How are Environmental Accounting and Environmental Management Indicator Used?

JR East utilizes environmental accounting to understand the cost effectiveness of our expenditures and investments for environmental conservation. The results, together with our own environmental management indicator, are used to assist management decision-making.

Environmental Accounting for FY 2003

(billion yen)

Categorization of environmental conservation activities	Environmental conservation costs (billion yen)		Effects of environmental conservation attained through environmental goals			Economic benefits accompanying environmental conservation activities
	Investment	Expenses		FY 2002	FY 2003	
Environmental conservation along railway lines (Anti-pollution activities)	6.62	6.68	Reduction of noise to 75dB or less in designated residential areas along the *Tohoku* and *Joetsu Shinkansen* Lines NOx emissions at the Kawasaki Thermal Plant	100%-achievement 399t	**100%-achievement** **341t**	–
Global environment conservation	59.68	–	Total CO_2 emissions from general business activities CO_2 emissions in proportion to unit electric power generation at the Kawasaki Thermal Plant Ratio of energy-saving railcars Energy consumption for train operations in proportion to unit transportation volume Number of large freezer units using specific chlorofluorocarbons (CFCs)	2.32 million tons-CO_2 519g-CO_2/kwh 68% 18.6 MJ/car-km 19 units	**2.2 million tons-CO_2** **504g-CO_2/kwh** **72%** **18.3 MJ/car-km** **14 units**	21.36
Resource-recycling	–	4.86	Recycling rate of waste from stations/trains Recycling rate of waste at rolling stock workshops Recycling rate of waste from construction projects Rate of recycled paper used for office stock	37% 74% 84% 98%	**39%** **81%** **92%** **99%**	3.95
Environmental management	0.03	0.45	Forestation along railway lines	13 locations 10,000 trees planted 3,500 participants	**15 locations** **12,000 trees planted** **2,400 participants**	–
Research and development of environment-related technologies	–	1.30				–
Social activities	–	0.04				–
Total	66.33	13.33				25.31

Reference
Investment in facilities for the period: 235.5 billion yen
Total expenditures for research and development for the period: 15.7 billion yen[*1]

*1 **Total R&D costs**
Covers research and development in basic fields, including funding of the Railway General Research Institute (5.9 billion yen) in accord with the Agreement on Research Activities.

Environmental Accounting

Summarized results for FY 2003

In FY 2003, the cost of environmental conservation activities in the form of investment reached 66.3 billion yen while that of expenditures were 13.3 billion yen.

Global conservation activities, which account for a major part of the investments, were 59.6 billion yen, 14.4 billion yen less than the previous fiscal year when implementation of energy-saving railcars was accelerated in response to the extension of the *Tohoku Shinkansen* to Hachinohe. The introduction of energy-saving railcars and other facilities have reduced CO_2 emissions by 430,000 tons-CO_2.

Investment in environmental conservation along railway lines increased by 1.6 billion yen, raising the total expenditures to 6.6 billion yen, mainly due to the increase in investment for measures to reduce *Shinkansen* noise.

Verification through an environmental management indicator

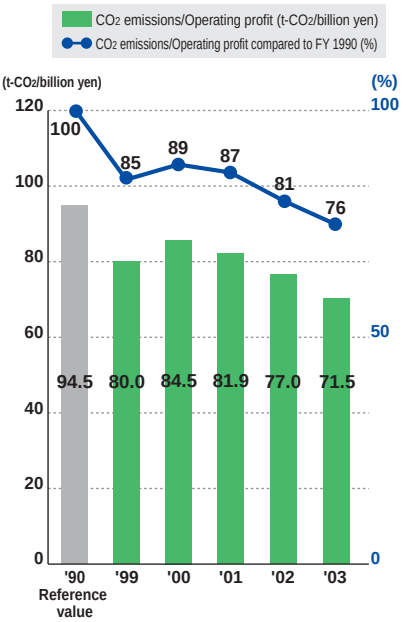
JR East established an environmental management indicator used to determine the relationship between our business activities and environmental impact. The indicator is refered to as "Added Economic Value" based on operating profits with having CO_2 emissions, one of our top priorities, as our environmental impact factor. We utilize this indicator to guide our business planning and decision-making for management.

In this equation, a smaller value indicates that the business is earning added economic value with fewer burdens on the environment. Due to our efforts over the last decade, the value of 94.5 (t-CO_2/billion yen) recorded in FY 1990 improved to 71.5 (t-CO_2/billion yen) in FY 2003.

Environmental management indicator

$$= \frac{\text{Environmental impact}}{\text{Added economic value}} = \frac{\text{CO}_2\text{ emissions (t-CO}_2\text{)}}{\text{Operating profit (billion yen)}}$$

Changes in environmental management indicator



Calculation of environmental conservation costs

Environmental conservation costs

- ○ Data refers to East Japan Railway Company only (on a non-consolidated basis).
- ○ Based on "Environmental Accounting Guidelines" (FY 2002 edition) by the Ministry of Environment.
- ○ "Environmental conservation costs" cover only those that are identifiable by the current management system.
- ○ Among the multipurpose expenditures, the total cost is reported for those with significant environmental benefits; (The cost for pollution prevention includes all expenses incurred in installing continuous welded rails, etc., as this is considered to contribute to enhanced functionality. The cost for global environmental conservation includes the total amount invested in energy-saving railcars.)
- ○ Expenses do not include depreciation
- ○ Expenses for processing refuse generated at stations and on trains (under resource-recycling costs) are calculated as follows: A model is set up for cleaning stations and trains. Then the percentage taken up by waste recycling and processing is calculated (in proportion to the entire model). By multiplying the overall cleaning expenses for stations and trains by this percentage, the amount of expenditure is obtained.
- ○ Of the resource-recycling costs, the cost of processing waste from construction projects and rolling stock workshops is calculated for each facility by multiplying the waste volume in FY 2003 by a standard per unit cost.

Benefits of environmental conservation

- ○ The benefit of environmental conservation is calculated based on figures that represent environmental targets.

Economic benefits of environmental conservation activities

- ○ As for global conservation, the economic benefit is calculated by determining the annual reduction of electricity and maintenance costs generated by the introduction of energy-saving railcars, cogeneration, etc. (including partial estimates), then multiplying this amount by the legally accepted depreciation lifespan.
- ○ Cost of processing waste generated by construction work and rolling stock workshops incorporates revenue generated from the resale of reusable resources.