

## 2. The Environmental Accounting System and its Utilization

Kyushu Electric Power proceeds with systematic improvement of environmental accounting to promote efficient and effective environmental activities and understanding from society.

### (1) Environmental accounting system

#### Fiscal 2001 environmental accounting

##### System's basic guidelines

The system is based on the "Fiscal 2002 Guidelines for Environmental Accounting" (March 2002 by the Ministry of the Environment). However, environmental activities are divided into small categories so that the content may be easily understood.

##### Accounting period

April 1, 2001 to March 31, 2002 (same as the business year)

##### Scope of accounting application

Kyushu Electric Power Co., Inc. (application to the Kyushu Electric Power Group companies is under consideration, therefore currently not included)

##### Scope of activities for the accounting application

The prevention, control, removal or reparation of any action that significantly hampers the environment caused by business or non-business activities and of problems that might hinder efforts to support the environment.

(Supplemental definition)

The above activities exclude those related to safety and sanitation (e.g. measures against particulates at workplaces) within the company and other environmental activities that are deemed to be social conventions (e.g. low-noise transformers and electric motors).

##### Environmental activity costs

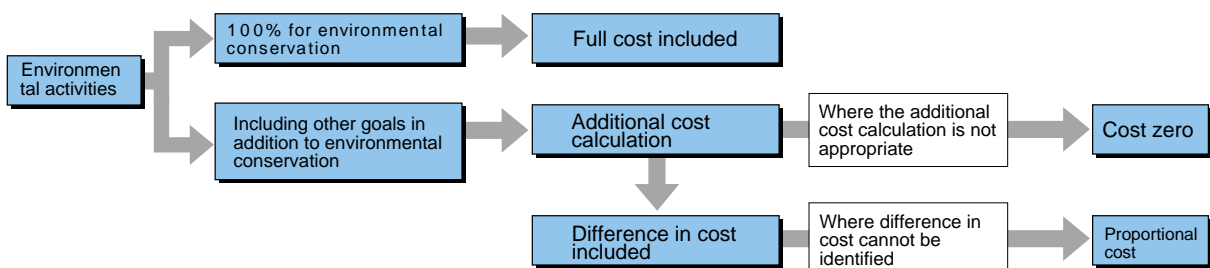
Investment and expenses in environmental activity costs are defined as follows:

**Investments:** expenditures for the fiscal year for items capitalized as assets such as investment in plant and equipment, and other financing for the purpose of environmental conservation

**Expenses:** expenditure for the purpose of environmental conservation, e.g. depreciation expenses, lease expenses, repair expenses, maintenance and management expenses, commissioning expenses and personnel expenses

( N.B. Depreciation expenses are applicable for items equivalent to environmental activity facilities, and are calculated and added according to the service life and depreciation method of the financial and accounting practices. )

The full costs and differences in cost are used in the cost calculation as a principle; however, proportional costs are used where the differences in cost are difficult to identify.



### Benefits of environmental activities

Benefits from environmental activities are calculated based on the amount of substances, and are defined according to the types of activities as follows:

Activities that directly reduce the environmental load

Amount of environmental load reduction from the baseline\* (the conditions which would have occurred had there been no environmental targets)

\*Baselines are set for their respective environmental activities. For example, the baseline for CO<sub>2</sub> reduction calculations is a situation where the electricity generated by all power generation methods was produced only by oil and coal-fired thermal generation; and that for SO<sub>x</sub> reduction calculation is a situation where no desulfurization facility is installed.

However, for items of which calculation of the environmental load reduction is difficult, the amount of influence on the environmental load reduction is posted.

Activities for the removal, mitigation or reparation of the impact of the environmental load

Amount of environmental load to which impact removal and other activities are implemented

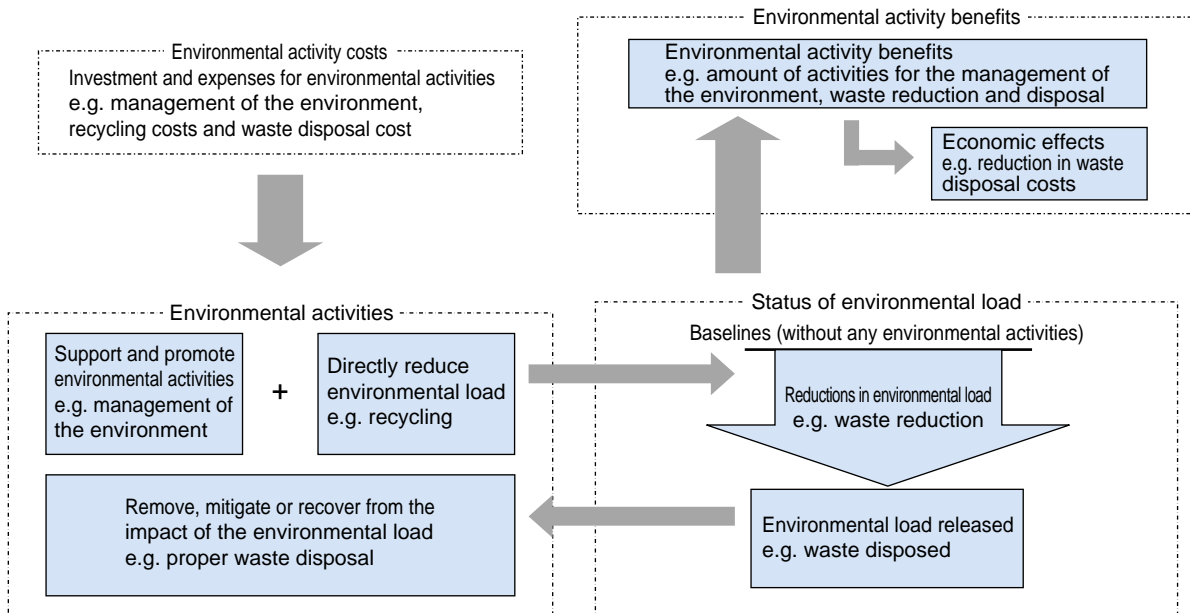
Activities that support and promote environmental load reduction (two items above)

Amount of activities that are required for support and promotion

### Economic effects of environmental activities

Items in the economic effects include the cost reductions, savings and sales of unneeded supplies (i.e. real effects only) attendant on the reduction of environmental load that incurs costs whenever used or treated. However, estimated effects such as costs avoided from the reparation of environmental damages are not included.

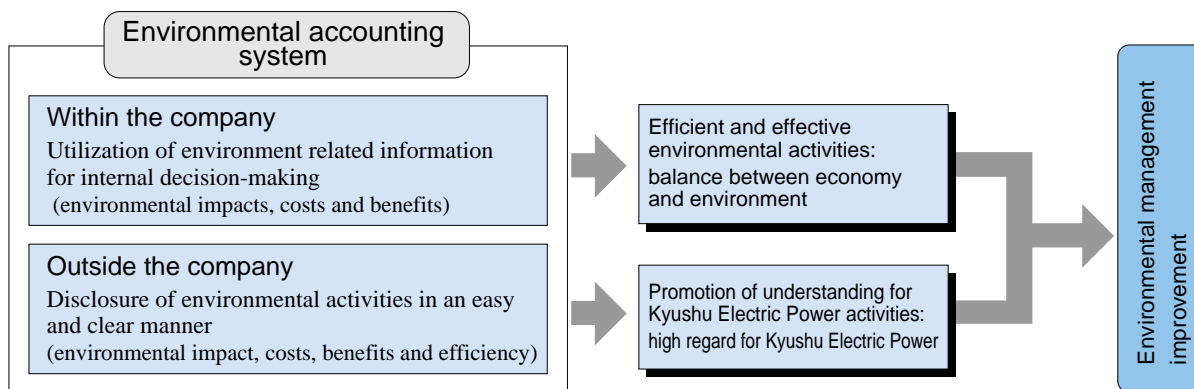
Environmental activity costs and benefits



## For improvement of environmental accounting

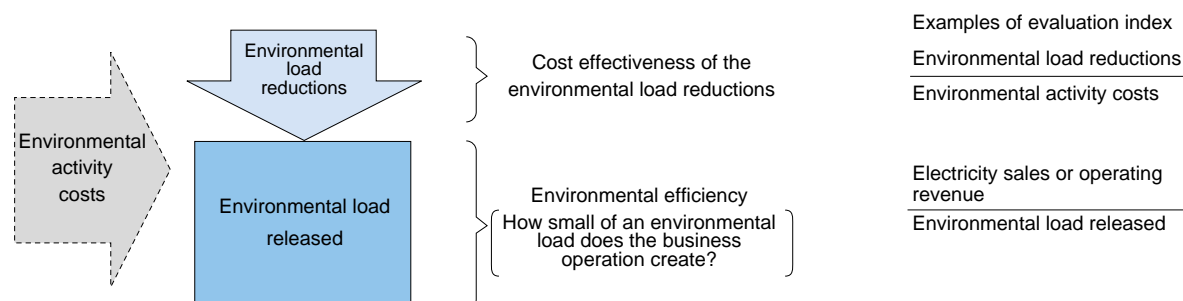
### Systematic improvement of the environmental accounting system

Kyushu Electric Power is proceeding with the systematic improvement of its environmental accounting system in order to bring up its level of environmental management.



### Establishment of an index for the management of the environment

The management index is currently undergoing examination. This enables costs and environmental load reductions calculated in environmental accounting to be used in the management of the environment.



As a part of this measure, the items below were calculated as a test:

Integration of environmental load categories

Comparison of cost effectiveness (reduction efficiency) of each activity by using integrated environmental load categories

Change in company-wide environmental efficiency

Kyushu Electric Power plans to examine all of the items above, and to further utilize environmental accounting throughout the company and at each office.

### Integration of environmental load categories and reduction efficiency

Environmental load is expressed as the amount of CO<sub>2</sub>, SO<sub>x</sub>, NO<sub>x</sub>, particulates and waste, and is calculated in different units. To carry out environmental activities effectively, environmental load categories must be integrated by taking into account the level of impact on the environment so that a comparison may be made.

The method of integration is currently under research both domestically and internationally. The trial calculation shown here used the integration coefficient of the ELP method, which was developed by the Nagata Laboratory of Waseda University. The reduction efficiency of the activities that directly reduce the environmental load was calculated based on the results.

N.B. ELP method: ( ELP is a unit of integrated environmental load used to estimate the environmental efficiency index of environmental accounting. In the ELP method, substances, such as CO<sub>2</sub>, SO<sub>x</sub>, NO<sub>x</sub> are classified according to the weight of their environmental impact level in order to integrate environmental load. Research is being conducted regarding environmental load integration as a quantification method for the LCA (Life Cycle Assessment) of products. For more information about the concept and the integration coefficient, access <http://www.nagata.mech.waseda.ac.jp/study/lca1/index-j.html>.)

Environmental activity categories		Environmental activity costs (a)	Environmental activity benefits		Integrated*1		Reduction efficiency (a ÷ b)*2		
			Items	Benefits (b)	Index	enefits (b)	Integrated environmental load categories	Each environmental load	
Global environment conservation	Global warming prevention	4.43 billion yen	CO <sub>2</sub> reduction	Power source	47,400,000 tons-CO <sub>2</sub> /yr	1	47,400,000	92	92 yen/tons-CO <sub>2</sub>
				Energy saving	15 tons-CO <sub>2</sub> /yr		15		
				SF <sub>6</sub> emission reduction	562,965 tons-CO <sub>2</sub> /yr		562,965		
Pollution prevention	Air pollution prevention	8.72 billion yen		SO <sub>x</sub> reduction	51,177 tons	1,417	72,517,809	38	28,579 yen/tons
				NO <sub>x</sub> reduction	14,431 tons	1,360	19,626,160		
				Particulate reduction	239,583 tons	574	137,520,642		
	Water pollution prevention	2.83 billion yen		Environmental load reduced in waste water	538 tons	1,138	612,244	4,626	5,263,838 yen/tons
Resource recycling	Industrial waste	2.52 billion yen		Reduction in disposal + amount recycled	459,500 tons	6	2,757,000	916	5,493 yen/ tons
	General waste	130 million yen		Used paper recycled	895 tons		5,370	24,658	147,946 yen/ tons
Total		18.64 billion yen		-	-	-	281,002,205	66	-

\*1: The index for the integration used was obtained by converting the ELP method index so that the CO<sub>2</sub> index equals one.

\*2: The denominator of the reduction efficiency (b) is the integrated effect for the integrated environmental load categories, and the respective effect (of CO<sub>2</sub>waste, etc.) for each environmental load.

The trial calculation above yields the following assumptions:

Among reduction efficiencies for each environmental load, global warming prevention (CO<sub>2</sub> reduction) is most inexpensive (efficient); and with respect to integrated environmental load categories that take into account the level of environmental impact, air pollution prevention is implemented with the best efficiency.

Among the activities for global warming prevention, the installation of power sources with low CO<sub>2</sub> emissions such as nuclear power stations is implemented to simultaneously achieve economic efficiency, energy security and environmental preservation (optimal combination of energy sources). Therefore, despite a great contribution to CO<sub>2</sub> reduction, no cost is included for it since calculation of the additional cost for the purpose of environmental preservation is not appropriate. For the same reason, even though reduction efficiency as an integrated item is inexpensive, reduction efficiency for each measure is expensive, as evidenced by the approximate 13,300 yen/ton-CO<sub>2</sub> cost for the introduction and support of new energy, and approximately 300yen/ton -CO<sub>2</sub> for SF<sub>6</sub> emissions reductions.

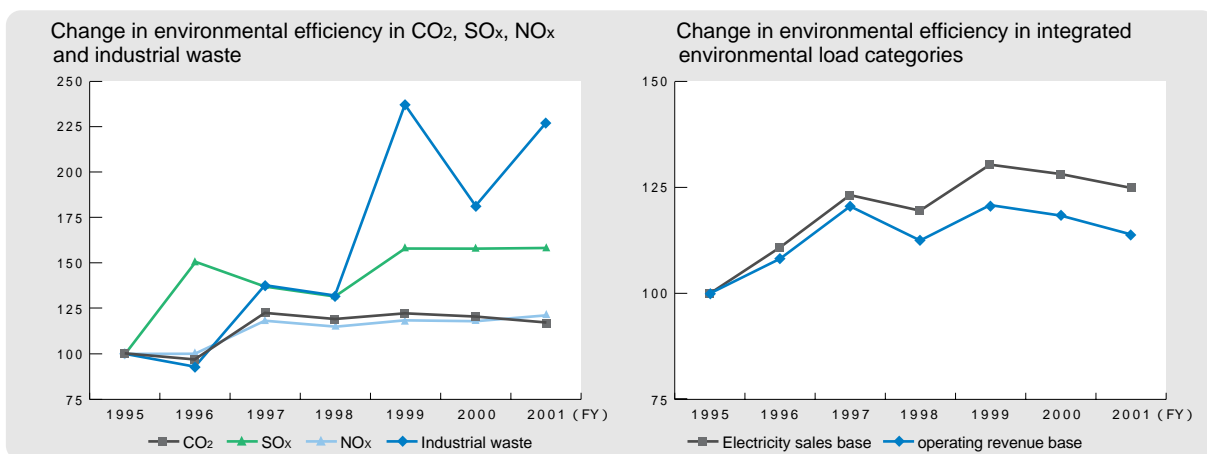
Although the recycling of a large quantity of industrial waste, such as coal ash, may require a large share of the costs, it boasts 27 times higher reduction efficiency (being efficient) than general waste.

### Changes in company-wide environmental efficiency

As stated in the “Fiscal 2002 White Paper on Environment” by the Ministry of the Environment, the improvement of environmental efficiency is essential in creating a society with sustainable development.

‘Environmental efficiency’ is defined as the amount of economic activities (GDP is used in the White Paper) per amount of energy consumption and environmental load.

Here, four environmental loads (CO<sub>2</sub>, SO<sub>x</sub>, NO<sub>x</sub> and industrial waste) and their integrated environmental load categories are calculated as a test to recognize present conditions with the purpose of achieving sustainable development. In calculating environmental efficiency, the electricity sales that are the foundation of the company's business activities are used as the base for each environmental load, and electricity sales and operating revenue are used for the integrated environmental load categories.



N.B. Environmental efficiency = Kyushu Electric Power's electricity sales (or operating revenue)÷ each environmental load  
However, all data are based on fiscal 1995 as a baseline of 100.