criteria they use when choosing a copier, 19.8% listed eco-friendliness, an average of 35.9% of which stated that the degree of eco-friendliness was an important factor. Multiplying these numbers (19.8% × 35.9%), the profit contribution rate of eco-friendly products comes to 7.11%.

● Improved Accuracy of the Profit Contribution Rate

By dividing the profit contribution rate by the eco-friendly point (based on the environmental impact reduction rate of a product), the average profit contribution rate per eco-friendly point is 0.29%. This figure seems to be appropriate based on the result of a conjoint analysis made in the past (0.32%) and the result of a customer satisfaction level survey (0.26%). The accuracy of the profit contribution rate was improved, and from fiscal 2003 the R&D profit contribution rate will be indicated as a practical effect of R&D activities.

Customer's Reasons for Selecting a Model and Profit Contribution Rate

Model	Reasons for Selection		Profit Contribution Rate
	Percentage of customers whose reasons for selection included environmental consciousness	Percentage of environmental consciousness in customer's reasons for selection	
Copier A (Black and white)	17.9%	34.8%	6.23%
Copier B (Black and white)	24.6%	37.9%	9.32%
Copier C (Color)	15.4%	34.6%	5.33%
Average	19.8%	35.9%	7.11%

Relationship between Profit Contribution Rate and Eco-friendly Points (in limited models)

Model	Eco-friendly Points	Profit Contribution Rate	Contribution Rate per Point
Copier A (Black and white)	26	6.23%	0.24%
Copier B (Black and white)	25	9.32%	0.37%
Copier C (Color)	22	5.33%	0.24%
Total	73	20.88%	0.29% (Average)

* From the above survey results, the contribution rate for each eco-friendly point in fiscal 2002 was set at 0.29.

Fiscal 2002 Ricoh Group Corporate Environmental Accounting Reviewed by BVQI (5)

Cost unit: ¥100 million (Exchange rate: $1 = ¥121.96 €1 = ¥121.00)

Item	Costs			Economic Benefits			
	Environmental Investments	Environmental Costs	Main Costs	Monetary Effects	Category	Item	
Business area costs	3.5	25.6	Pollution prevention cost ····· ¥740 million Global environmental conservation cost ····· ¥336 million Resource circulation cost ····¥1,484 million	10.9	a	Energy savings and improved waste processing efficiency	
				50.9	b	Contribution to value-added production	
				69.4	c	Avoidance of risk in restoring environments and avoidance of lawsuits	
Upstream/ Downstream costs	0.5	65.3	Cost of collecting, disassembling, and recycling used products	58.9	a	Sales of recycled products, etc.	
				[21.1]	S	Reduction in society's waste disposal cost	
Managerial activity costs	0.4	39.8	Cost generated by the division in charge of environmental conservation; cost to establish and maintain an environmental management system	3.6	b	Effects of media coverage and environmental education	
Research and development costs	0.9	15.9	Research and development costs for environmental impact reduction	36.1	a	Contribution to gross margin through environmental research and development	
				[5.6]	S	Reduction in user's electricity expenses thanks to an improved energy saving function and product performance	
Social activity costs	0.0	2.8	Costs of preparing environmental reports and advertisements	8.2	b	Publicity from environmental advertisements, etc.	
Environmental damage costs	0.9	0.9	Costs of restoring soil and environment-related reconciliation	—	—	None	
Other costs	0.0	0.3	Other costs for environmental conservation				
Total	6.2	150.6		238.0	Sum of a:105.9, b:62.7, and c:69.4.	a: Substantial effect b: Expected effect c: Incidental effect S: Social effect (Customer benefits)	
				[26.7]	Total S's		

- **Environmental investment rate: 2.2%**
  [= environmental investment (6.2)/total capital investment (281.9)]
- **Environmental R&D cost rate: 1.9%**
  [= Total environmental R&D cost (15.9)/Total R&D cost (835)]

■ Fiscal 2002 Environmental Accounting

The environmental conservation cost of the Ricoh Group as a whole increased approximately 17% compared with that in the previous fiscal year due to increases in the recycling-related cost and environmental management system maintenance cost. As for the economic effects of each cost item, the upstream/downstream cost, representing product recycling-related costs, increased 34% year on year, but profit from the sales of recycled products increased roughly 76%, which shows that the recycling business has steadily improved, moving towards the breakeven point. Regarding environmental conservation effects, environmental impact was not reduced much in fiscal 2002 compared with that in the past. However, considering the fact that total environmental impact (expressed in terms of greenhouse gas emissions) was reduced by half compared with that in fiscal 2000, the reduction in fiscal 2002 does not appear too unreasonable. Sustainable management indicators showed satisfactory results. For example, the eco-index increased about 18% compared to the last fiscal year, to 1,423.7, which is 2.6 times that in fiscal 2002. Also in fiscal 2003, the indicator is expected to increase as much as approximately 6%.

The Ricoh Group promotes the establishment of Eco Balance environmental accounting,* and it is now possible to calculate sustainable management indicators based on the environmental impact caused by and the cost of environmental measures taken for the domestic image-related product business. We will also examine the introduction of sustainable management indicators based on the evaluation of each product's environmental cost and benefit. Such indicators will be used as numerical targets for each product in the environmental action plan.

* See page 27.

Change in gross profit and sustainable management indicators in the Ricoh Group

	Fiscal 2000	Fiscal 2001	Fiscal 2002
Ratio of eco profit	1.27	1.21	1.58
Ratio of eco effect	1.61	1.95	1.81
Eco index	538.8	1,204.1	1,423.7
Ratio of profit to social cost	40.9	100.8	108.9
Gross profit (100 millions of yen)	6,133	6,999	7,453

Collected data
- **Source: 89 Ricoh Group companies (See page 2.)**
- **Collection period: From April 1, 2002, to March 31, 2003 (for cost and total environmental impact)**

* Environmental impact reduction shows the difference of the fiscal 2002 performance from the fiscal 2001 performance.
* Social cost is calculated based on 108 Euro/t - CO_2 (¥13,068/t - CO_2).

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 Reduction	Social Costs
Environmental impact reduction at business sites							
CO_2 ..... -3,054.4	1.0	-3,054	-0.40	CO_2 286,198	1.0	286,198	37.40
NO_x 1.5	19.7	29	0.00	NO_x 189	19.7	3,716	0.49
SO_x 9.5	30.3	289	0.04	SO_x 14	30.3	422	0.06
BOD 33.2	0.02	1	0.00	BOD 22	0.02	0	0.00
Final waste disposal amount 148.9	104.0	15,483	2.02	Final waste disposal amount 1,490	104.0	154,955	20.25
PRTR substance emissions	(Ricoh standards per substance)	47,025	6.15	PRTR substance emissions	(Ricoh standards per substance)	78,211	10.22
Environmental impact reduction through products CO_2 ..... 8,709.3 (t) NO_x ..... 7.1 (t) SO_x ..... 5.7 (t) Final waste disposal amount ... 26,422.0 (t) Calculation for companies in Japan only							
		59,773	7.81			523,502	68.42

Sustainable Management Indicator	Results for Fiscal 2002	Formula
Ratio of eco profit (REP)	1.58	Total economic benefit (238.0)/Total environmental conservation cost (150.6)
Ratio of eco effect (REE)	1.81	[Total economic benefit (238.0) + Total social cost reduction amount (7.81 + 26.7)]/Total environmental conservation cost (150.6)
Eco index	1,423.7	Gross profit (¥745,349,000 thousand/Total environmental amount (523,502)
Ratio of profit to social cost (RPS)	108.9	Gross profit (¥745.3 billion)/Total social cost (¥6.84 billion)

(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 eco-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 environmental report

(3) Formula of Incidental Effects

Amount of incidental effect	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