

# **Environmental Accounting Guidelines 2005**

**February 2005**

**Ministry of the Environment**

**JAPAN**

# Contents

Introduction.....	1
1. What is Environmental Accounting?.....	3
1.1 Definition .....	3
1.2 Functions and Roles of Environmental Accounting.....	4
1.3 Basic Dimensions of Environmental Accounting .....	6
1.4 Structural Elements of Environmental Accounting .....	9
2. Basic Environmental Accounting Elements .....	11
2.1 Key Items Forming Bases of Environmental Accounting.....	11
2.2 Target Period and Scope of Calculations.....	11
3. Environmental Conservation Cost .....	13
3.1 Scope of Environmental Conservation Cost .....	13
3.2 Environmental Conservation Cost Categories.....	14
3.3 Method for Aggregating Environmental Conservation Cost .....	23
4. Environmental Conservation Benefit .....	25
4.1 Categories of Environmental Conservation Benefit .....	25
4.2 Method for Measuring Environmental Conservation Benefit.....	30
4.3 Identification of Environmental Conservation Benefit Based upon Environmental Conservation Cost Categories.....	31
5. Economic Benefit Associated with Environmental Conservation Activities.....	32
5.1 Economic Benefits Associated with Environmental Conservation Activities.....	32
5.2 Method for Measuring Economic Benefit Associated with Environmental Conservation Activities .....	34
5.3 Method for Evaluating Economic Value of Environmental Conservation Benefit .....	35
6. Treatment of Consolidated Environmental Accounting .....	37
6.1 Scope of Consolidation.....	37
6.2 Consolidated Environmental Accounting Aggregation .....	38
7. Disclosure of Environmental Accounting Information .....	39
7.1 Processes and Results of Environmental Conservation Activities .....	39
7.2 Key Items Forming Bases of Environmental Accounting.....	40
7.3 Aggregated Results of Environmental Accounting.....	43
8. Application in Internal Management.....	44
8.1 Relationship between Disclosed Information and Internal Management Information ...	44
8.2 Development of Tools Focusing on Internal Management.....	46
9. Indicators for Analysis Using Environmental Accounting Data.....	47
9.1 Meaning and Role of Indicators for Analysis.....	47
9.2 Concept and Content of Indicators for Analysis.....	47

10. Environmental Accounting Disclosure Format and Internal Management Tables ..... 49

    10.1 Disclosure Format for External Publication ..... 49

    10.2 Management Tables for Internal Use..... 56

    10.3 Various Reference Tables for Application in Environmental Accounting ..... 63

# **Introduction**

## **(1) Objectives of Environmental Accounting Guidelines**

The disclosure of environmental accounting regarding environmental conservation activities of companies and other organizations, including public interest organizations and local public entities, provides a means for stakeholders to understand, evaluate, and give their support to such efforts. Environmental accounting continues to take root as part of the social system.

The Guidelines have been revised taking into account developments in environmental accounting at companies and other organizations, with the objective of supporting the introduction and implementation of environmental accounting at companies and other organizations. As much attention as possible is given to items to be taken into consideration in the disclosure of information, so that the environmental accounting data composed and published in accordance with the Guidelines has the highest degree of comparability possible. The Guidelines are also intended to insure that the information disclosed takes into consideration the needs of the various stakeholders.

The Guidelines also provide the concepts behind gaining a more detailed ascertainment where necessary of more precise information content, with consideration given to the usefulness of the application of these concepts within the companies and other organizations as well. The objective is to improve the effectiveness of environmental accounting methodology, so that by employing the Guidelines in organizing environmental accounting data, companies and other organizations can monitor their data not only for publication, but also further their objective of internal environmental management.

## **(2) Environmental Accounting Background**

The number of companies and other organizations solidifying their environmental approach and developing business activities that take the environment into consideration and encompass environmental conservation efforts continues to increase. Efforts made in environmental accounting comprise a part of these environmentally-conscious business activities.

Environmental accounting data is not only used by companies or other organizations internally, but is also made public through disclosure in environmental reports.

The disclosure of environmental accounting data as one of the key elements in an environmental report enables those parties utilizing this information to get an understanding of the company's stance on environmental conservation and how it specifically deals with environmental issues. At the same time, a more comprehensive grasp of the companies and other organizations' environmental information can be obtained.

## **(3) Necessity of Environmental Accounting**

The quantitative management of environmental conservation activities is an effective way of achieving and maintaining sound business management. In other words, in carrying out environmental conservation activities, a company or other organizations can accurately identify and measure investments and costs related to environmental conservation activities, and can prepare and analyze this data. By having better insight into the potential benefit of these investments and costs, the company can not only improve the efficiency of its activities, but environmental accounting also plays a very important role in supporting rational decision-making.

In addition, companies and other organizations are required to have accountability to stakeholders, such as consumers, business partners, investors, employees, local residents, and administration, when utilizing

environmental resources, i.e. public goods, for their business activities. Disclosure of environmental accounting information is a key process in performing accountability. Consequently, environmental accounting helps companies and other organizations boost their public trust and confidence and are associated with receiving a fair assessment.

# 1. What is Environmental Accounting?

## 1.1 Definition

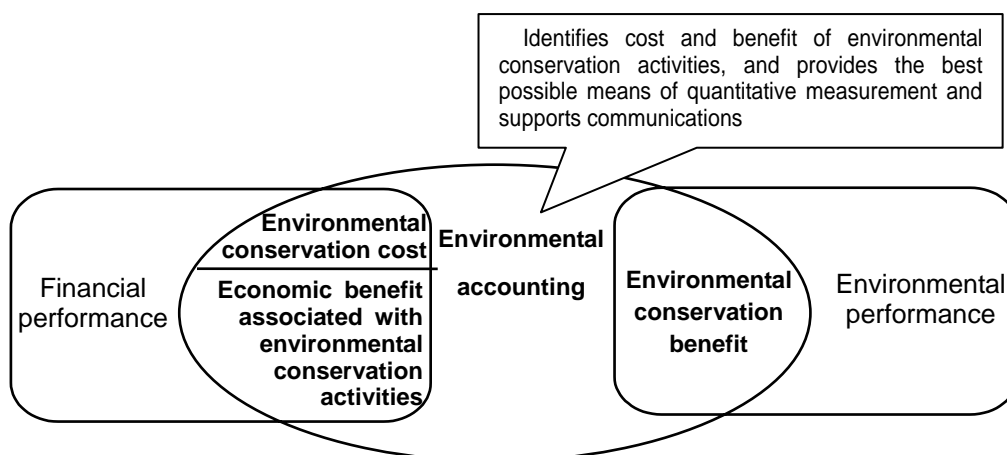
Environmental accounting, as defined in these guidelines, aims at achieving sustainable development, maintaining a favorable relationship with the community, and pursuing effective and efficient environmental conservation activities. These accounting procedures allow a company to identify the cost of environmental conservation during the normal course of business, identify benefit gained from such activities, provide the best possible means of quantitative measurement (in monetary value or physical units) and support the communication of its results. [Explanation 01] [Explanation 02]

Herein, environmental conservation is defined as the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities. The environmental impacts are the burden on the environment from business operations or other human activities and potential obstacles which may hinder the preservation of a favorable environment.

### [Explanation 01] Conceptual Framework of Environmental Accounting in the Guidelines

The environmental accounting focuses on two areas: national/regional environmental accounting, and environmental accounting for companies and other organizations. These Guidelines cover environmental accounting for companies and other organizations.

The environmental accounting covered in the Guidelines is composed of the following factors: environmental conservation cost (monetary value), environmental conservation benefit (physical units), and the economic benefit of environmental conservation activities (monetary value). The data for each of these components is represented in figures or descriptive information. In other words, it is a structure for systematically identifying, measuring, and communicating environmental conservation cost and the economic benefit of environmental conservation measures; this is the financial performance portion of environmental accounting, representing the activities of companies and other organizations in monetary value. The environmental accounting system also identifies, measures, and communicates the environmental conservation benefit, which is the environmental performance portion represented in physical units. The results of environmental accounting can be furthermore used for analysis and evaluation.



### **[Explanation 02] Nature of Environmental Accounting Data**

While the system outlined in the Guidelines provides for quantitative assessment of environmental conservation activities through environmental accounting, qualitative information supporting quantitative data must be included in addition to data in the form of monetary and physical units.

The table below lists the quantitative and qualitative information for each component factor.

Component factor	Quantitative data	Qualitative information
Environmental conservation cost	Monetary value	Cost details
Environmental conservation benefit	Physical unit	Benefit details
Economic benefit associated with environmental conservation activities	Monetary value	Benefit details

In addition, the major categories forming the bases of environmental accounting and explanations of the aggregated results are classified as qualitative information.

## **1.2 Functions and Roles of Environmental Accounting**

The functions of environmental accounting are divided into internal and external functions.

### **(1) Internal Functions**

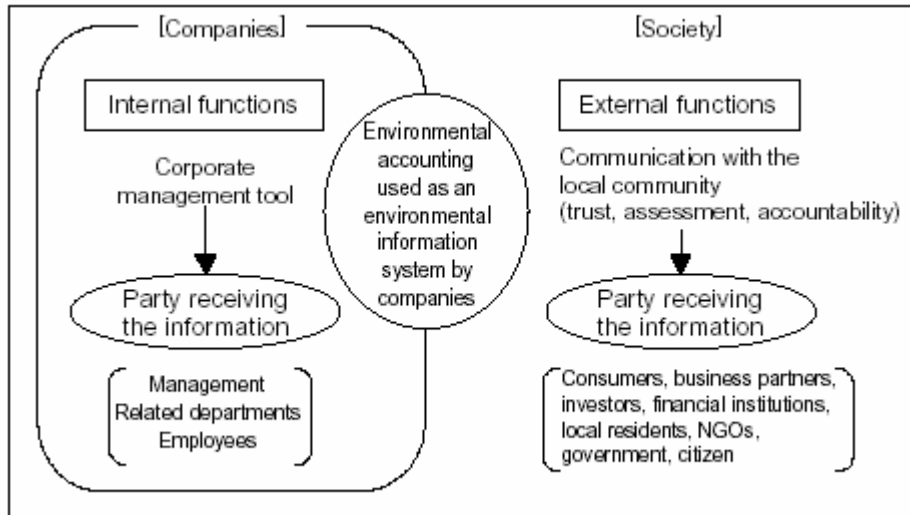
As one step of a company's environmental information system, internal function makes it possible to manage environmental conservation cost and analyze the cost of environmental conservation activities versus the benefit obtained, and promotes effective and efficient environmental conservation activities through suitable decision-making.

It is desirable for environmental accounting to function as a business management tool for use by managers and related business units.

### **(2) External Functions**

By disclosing the quantitatively measured results of its environmental conservation activities, external functions allow a company to influence the decision-making of stakeholders, such as consumers, business partners, investors, local residents, and administration.

It is hoped that the publication of environmental accounting results will function both as a means for companies to fulfill their responsibility for accountability to stakeholders and, simultaneously, as a means for appropriate evaluation of environmental conservation activities. [Explanation 03]



### [Explanation 03] Stakeholder Concerns

The concerns that stakeholders hold regarding the environmental information of companies and other organizations vary according to the stakeholder. Investors, business partners, and financial institutions focus their concerns mainly on corporate value viewed from the perspective of the financial aspects of the company or other organization. Consequently, they are concerned with issues such as effective investment of environmental conservation cost, whether the results of that investment are sufficiently in line with initial plans and are comparable with trends at other companies, and whether latent environmental risk, which can have a serious effect on future corporate value, is being dealt with sufficiently.

Stakeholders such as consumers, local residents, and environmental NGOs may be expected to analyze environmental accounting data from the perspective of issues such as the management of hazardous substances, the existence of proactive environmental activities and their results, details about latent environmental impacts and preventative measures, and other social responsibility issues.

Investors and financial institutions tend to use general, integrated information as the basis for decision making, and examine detailed information as necessary. Consumers and local residents, on the other hand, are particularly interested in pending issues. Furthermore, while in the past investors took an approach that mainly focused on the financial aspects of a company, recent years have witnessed an expansion in “Socially Responsible Investing” (SRI), and SRI-related areas of interest continue to increase.

At the same time, the people within the company, such as managers and employees, are involved in a broad range of financial and environmental aspects. For example, managers can be expected to analyze environmental accounting information from the standpoint of increasing corporate value, which is the basis for comparison with companies in the same business sector, and also for preventing the occurrence of major environmental problems that create a hindrance to improvement of corporate value. Employees are of course concerned with corporate social responsibility and increasing corporate value, but in addition they are concerned about the stable growth of the organizations to which they belong, ensuring their own employment and wage earning, and maintaining environmental safety at their workplace.



## 1.3 Basic Dimensions of Environmental Accounting

### (1) Relevance

Environmental accounting should provide valid information related to a company's environmental conservation costs and benefits from associated activities which contribute to the decision-making of stakeholders. [Explanation 04]

#### **[Explanation 04] Relevant to the Goal**

The goal is to provide information beneficial to stakeholders in their decision-making.

#### **a. Materiality and Significance**

Consideration should be given to the materiality and significance of relevance. [Explanation 05]

#### **[Explanation 05] Aspects of Materiality and Significance**

In environmental accounting, materiality is placed on the aspects of quantity and significance is placed on the aspects of quality. From the standpoint of the materiality, consideration is given to the quantitative impact of data that is expressed in monetary value or physical units. The significance focuses on the quality of information from the standpoint of environmental conservation or the future impact that it carries.

### (2) Reliability

Environmental accounting should eliminate seriously inaccurate or biased data and aid in building the trust and reliability of stakeholders.

#### **a. Faithful Representation**

When disclosing environmental accounting data, it should be represented accurately, faithfully.

[Explanation 06]

#### **[Explanation 06] Faithful Representation**

In addition to the fact that the information must be accurate and without error, it must represent the costs and benefits that could be reasonably expected to represent without misleading.

#### **b. Substance Over Form**

Information disclosure should not just be a mere formality of following steps laid out within these guidelines. When necessary, the company should determine an appropriate method of disclosure which conforms to and accurately describes the actual environmental activities being conducted. [Explanation 07]

#### **[Explanation 07] Prioritizing Substantiality**

In the event that the substantiality of the information is not fully communicated when following the format set out by these guidelines, necessary supplementary information should be provided to better explain reality.

#### **c. Neutrality**

Information that is disclosed taking a fair and impartial stance. [Explanation 08]

#### **[Explanation 08] Fair and Impartial Stance**

A fair and impartial stance is when the company avoids the arbitrary selection of information or intentionally direct readers toward a given conclusion.

#### **d. Completeness**

The scope of environmental accounting should extend to all material and significant information for all environmental conservation activities.

#### **e. Prudence**

Information that may be vague or unclear should be handled carefully and the nature, scope and grounds on which it is based should be made clear. [Explanation 09]

#### **[Explanation 09] Careful Handling**

Careful selection is necessary in regard to projected results and predicted comprehensive impact. If these results or impacts are disclosed then the premises and reasoning behind this information should be clearly stated to prevent any misunderstandings by stakeholders.

### **(3) Understandability**

By achieving understandability of disclosure of necessary environmental accounting data, environmental accounting should eliminate the possibility of any mistaken judgment about the company's environmental conservation activities. [Explanation 10]

#### **[Explanation 10] Easy to Comprehend Wording**

To ensure that the disclosed information is easy to understand for stakeholders, wording should be made as simple as possible. No matter how complex the content might be, it is necessary to disclose all essential information.

### **(4) Comparability**

Environmental accounting makes it possible for a company to make year-on-year comparisons. Information provided should be comparable with different companies in the same sector. [Explanation 11]

#### **[Explanation 11] Ensuring Comparability**

There are two methods for comparison: term, comparison of identical companies or organizations, and comparison between companies in the same business sector. It is essential that comparability be ensured when environmental accounting information is disclosed so as not to create misunderstandings amongst stakeholders. Nevertheless, due to the fact that environmental accounting information spans independent and divergent categories, simple comparisons are difficult when there are differences in the business sector, type of operation, or activities engaged in by the businesses. Therefore, in cases in which complex methods have been selected in order to acquire the information established in the Guidelines for use as bases for comparison, the content of said methods shall be clearly stated, and care shall be taken so as not to produce misunderstandings amongst stakeholders.

#### **(5) Verifiability**

Environmental accounting data should be verifiable from an objective standpoint. [Explanation 12]

#### **[Explanation 12] Verifiable Information**

Verifiable information is data for which the same results can be obtained when using premises, standards, and methods identical to those used by the party which created the data.

## **1.4 Structural Elements of Environmental Accounting**

Environmental accounting as defined under these guidelines consists of the following structural elements with the purpose of attaining two types of benefits derived from costs incurred from environmental conservation activities during the regular course of business.

### **(1) Environmental Conservation Cost**

Investments and expense related to the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities are measured in monetary value.

Investment amounts are expenditures allocated during a target period for the purpose of environmental conservation. The benefits from these investments are seen over several periods and are recorded as expense during the depreciation period (the amount of depreciable assets recorded during the period).

Expense amounts refer to the expense or losses recorded under financial accounting standards resulting from the consumption of goods or services for the purpose of environmental conservation.

#### **[Explanation 13] Depreciable Assets**

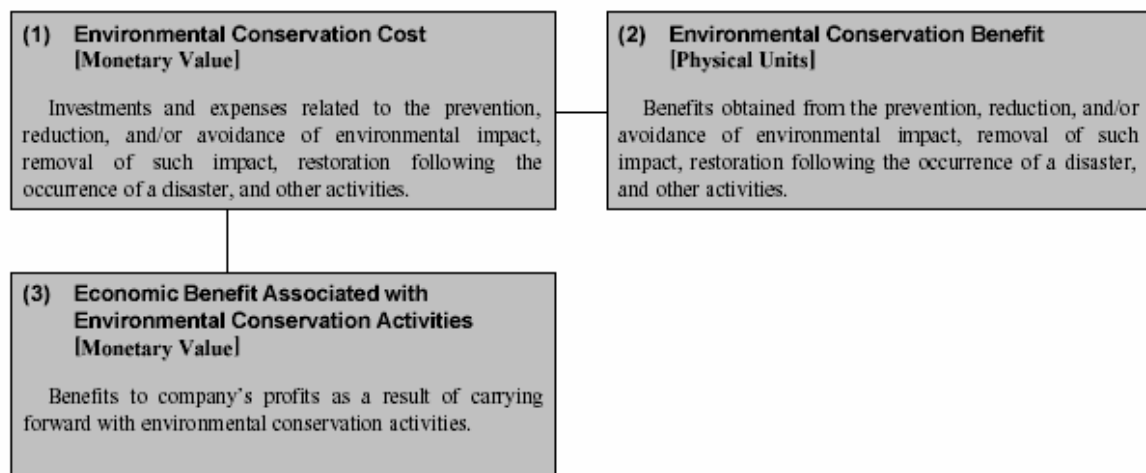
Depreciable assets are assets that progressively lose value either through use or the passage of time, and which therefore necessitate the allocation of cost. With the exception of land or construction suspense accounts, investment amounts include tangible fixed assets such as buildings, structures, and machinery and equipment, as well as intangibles such as goodwill, patents, software, etc.

### **(2) Environmental Conservation Benefit**

Benefits obtained from the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities are measured in physical units.

### **(3) Economic Benefit Associated with Environmental Conservation Activities**

Benefits to a company's profit as a result of carrying forward with environmental conservation activities are measured in monetary value.



The environmental conservation cost in the Guidelines is the cost borne by companies and other organizations for environmental conservation (i.e., private cost). They do not include costs borne for health damage or environmental pollution suffered by third parties or society as a whole resulting from the business activities of companies and other organizations (i.e., social cost). [Explanation 14]

**[Explanation 14] Social Cost**

There has been much research into the concept of social cost, but generally speaking it can be taken to mean the burden placed upon society as a result of the environmental impact of a specific company or other organization, or of an unspecified entity. Social cost is also referred to as “external cost” or “external diseconomy”.

For example, health damage suffered by a third party or damage caused to forests or agriculture due to environmental impact resulting from the business activities of a company or other organization will not result in a direct economic burden for that company or other organization provided that there is no proof of a causal relationship. Nevertheless, society as a whole may be considered to have sustained a loss.

## **2. Basic Environmental Accounting Elements**

### **2.1 Key Items Forming Bases of Environmental Accounting**

Environmental accounting is premised upon clarification of the objectives of engaging in environmental accounting. The objectives must conform to policies for environmental considerations made in the business activities of companies and other organizations, and with their environmental targets and environmental action plans.

The following items regarding the execution of environmental accounting are defined below:

- Target period
- Scope of calculations
- Environmental conservation cost and standards for measuring environmental conservation cost
- Environmental conservation benefit and standards for measuring environmental conservation benefit
- Items and standards for measuring the economic benefit associated with environmental conservation activities

### **2.2 Target Period and Scope of Calculations**

#### **(1) Target Period**

In principle, the target period covered should be the same as the period covered by the company's environmental report. Basically, information pertaining to the company's financial accounting, environmental activities and environmental accounting should all be coordinated to match the said company's business (fiscal) year.

#### **(2) Scope of Calculations**

In principle, the scope of calculations shall be the same as that for the company's environmental report. Basically, it must cover the business group. Nevertheless, if problems arise as a result of performing calculations for the business group as a whole, calculations shall be performed within a range covering the entire company and its business sites, with sequential calculations conforming to the actual operations of the company or other organization being desirable.

##### **a. Business Group**

The group as a whole is to be covered, including subsidiaries and related companies (henceforth, "related companies").

The business activities of a company or other organization include not only the standalone operations. It is necessary to perform environmental accounting calculations of the environmental conservation activities and environmental impact of the relevant company or other organization when, for example, said company or other organization transfers production operations to a related company.

[Explanation 15] [Explanation 58]

### **[Explanation 15] Scope of Related Companies**

The definition of related companies forming a business group is the same<sup>1</sup> as that for subsidiaries and related companies listed in a consolidated financial statement. The actual scope of consolidation shall be established to correspond to importance in terms of environmental conservation.

#### **b. Companywide**

Information pertaining to financial accounting, environmental conservation activities, and environmental accounting should be coordinated to use identical reporting units for the entire company.

#### **c. Business Site**

“Business sites” refers to individual business sites.

By employing environmental accounting at one of its individual business sites, the company can obtain information that can facilitate effective and efficient environmental conservation activities aimed at resolving the local community’s environmental issues. In addition, the disclosure of results can aid in promoting communications between the company and the local community, which is a major stakeholder.

<sup>1</sup> Please refer to “Scope of consolidation, Third General Standards” in “General Rules for Consolidated Financial Statements / Notes” (Business Accounting Council, Final Revision, June 1996) and “Handling of Revisions Concerning the Scope of Related Companies” (Business Accounting Council, October 1997).

### 3. Environmental Conservation Cost

Environmental conservation cost refers to the investment and costs, measured in monetary value, allocated for the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities.

#### 3.1 Scope of Environmental Conservation Cost

##### (1) Objective Standards

Whether a specific individual cost can be categorized as an environmental conservation cost depends on the objective standards.

Objective standards are those criteria for extracting cost that has been spent for the purpose of environmental conservation. [Explanation 16]

**[Explanation 16] Scope of Cost Outlaid for Environmental Conservation**

The judgement of whether or not a cost was outlaid with the goal of environmental conservation is made according to the objective standards. Therefore, efforts with the objective of environmental conservation made within that range are not limited to those for “end of pipe” equipment or facilities attached to an emissions terminus, but also include clean production efforts for the reduction of environmental impact.

##### (2) Investment Amount and Cost Amount

Investment amounts here refer to the expenditures of investment a company spends on depreciable assets for the purpose of environmental conservation.

This information helps to obtain information related to capital injected into environmental conservation activities, in the case that environmental conservation activities generate long-term benefits.

Expense amounts are portions of the company’s overall expenses and are the amounts used for the purpose of environmental conservation.

Tracking expense aids in obtaining information related to cost accrued to the current period to achieve benefit from environmental conservation activities.

Expense amounts shall include depreciation costs for depreciable assets. [Explanation 17]



### **[Explanation 17] Relationship between Investment Amount and Depreciation Cost**

When depreciable assets are acquired for the purpose of environmental conservation, they are posted as fixed assets for use in business, and listed as “investment amount” in environmental accounting.

These depreciable assets are not merely posted in the fiscal year in which they are required. After acquisition, the depreciation cost corresponding to the passage of time during which these assets are used during their period of usable life is converted to an expense. Therefore, the amount posted as an investment amount is again included in the future as an expense amount, and forms an environmental conservation cost.

The investment amount and the expense amount for environmental conservation differ in this way, and therefore they are not to be totaled.

## **3.2 Environmental Conservation Cost Categories**

### **3.2.1 Categories Corresponding to Business Activities**

Business activities are divided into categories including key business activities, administrative activities, R&D activities, and social activities, according to the relationship between the business and environmental impacts. Each environmental cost is then categorized according to the relevant business activity.

Key business activities span the range of goods and services purchasing through production and distribution. Administrative activities, R&D, and social activities are considered separate categories in the series of business activities through sales or services rendered.

#### **Categories corresponding to business activities**

Category	Content
Business area cost	Environmental conservation cost to control environmental impacts which result from key business operations within the business area
Upstream/downstream cost	Environmental conservation cost to control environmental impacts which result from key business operations upstream or downstream
Administration cost	Environmental conservation cost stemming from administrative activities
R&D cost	Environmental conservation cost stemming from R&D activities
Social activity cost	Environmental conservation cost stemming from social activities
Environmental remediation cost	Cost incurred for dealing with environmental degradation
Other cost	Other costs related to environmental conservation

#### **(1) Business Area Cost**

Business area costs are for activities to reduce environmental impact which occurs within the business area due to key business operations. The business area is the region where the company can directly manage environmental impacts. Business area cost associated with environmental conservation is divided into three categories, pollution prevention cost, global environmental conservation cost and resource recycling cost.

### **(1)-1 Pollution Prevention Cost**

Pollution prevention cost is cost made for efforts to reduce environmental impact, such as equipment or facilities attached to an emissions terminus (“end of pipe”) for the purpose of preventing pollution.

“Pollution” refers to damage to human health or the living environment created by damaging effects caused by business activities. In actual terms, typical forms of pollution are as defined in the Basic Environment Law, such as air pollution, water pollution, ground contamination, vibration, odor, and ground sinkage.

- 1) Cost for preventing air pollution (including acid rain)
- 2) Cost for preventing water pollution
- 3) Cost for preventing ground contamination
- 4) Cost for preventing noise pollution
- 5) Cost for preventing vibration pollution
- 6) Cost for preventing odor pollution
- 7) Cost for preventing ground sinkage
- 8) Cost for preventing other types of pollution

### **(1)-2 Global Environmental Conservation Cost**

Global environmental conservation costs are those costs associated with negative environmental impacts on the global environment or a wide portion of it, resulting from human activities. Costs are allocated for the prevention of global warming, to prevent the ozone depletion and other global environmental conservation efforts.

- 1) Cost for preventing global warming and energy conservation [Explanation 18]
- 2) Cost for preventing the ozone depletion
- 3) Cost for other global environmental conservation activities

#### **[Explanation 18] Cost for Preventing Global Warming**

Cost connected with the prevention of global warming includes expenses for curbing the emission of greenhouse gases, and also absorbing and solidifying such gases.

### **(1)-3 Resource Circulation Cost**

Resource circulation cost is defined as cost outlays made for sustainable cost circulation. Resource circulation efforts include the curbing of waste generation, the cyclical utilization of useable resources irrespective of market value (reuse, recycling, thermal recycling), and proper disposal of waste materials that are not recirculated.

- 1) Cost for the efficient utilization of resources [Explanation 18]
- 2) Cost for recycling industrial waste
- 3) Cost for recycling municipal waste
- 4) Cost for disposal of industrial waste [Explanation 19] [Explanation 20]
- 5) Cost for disposal of municipal waste [Explanation 19] [Explanation 20]
- 6) Cost contributing to resource circulation

**[Explanation 19] Cost for Efficient Utilization of Resources**

These include the costs of efforts to curb the consumption of natural resources and generation of waste. For example, this would include facility investment or improvements made to improve the yield rate for raw materials, water conservation and rainwater collection costs, etc.

**[Explanation 20] Cost for disposal of waste**

These include cost for mid-term disposal (with the exception of costs for reuse or recycling) and final disposal. For example, this would include cost for thermal recycling, the drying of sludge, and landfill cost.

**[Explanation 21] Characteristics of Cost for Final Disposal of Waste**

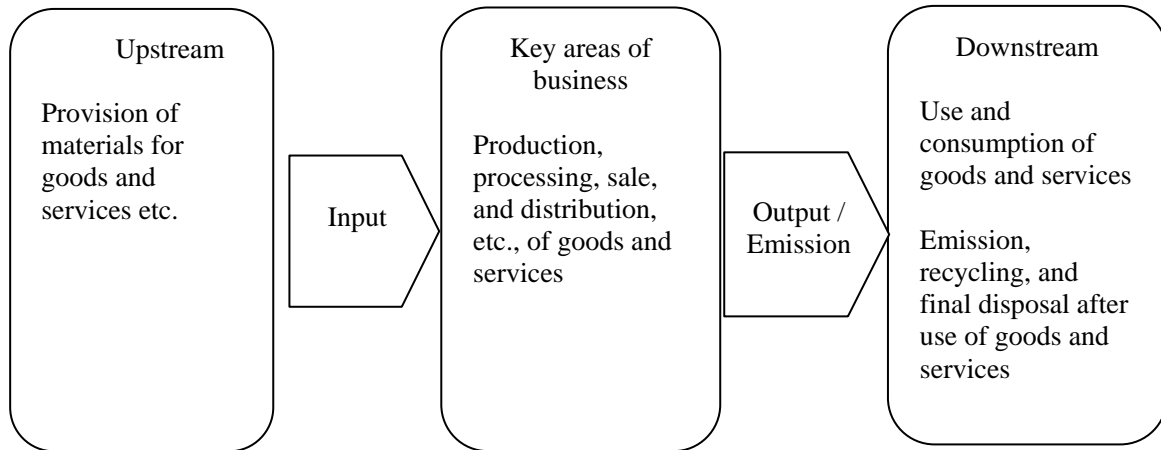
Cost for the final disposal of waste in landfills and by other means is not a cost incurred for the prevention of environmental impact; rather, it is a cost for dealing *ex post facto* with environmental impact that has already been created. Consequently, it is desirable that final waste disposal cost be low. It is possible to reduce such a cost through proper cyclical usage.

**(2) Upstream / Downstream Costs**

The Upstream / downstream costs refers to the following: “Upstream” cost is a cost for efforts to reduce the environmental impact that is created prior to the input of goods and services into business areas, as well as the cost related to such efforts; “Downstream” cost is a cost for efforts to reduce the environmental impact that is created after goods and services have been output from business areas, as well as the cost related to such efforts. [Explanation 22]

### [Explanation 22] Thinking behind Upstream and Downstream Costs

In the flow of goods and services, the upstream area is corresponding to the production of materials and supplies prior to the input of goods and services into the business area in which it is possible for the company or other organization to exert direct control on environmental impact. The downstream area is corresponding to the use, consumption, and emission of goods and services after their output from business areas. Activities related to input into or output from the key areas of business activity, such as materials purchasing or product shipment, are themselves considered business areas.



- 1) The difference in cost between goods and services procurement and purchasing methods that contribute to reduction of environmental impact (such as environmentally conscious products and so-called “green purchasing”) and typical goods and services procurement and purchasing methods.[Explanation 23] [Explanation 24]
- 2) Additional cost for supplying environmentally conscious products
- 3) Additional cost for reducing the environmental impact of containers and packaging [Explanation 25]
- 4) Cost for the collection, recycling, resale and proper disposal of used products [Explanation 26]
- 5) Other upstream and downstream costs [Explanation 27] [Explanation 28]

**[Explanation 23] Categories of Environmental Conservation Cost and Green Purchasing**

Environmental conservation cost categorized as a cost intended to reduce upstream or downstream environmental impact are designated upstream or downstream cost.

The areas of benefit by green purchasing are divided as follows, according to the items purchased: the upstream area, the key business area, and the downstream area. The cost associated with the purchasing of products for which the benefit is seen in the upstream or downstream areas is included in the upstream or downstream cost

**[Explanation 24] Difference from Typical Goods and Services Procurement and Purchasing Amounts**

The difference between procurement and purchasing amounts for goods and services that are typical in terms of function and the amounts for goods and services that provide an environmental conservation benefit in addition to the typical functions constitutes the environmental conservation cost.

**[Explanation 25] Additional Cost for Reducing Environmental Impact of Containers and Packaging**

The cost for reducing the environmental impact of the disposal of containers and packaging, such as the reduction of the weight of carryout bags and the use of reduced-environmental impact materials in containers and packaging, is included in the additional cost for reducing the environmental impact of containers and packaging.

**[Explanation 26] Cost for Collection, Recycling, Resale, and Proper Disposal of Used Products**

The cost for the collection, recycling, resale, and proper disposal of used products is considered a cost reduce the environmental impact of products during or after use (downstream cost).

**[Explanation 27] Other Upstream and Downstream Cost**

Other upstream and downstream costs include supply chain management cost, such as guidance provided to suppliers for environmental impact reduction or the creation of environmental management system.

**[Explanation 28] Categorizing Environmental Conservation Cost for Trade Associations**

A trade association's cost pertaining to environmental conservation activities associated with elements 1) – 4) above are recorded as other upstream/downstream costs

**(3) Administration Cost**

Administration cost is a cost for management activities conducted by companies and other organizations for environmental conservation activities. This includes the cost for efforts that indirectly contribute to reducing the environmental impact generated through business activities, and the cost for efforts for communications with society by companies and other organizations, such as those for environmental information disclosure.

- 1) Cost for the implementation and maintenance of an environmental management system
- 2) Cost for disclosure of environmental information associated with business activities and environmental advertising [Explanation 29]
- 3) Cost for monitoring environmental impact[Explanation 30]
- 4) Cost for environmental training of employees
- 5) Cost for environmental improvement activities, such as nature conservation, greening, beautification, and landscape preservation, at or in the vicinity of the business site

**[Explanation 29] Difference between Administration Cost and Social Activity Cost regarding Information Provision**

Items such as explanatory meetings for local residents and others for the provision of information concerning the effects of hazardous substances or the company's environmental measures, the display of company products at environmental events, or similar measures are categorized as provision of information pertaining to business activities.

In contrast, the holding of public symposiums regarding environmental issues, chemicals, or other topics, which are intended to provide information for the improvement of overall public knowledge, are categorized as social activity cost.

### **[Explanation 30] Cost for Environmental Impact Monitoring**

This is a cost for the focused monitoring of environmental impact on air, water, etc., and include costs (such as PRTR, etc.) for ascertaining the transfer and emissions of chemicals into the environment. The cost for equipment at individual pollution prevention facilities for measuring and monitoring the pollution situation is treated as individual pollution prevention cost item, because it is equipment operated within the facility as a whole.

Items such as patrols to check on effluent emissions systems or the situation in rivers and streams, the checking of pipes for the prevention of ground contamination, and other such efforts generate cost through their daily operations. Therefore, it is not necessary to categorize these in detail, but rather they may be included under the cost headings according to their main objectives.

### **(4) R&D Cost**

The cost constitutes spending for research and development activities allocated to environmental conservation. [Explanation 31]

- 1) R&D cost to develop products that contribute to environmental conservation
- 2) R&D cost to curtail environmental impact at the product manufacturing stage
- 3) Other R&D cost associated to the curtailment of environmental impact at the distribution stage or the marketing stage of products

### **[Explanation 31] Identifying R&D Cost**

Costs for the acquisition of equipment for use solely in pursuit of specific R&D aims, which cannot be used for any other purpose, as for patent rights, etc., are treated in financial accounting as R&D cost at the time of acquisition, and constitute environmental conservation cost.

In contrast, investment in facilities for R&D that is of a more generalized nature is booked under fixed assets, and therefore constitutes an environmental conservation cost investment amount.

### **(5) Social Activity Cost**

Social activity costs is a cost related to environmental conservation conducted for the good of the broad range of society. This is considered a cost for environmental conservation efforts consisting of social activities with no direct relationship to the business activities of the company or other organization. [Explanation 32]

- 1) Cost for environmental improvement activities, including nature conservation, planting of greenery, beautification and landscape preservation, with the exception of the business site
- 2) Cost related to donation or financial support of environmental groups
- 3) Cost associated with various social activities, such as the financial support of a local community's environmental conservation activities and the disclosure of information to the local community

### [Explanation 32] Scope of Social Activity Cost

The cost for environmental activities that are in actual substance conducted as part of the business as a whole is not a social activity cost. Activities that are in actual substance conducted as part of the business include items such as greening conducted in compliance with the Industrial Location Law, commercial planting conducted overseas, and nature conservation business conducted for profit. In contrast, voluntary greening business conducted for the prevention of desertification is categorized as a social activity cost.

### (6) Environmental Remediation Cost

Environmental Remediation costs are allocated for recovery of the environmental degradation due to business activities. [Explanation 33]

- 1) Cost to restore the natural environment back to its original state
- 2) Cost to cover degradation suits connected with environmental conservation
- 3) Provisions or insurance fees to cover degradation to the environment

### [Explanation 33] Characteristic of Environmental Remediation Cost

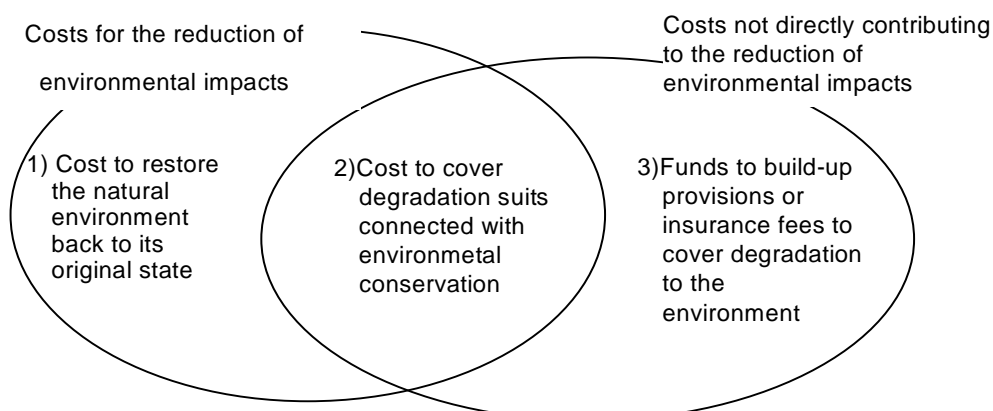
Costs to restore the natural environment back to its original state are those expenses incurred for the removal of environmental impacts.

Provisions or insurance fees are expenses evenly spread out a company's financial burden for dealing with environmental degradation after-the-fact, or as a means of hedging against such risks.

These costs do not directly contribute to the mitigation of environmental impact.

Costs for degradation suits represent those expenses incurred after some type of damage has occurred and do not directly contribute to the mitigation of environmental impact.

It is best for the company not to incur any environmental remediation costs. They can be reduced through the proper implementation of environmental conservation activities.



### (7) Other Cost

These are costs that do not fall under the category of costs enumerated thus far.



**3.2.2 Other Categories of Environmental Conservation Cost**

The evaluation of environmental conservation cost essentially must be performed based not merely on the monetary figures, but also according to the characteristics of the cost, the sector and type of company or other organization, and the implementation of past environmental conservation activities. Therefore, it is possible to take into consideration and categorize cost characteristics other than those corresponding to business activities. [Explanation 33]

For example, because of the broad range of environmental activities conducted by companies and other organizations, categorizing, ascertaining and evaluating according to items such as the measures taken regarding environmental problems or the type of environmental management activities conducted by the company or other organization establishes a clear correlation between environmental conservation cost and the environmental conservation benefit or the economic benefit associated with environmental conservation measures. This is effective in improving the usability of the environmental accounting data.

The categories listed below corresponding to areas of application of environmental conservation activities constitute these sorts of categories corresponding to cost characteristics. The relationship between individual environmental conservation cost and each area of execution of environmental conservation activities becomes clearer through these categories.

Categories corresponding to areas of application of environmental conservation measures

Category	Details
Cost related to global warming measures	Environmental conservation cost for reducing greenhouse gas emissions
Cost related to ozone layer protection measures	Environmental conservation cost for reducing the emissions of the ozone layer depletion substances
Cost related to air quality measures	Environmental conservation cost for reducing environmental impact caused by air emissions
Cost related to noise and vibration measures	Environmental conservation cost for reducing noise and vibration
Cost related to environmental conservation measures for the aquatic, ground, and geologic environments	Environmental conservation cost for maintaining and improving water quality, preventing sinkage, and preventing ground contamination, and for reducing environmental impact caused by emissions into water and ground.
Cost related to waste and recycling measures	Costs for reduction of waste generation and proper waste disposal, promotion of the recirculation of resources, and recycling
Cost related to measures for chemical substances	Environmental conservation cost for chemical risk management and for reducing the emissions of chemicals that cause environmental impact
Cost related to natural environmental conservation	Environmental conservation cost related to efforts to preserve the natural environment
Other cost	Other environmental conservation cost related to environmental conservation measures

**Explanation 34] Relationship between Environmental Conservation Cost Categories Corresponding to Business Activities and Other Categories of Environmental Conservation Cost**

The range of environmental conservation cost is basically the same. There is consistency between the total for categories corresponding to business activities and the total for categories corresponding to the characteristics of environmental conservation cost.

Furthermore, “other categories corresponding to the characteristics of environmental conservation cost” are ranked as complementary categories, and may be treated as covering only a portion of the environmental conservation cost. In such instances, the two categories are not consistent.

**3.3 Method for Aggregating Environmental Conservation Cost**

Environmental costs are classified as those directly associated with the environment or those with fall into a gray zone, partly environmental and partly not.

Those investments and costs falling into this gray zone will be referred to as “complex” costs herein.

**3.3.1 Cost Classified as Direct Cost**

Cost classified as direct cost is aggregated as environmental conservation cost.

**3.3.2 Complex Cost**

The following methods, listed here in order of preference, may be used to aggregate complex cost: difference aggregation; allocation aggregation based on reasonable methods; allocation aggregation based on simple methods.

**(1) Aggregating the Difference**

Aggregation of the difference of cost, other than environmental conservation cost, that has been deducted.

**(2) Cost Allocation**

In case in which the amounts of goods and services necessary as bases for comparison in difference aggregation is not absolutely clear, the allocation aggregation method, based on a fixed standard, may be used for aggregation.

**a. Rational Cost Aggregation**

In cases in which difference aggregation cannot be use, allocation aggregation is to be conducted according to reasonable proportion methods determined based upon the expenditure goals. Said reasonable methods are to be determined taking into account the content of the subject environmental conservation activities, the characteristics of the environmental conservation costs, the type of environmental impact, etc. [Explanation 34]

**[Explanation 35] Cost Allocation Based on Reasonable Methods**

**(1) Personnel Cost**

The actual work content is to be considered. For example, a distribution rate for hours spent working on environmental conservation activities versus those spent on other tasks is to be used.

**(2) Depreciation Cost**

The proportion of the acquisition amount of the overall facility in question that consists of the facility's environmental conservation function or of the site acquisition amount may be used; or, use the ratio of total space used in the same plant.

**b. Allocation Based on Simple Methods**

When neither difference aggregation nor allocation aggregation based on reasonable methods can be used, allocation aggregation is to be performed through the determination of a simple cost allocation rate. Simple methods are established based upon the assumption of a set correlation, and therefore the main content of the standards and the premises of the assumptions made are to be noted. [Explanation 36]

**[Explanation 36] Cost Allocation Based on Simple Methods**

**(1) When environmental conservation cost accounts for a sufficient portion of a particular cost**

For example, a set percentage such as 10% or 50% can be used to define the portion of the expense that is an environmental conservation cost.

**(2) When the major portion of a complex cost is recognized as an environmental cost**

The total amount is classified as an environmental cost.

**(3) When the cost clearly represents a minor portion of total environmental cost**

This cost category need not be aggregated.

## 4. Environmental Conservation Benefit

Environmental conservation benefit is measured in physical units <sup>2</sup> and is the benefit obtained from the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities.

### 4.1 Categories of Environmental Conservation Benefit

Environmental conservation benefit is divided into 4 categories based upon the relationship to business activities, and each is measured using the performance indicators listed in the Environmental Performance Indicator Guidelines <sup>3</sup>. [Explanation 37]

#### **[Explanation 37] Relationship to Environmental Conservation Cost Categories**

The environmental conservation cost categories corresponding to business activities and the four categories of environmental conservation benefit according to the relationship to business activities are roughly arranged as follows:

- (1) Benefit corresponding to key business area cost and upstream/downstream costs is applicable to the environmental conservation benefit related to resources input into business activities.
- (2) Benefit corresponding to key business area cost is applicable to the environmental conservation benefit related to waste or environmental impact originating from business activities.
- (3) Benefit corresponding to key business area cost and upstream/downstream costs is applicable to the environmental conservation benefit related to goods and services produced from business activities.
- (4) Administration cost, R&D cost, social activity cost, and others are mainly applicable to other types of environmental conservation benefit, depending upon the details.

Given that in practical terms, many other approaches are conceivable. The categorization of environmental conservation benefit should correspond as closely as possible to the environmental conservation cost categories from the standpoint of cost-effectiveness.

<sup>2</sup> The abbreviations used to denote physical units in this Guideline are as follows:

J : Joules, representing calorific value; t : Tons, which are units of weight; t-CO<sub>2</sub> : Unit for conversion of CO<sub>2</sub> to tons; m<sup>2</sup> : Square meters of surface area; m<sup>3</sup> : Cubic meters of volume; t · km : the product of weight (tons) and distance (kilometers); mg/l : Content (milligrams) per unit of volume (liter); dB : Decibels, which are units representing sonic pressure and force.

<sup>3</sup> The latest material available at the time of publication of these Guidelines was “The Guideline for Environmental Performance Indicators for Businesses- 2002 Edition” (Ministry of the Environment, April 2003)  
URL : <http://www.env.go.jp/policy/report/h15-01/index.html>

Companies and other organizations may select and employ effective indicators for ascertaining and evaluating environmental conservation benefits according to their actual business conditions. [Explanation 38] [Explanation 39]

**(1) Environmental Conservation Benefit related to Resources Input into Business Activities**

The environmental conservation benefit related to resources input into business activities is measured using the following indicators:

- 1) Total energy input volume (J)
- 2) Input volume of specially controlled substances (t)
- 3) Water input volume (m<sup>3</sup>)

**(2) Environmental Conservation Benefit related to Waste or Environmental Impact Originating from Business Activities**

The environmental conservation benefit related to output from business activities is measured using the following indicators:

- 1) Volume of greenhouse gas emissions (t-CO<sub>2</sub>)
- 2) Volume of specially designated chemicals transferred or emitted (t)
- 3) Total waste emissions volume (t)
- 4) Total wastewater volume (m<sup>3</sup>)

**(3) Environmental Conservation Benefit related to Goods and Services Produced from Business Activities**

The environmental conservation benefit when goods and services are used or emitted is measured using the following indicators:

- 1) Volume of energy consumed at time of use (J)
- 2) Volume of output of materials causing an environmental impact at time of use (t)
- 3) Volume of output of materials causing an environmental impact when discarded (t)
- 4) Volume of products recirculated, such as products, containers, and packaging collected after use (t)

**(4) Other Environmental Conservation Benefit**

While various other environmental conservation benefits also exist, the environmental conservation benefits related to distribution, transport, and stock pollution are measured using the following indicators:

- 1) Transport volume of products and materials (t-km)
- 2) Volume of emissions of materials associated with transport that cause an environmental impact (t)
- 3) Surface area, volume of contaminated ground (m<sup>2</sup>, m<sup>3</sup>)

The relationship between the environmental conservation benefit using the environmental performance indicators and business activities is as shown in the table below.

**[Explanation 38] Selection of Environmental Performance Indicators**

The environmental performance indicator guidelines consist mainly of indicators for the purpose of showing the materials flow of a company or other organization. Consequently, in choosing indicators for ascertaining environmental conservation benefit, take into consideration whether or not the environmental performance indicator can properly express the reduction in the environmental impact of the company or other organization.

**[Explanation 39] Expressing Environmental Conservation Benefit according to Environmental Performance Indicators**

When the environmental conservation benefit is expressed through environmental performance indicators, it is shown in terms of the level of volume decrease. The indicators can also be used to show levels of increase or ratios.

When expressing these in terms of volume, the difference in total volume between the current term and the base period is measured. The comparative difference from the standard unit may be entered in parallel.

When expressing a ratio, the ratio of the current term versus the base period, or the difference between the two, is shown.

The following table shows the relationship between environmental conservation benefit according to environmental performance indicators and business activities.

**Examples of Environmental Conservation Benefit Categories and Environmental Performance Indicators  
(Classification according to relationship with business activities)**

Environmental conservation benefit categories	Environmental performance indicators (Units)
Environmental conservation benefit related to resources input into business activities [Explanation 40] [Explanation 41]	Total energy input volume (J) Energy input volume by type (J) Input volume of specially controlled substances (t) Input volume of circulated resources (t) Input volume of water (m <sup>3</sup> ) Input volume of water by source (m <sup>3</sup> )
Environmental conservation benefit related to waste or environmental impact originating from business activities [Explanation 42] [Explanation 43] [Explanation 44]	Volume of greenhouse gas emissions ( t-CO2 ) Volume of greenhouse gas emissions by type or by emissions activity (t-CO2 ) Volume of specially designated chemicals transferred or emitted (t) Total waste emissions volume (t) Final waste disposal volume (t) Wastewater volume (m <sup>3</sup> ) Water quality (BOD,COD) (mg/l) NOx, SOx emissions volume (t) Foul odor (Highest concentration) (mg/l)
Environmental conservation benefit related to goods and services produced from business activities [Explanation 45]	Volume of energy used at time of use (J) Volume of output of materials causing an environmental impact at time of use (t) Volume of output of materials causing an environmental impact when discarded (t) Volume of products recirculated, such as products, containers, and packaging collected after use (t) Volume of containers and packaging used (t)
Other environmental conservation benefit [Explanation 46]	Volume of emissions of materials associated with transport that cause an environmental impact (t) Transport volume of products and materials (t-km) Surface area, volume of contaminated ground (m <sup>2</sup> . m <sup>3</sup> ) Noise (dB) Vibration (dB)

**[Explanation 40] Total Energy Input Volume**

Purchased electricity and fuel are converted to heat values in expressing total energy input volume

**[Explanation 41] Specially Controlled Substance**

Among the resources input, there are some substances with a risk of toxic effect if they are output into the environment. Specially controlled substance is a substance that are controlled at the company or other organization from the perspective of the environmental impact.

#### **[Explanation 42] Special Chemical**

Special chemical is a chemical that is controlled at the company or other organization with the objective of preventing the output or transfer into the environment.

In this case, “chemical” refers to substance specified in which laws and ordinances apply, such as the “Air Pollution Prevention Law”, the “Special Measures Law for PCBs <sup>4</sup>”, the “Dioxin Law <sup>5</sup>”, and the “PRTR Law <sup>6</sup>”.

#### **[Explanation 43] Final Waste Disposal Volume**

The final waste disposal volume is the portion of the total volume of waste that is subject to final disposal, such as landfill disposal, after measures such as recirculation or volume reduction have been implemented.

#### **[Explanation 44] Pollution Impact Volume**

The pollution impact volume (t) is useful as an environmental performance indicator for ascertaining the water quality (BOD, COD) that is intertwined with the total volume. The volume is expressed according to the total wastewater volume and its contaminant concentration (BOD, COD) product.

#### **[Explanation 45] Environmental Impact at time Goods and Services are Used or Disposed**

The environmental impact at the time the goods and services are used or disposed includes the energy used and the output of materials causing an environmental impact at the time of use of goods and services by the end user, and the various types of waste generated, including hazardous substances, when goods are discarded.

#### **[Explanation 46] Area and Volume of Contaminated ground**

The area of contaminated ground is the area or volume of contaminated ground at the end of the period, for example land that is listed in the Designated Zone Ledger based upon the Ground Contamination Measures Law, areas that have been contained or quarantined, and areas of land restored to their original condition as a result of reclamation work.

<sup>4</sup> Law Concerning Special Measures Against PCB Waste: Law concerning special measures for the promotion of proper disposal of polychlorinated biphenyl (PCB) waste.

<sup>5</sup> Dioxin Law: Law concerning special measures to be taken regarding dioxins.

<sup>6</sup> PRTR Law: A law intended to promote the improvement of control and monitoring of emissions into the environment of specific chemicals.



**4.2 Method for Measuring Environmental Conservation Benefit**

The environmental conservation benefit is measured as the difference between the environmental impact volume during the base period and the environmental impact during the period under audit. As a rule, the base period will be the previous fiscal term.

The difference in environmental impact volume between the base period and the current period refers to the benefit gained through environmental conservation activities, which is deemed to be difference in the total volume of environmental impact for the two periods.[Explanation 47] [Explanation 48] [Explanation 49]

$$\begin{aligned} \text{Environmental conservation benefit} &= \text{Total environmental impact volume of base period} \\ &\quad - \text{Total environmental impact volume of current period} \end{aligned}$$

In calculating the total volume of environmental impact, it is necessary to evaluate the environmental conservation activities through a reasonable that reflects the actual activities being executed.

**[Explanation 47] Comparison after Adjustment for Volume of Business Activities in the Base Period**

The environmental impact volume for the base period is adjusted according to the increase or decrease in business activity in comparison with the current period. This method calculates the difference between the environmental impact volume for the current period and the adjusted value for the base period.

$$\begin{aligned} \text{Environmental conservation benefit} &= \text{volume of environmental impact in the base period} \times \\ &\quad (\text{volume of business activity in the current period} / \text{volume of business activity in the base period}) \\ &\quad - \text{volume of environmental impact in the current period} \end{aligned}$$

By using this method, even if the total environmental impact volume increases due to an increase in the volume of business activity, the environmental conservation benefit can be measured if the standard unit for the current term is modified. Therefore, it is necessary to evaluate the results in tandem with the fluctuation in the total volume of environmental impact of the company or other organization.

**[Explanation 48] Location where Environmental Conservation Benefit is Manifest at Time Goods and Services are Used or Disposed**

The environmental conservation benefit manifest through the use by consumers of goods and services that take the environment into consideration can be included in the environmental conservation benefit of the company or other organization that produced the goods and services.

In this case, because the environmental conservation benefit at the location of the purchaser is also calculated, it is possible to book the same environmental conservation benefit reduplicatively for separate companies and other organizations.

#### **[Explanation 49] Measurement of Benefit Associated with Cost for Maintenance**

The cost for maintenance is a cost for keeping or maintaining the volume of environmental impact at a fixed level. It is not possible to ascertain the difference of cost for maintenance for the base period versus the current period.

The benefit of the cost for maintenance can be evaluated according to whether or not the level of environmental impact sought by the company or other organization through its control efforts has been achieved. Furthermore, in cases in which the goal of the control efforts of the company or other organization has been established by laws and regulations or is based on various fixed standards, the benefit may be measured in terms of the difference between the actual total volume of environmental impact and the values for environmental impact established by law or other fixed standards.

### **4.3 Identification of Environmental Conservation Benefit Based upon Environmental Conservation Cost Categories**

In cases in which the treatment of the entirety of environmental conservation cost and environmental conservation benefit is difficult, it is possible to ascertain and extract only those environmental conservation cost and environmental conservation benefit concerning relevant items by establishing the important environmental performance indicators that are appropriate to the actual situation at the company or other organization.[Explanation 50] [Explanation 51]

#### **[Explanation 50] Cost and Benefit Relationship**

The cost/benefit relationship can vary: there are cases in which the environmental conservation benefit corresponds directly to specific environmental conservation activities; cases in which the environmental conservation activities are complex and therefore do not correspond individually; and cases in which the relationship is unclear because neither the cost nor the benefit can be ascertained. There are therefore instances in which sampling the environmental conservation benefit that correspond in practical terms to each environmental conservation cost category is problematic.

#### **[Explanation 51] Establishment of Key Environmental Performance Indicators**

Each company or other organization must select the key environmental performance indicators by taking into account the effect upon the environment of business activities and goods and services. The indicators relevant to most companies and other organizations, in which majority of stakeholders take an interest, include greenhouse gas emissions, total waste production, and the emissions or transfer volume of special chemicals.

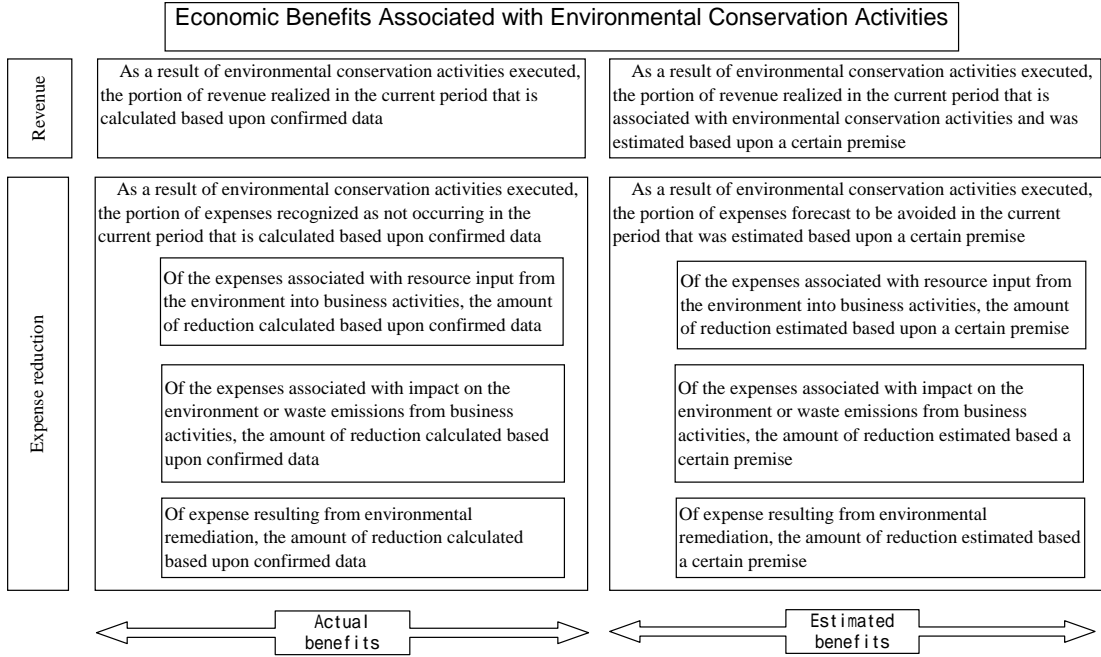
# 5. Economic Benefit Associated with Environmental Conservation Activities

The economic benefit associated with environmental conservation activities is contribution to the profit resultant of environmental conservation activities a company or other organization carries out, as measured in monetary value.

## 5.1 Economic Benefits Associated with Environmental Conservation Activities

The economic benefit associated with environmental conservation activities is divided into actual benefits and estimated benefits depending on whether the data is confirmed. Actual benefits are the economic benefit measured based on confirmed data. Estimated benefits are those economic benefits measured based on a certain premise.

The table below illustrates the results of adjustment of economic benefit from the perspective of profit and expense reduction.



### 5.1.1 Actual Benefit

#### (1) Revenue

The portion of revenue realized in the current period resulting from environmental conservation activities executed that is calculated based upon confirmed data.

This includes items such revenue from the sale of recycled products and of unusable products produced through key business activities.

#### (2) Expense Saving

The portion of expenses recognized as avoided in the current period resulting from environmental

conservation activities executed that is calculated based upon confirmed data.

**a. Expenses Associated with Resource Input from Environment into Business Activities**

Savings on expenses associated with resource input include items such as savings amounts for items such as materials expense savings corresponding to use of recycled resources or efficient use of resources, energy expense savings through energy conservation, and water expense savings through the use of recirculated water.[Explanation 52]

**[Explanation 52] Expense Savings through Lower Resource Input**

When environmental resources are input into business activities, various costs related to the usage of raw materials, energy and water are incurred. The consumption of resources in itself causes environmental impact. By reducing the input of resources through environmental conservation activities, a company not only reduces its environmental impact but also reduces costs related to the use of raw materials, energy, and water.

**b. Expenses Associated with Impact on Environment or Waste Emissions from Business Activities**

Savings on expenses associated with environmental impact or waste emissions from business activities include savings on legally-required contributions due to reduction of emissions of substances deemed by law to have an environmental impact, savings on disposal costs through reduction in the volume of waste, and savings on wastewater treatment expenses through the use of recirculated water.

**c. Expense Saving for Environmental Remediation**

These are the amount which a company can reduce its conventional expenses for environmental remediation, such as funds for additions to reserves and insurance premium payments in the current period.

**d. Other Expense Saving**

In addition to those outlined above, various other expense savings may be posted depending upon the actual situation at the company or other organization.[Explanation 53]

**[Explanation 53] Other Expense Saving**

Items such as saving in personnel cost or other business expenses achieved through improved efficiency in environmental management may be included. In addition, saving in interest cost achieved through the use of the low-interest financing system for environmental consideration may also be included.

### 5.1.2 Estimated Benefit

Estimated benefit is mainly envisaged as a tabulation category for internal use, consisting of information useful in business management. Given that estimate factors assume a large role in making comparisons with the actual benefits gained, it is necessary to treat the estimated benefit with care.[Explanation 54]

The details of estimated benefit are as follows:

#### (1) Revenue

This is the portion of revenue realized in the current period as a result of environmental conservation activities executed that is estimated based upon a certain premise.

One example is the portion of the additional revenue amount gained through contributions made by environmental conservation R&D or environmental conservation investment that was realized in the current period.

#### (2) Expense Saving

This is the portion of expenses forecast to be avoided in the current period as a result of environmental conservation activities executed that is estimated based upon a certain premise.

For example, this includes those saving achieved through avoidance of damage compensation or remediation cost and reduction of fund procurement cost through increased enterprise value due to prevention of environmental damage that were forecast to for the current period.

#### [Explanation 54] Meaning of Estimated Benefit

Focusing on the estimated benefit gives a broad picture of the possibilities for the environmental conservation efforts of companies and other organizations to contribute to their profitability. Therefore, it is of assistance in making judgments as whether to proceed with environmental conservation activities.

Nevertheless, estimates of benefit are to a certain degree unreliable, and therefore it is necessary to assess and clarify the assumptions that form the bases for estimation, so as to keep unreliability to a minimum.

## 5.2 Method for Measuring Economic Benefit Associated with Environmental Conservation Activities

There is no established method to measure estimated benefit when measuring the economic benefit associated with environmental conservation activities. These guidelines only propose a method for the actual benefit.

For revenue, the results of environmental conservation activities are posted as revenue to the financial statements for the current period.

In instances in which expenses have been reduced, the difference in expenses between the base period and the current period according to the method used to calculate the environmental conservation benefit is deemed to be the expense avoided as a result of environmental conservation activities executed, and is measured using the following formula:[Explanation 55]

Economic benefit associated with environmental conservation activities (expense reduction)

=Expense in the base period – Expense in the current period

**[Explanation 55] Comparison after Adjusting Volume of Business Activity in Base Period**

Adjust the expense incurred in the base period depending on the fluctuation in volume of business activity between the base and current periods. The adjusted value is then used to measure the difference in expense incurred in the current periods.

$$\begin{aligned} & \text{Economic benefit associated with environmental conservation activities} \\ & = \text{Expense incurred in the base period} \\ & \quad \times (\text{Volume of business activity in the current period} / \text{volume of business activity in the base period}) \\ & \quad - \text{Expense incurred in the current period} \end{aligned}$$

**5.3 Method for Evaluating Economic Value of Environmental Conservation Benefit**

The economic benefit associated with environmental conservation activities described in 5.1 and 5.2 above is the revenue or expense savings ascertained in terms of monetary value, while the environmental conservation benefit described in Chapter 4 is an attempt to evaluate its economic value.

The economic value of the environmental conservation benefit is an evaluation of the environmental conservation benefit as expressed in monetary value based upon fixed environmental impact conditions as measured in physical units.

Integrating a multiple number of environmental conservation benefit into a single indicator makes it easier to analyze the relationship between environmental conservation cost and environmental conservation benefit. This should also make it useful in making business decisions and evaluating business performance.[Explanation 56] [Explanation 57] [Explanation 58]

**[Explanation 56] Relationship between Economic Benefit Associated with Environmental Conservation Activities and Evaluation of Economic Value of Environmental Conservation Benefit**

The environmental conservation benefit described in Chapter 4 is beneficial not on to companies and other organizations, but also to society as a whole (social benefit). The evaluation of the economic value of the environmental conservation benefit through, for example, calculation in terms of monetary value is the economic value evaluation of the environmental conservation benefit. In contrast, the economic benefit associated with environmental conservation activities described in 5.1 and 5.2 above is the contribution made to the profitability of the company or other organization. Therefore, these two items are of a different nature. On the other hand, there are instances in which an environmental conservation benefit is simultaneously tied to economic benefit associated with environmental conservation activities. An example would be the reduction of energy input resulting in a savings in energy usage through improvements made in energy efficiency.

The evaluation of the economic value of environmental conservation benefit discussed in 5.3 is also applicable in instances in which the economic value of the environmental conservation benefit at the time goods and services are used or discarded is evaluated and converted to monetary value.

**[Explanation 57] Items to be Considered when Evaluating Economic Value of Environmental Conservation Benefit**

There already are a number of studies and practical examples of methods for evaluation of the economic value of environmental conservation benefit, but the stage has yet to be reached at which they can be applied within practical limits. Consequently, strict care must be maintained in clarifying the limits and special characteristics of the method used, grounds, and data presumptions, in particular so as not to create misunderstandings amongst stakeholders.

**[Explanation 58] Possibilities for Integration into a Single Indicator**

The volume of environmental impact is measured according to differing units, and therefore it is impossible to make a simple comparison of the interrelated importance of the various units. For such a case, the attempt is made at integration into a single indicator, by establishing and weighting fixed assumptions and employing coefficients according to similar past results or estimated values based upon them, or by using the results of research. The expression of monetary value is also a form of this, except in instances in which a market exists.

## 6. Treatment of Consolidated Environmental Accounting

The business activities of companies and other organizations in the modern socio-economic system have expanded in scale, diversified, and become globalized to a degree not experienced previously. A great number of companies have been established corresponding to each purpose, and group management is practiced.

In a group management system, the independent decision-making ability of group companies is limited. At the same time, the primary objective becomes management of the group, limiting the environmental impact of the holding company itself, which essentially consigns functions such as production, sales, and distribution. In such cases it becomes difficult to perceive the actual environmental conservation activities from the data for individual corporate units assembled under a legal structure.

Consolidated data reflecting economic activity is already part of the mainstream in financial accounting, but it is also necessary in environmental accounting to focus on environmental impact within the broader scale of the supply chain to the greatest extent possible, so as to make it possible to understand the costs of environmental conservation within business activities and the benefits derived from them.

It is therefore necessary in environmental accounting as well to ascertain and evaluate data reflecting the actual business activities of the consolidated group (business group), rather than of each individual unit of the company or other organization, in order to understand the actual situation at the company or other organization.

### 6.1 Scope of Consolidation

The consolidation range for environmental conservation goals has been established corresponding to importance in terms of environmental conservation.

The standards for determining importance take into consideration the particular business group's environmental impact. In particular, this means specifying the significant areas of environmental impact resulting from the kinds of business activities engaged in by the business group, focusing on the organizations listed below:

- Related companies contributing greatly to the volume of environmental impact based upon environmental performance indicators that take into consideration the significant areas of environmental impact;
- Related companies participating greatly in the environmental conservation cost for environmental conservation activities, taking into consideration the significant areas of environmental impact;
- Related companies that are judged to have a significant qualitative environmental impact, even if the volume of environmental impact is not great.[Explanation 59]

Determinations about the consolidation scale may also be made in line with that of the consolidated financial statements.



### **[Explanation 59] Organization with Significant Qualitative Environmental Impact**

Organizations that have a significant qualitative environmental impact, even if the volume of impact is not great, the environmental impact of the business group overall include. For example, related companies that handle chemicals with significant environmental impact, such as PCBs, even if their percentage of the business group's overall chemical emissions or transport volume is low. Also, companies performing a significant environmental conservation function, such as those dedicated exclusively to the collection of used products from the market, would be included, even if their percentage of the business group's overall waste emissions volume is low.

## **6.2 Consolidated Environmental Accounting Aggregation**

Consolidated environmental accounting treats organizations composed of a number of companies as a single entity and aggregates their results. The typical flow of aggregation proceeds as outlined below:[Explanation 60]

- The consolidation scope is determined;
- The environmental accounting data for the individual members of the business group is aggregated
- The environmental accounting data for the individual members is combined;
- Double booking due to internal transactions is eliminated.

Of these, the cost and benefit derived from internal transactions conducted among members of the same business group are combined, and the portion that was double booked is eliminated.

### **(1) Aggregation of Environmental Conservation Cost**

The double booking of environmental conservation cost through internal transactions conducted among members of the same business group should be eliminated to the greatest extent possible.

### **(2) Calculation of Environmental Conservation Benefit**

In principle, the environmental conservation benefit calculated for each member of the same business group is to be combined. Benefit clearly double booked is to be eliminated.

### **(3) Calculation of Economic Benefit Associated with Environmental Conservation Activities**

In principle, the economic benefit calculated for each member of the same business group is to be combined. Benefit clearly double booked is to be eliminated.

### **[Explanation 60] Treatment of Equity Ratio in Aggregation**

Methods for aggregating the environmental accounting data for related companies include aggregating the total or gross amount, or aggregating amounts or volume multiplied by the equity ratio of each related company.

## 7. Disclosure of Environmental Accounting Information

The Guidelines recommend the voluntary disclosure of environmental accounting information from the standpoint of the external functions of environmental accounting, by means of the environmental report.

While the Guidelines provide consideration of a simple approach corresponding to the actual situation at a company or other organization, the actual data disclosed is to be determined by the company or other organization itself. Therefore, it is necessary when disclosing environmental accounting data externally to clarify the preconditions of the data disclosed, so that stakeholders gain a consistent understanding of the environmental accounting data. This chapter outlines the basic items involved in the disclosure of environmental accounting data.

The following items are noted with regard to environmental accounting disclosure:

- Processes and results of environmental conservation activities
- Key items forming the bases of environmental accounting
- Aggregated results of environmental accounting [Explanation 61]

### 7.1 Processes and Results of Environmental Conservation Activities

With regard to the aggregated results of environmental accounting, the company or other organization shall provide a summary and the results of the environmental conservation activities it emphasizes, an explanation of the aggregated results of environmental accounting (including an evaluation of large and small figures and the reasons for increases or decreases in comparison with the previous period), and the policies activated with regard to future environmental conservation activities.

#### **[Explanation 61] Explanation of Aggregated Results of Environmental Accounting**

The company or other organization shall provide an explanation as follows of the evaluation of its own analysis, so that stakeholders can easily understand the aggregated results.

##### **(1) Explanation of Aggregated Results as Related to Management Profile of Company or Other Organization**

In instances in which changes occurred in the management environment of the company or other organization, such as mergers, breakups, construction or closing of plant facilities, fluctuations in business results, large-scale outsourcing, etc., the details and the effects of these changes on current and future aggregated results are to be explained.

## **(2) Explanation of Aggregated Results as Related to Actual Environmental Impact of Company or Other Organization and Environmental Conservation Activities**

A background explanation is to be provided when the aggregated results for environmental accounting that reflect the actual environmental impact of the company or other organization, particularly in the even of large figures or striking increases or decreases (including unexpected events such as occurrences of environmental damage). For example, this would include instances such as a jump in environmental conservation cost, in particular R&D cost, or a sharp reduction in CO2 emissions among the environmental conservation benefit. In such instances, the main causes of changes in business activity volume or production modes would be analyzed.

It is effective as well to indicate the environmental conservation goals and progress in relation to the efforts made in terms of environmental conservation activities.

## **(3) Explanation of Aggregated Results as Related to Past Environmental Conservation Activities**

There is a tendency for the benefit of environmental conservation activities to diminish over the course of time, even when costs are expended in addition to the original amount. In such instances, an explanation of the aggregated results for the current period as related to past environmental conservation activities is to be provided, rather than the simple cost vs. benefit for the period under review.

## **7.2 Key Items Forming Bases of Environmental Accounting**

### **(1) Status**

1) Target period [Explanation 62]

2) Scope of aggregation [Explanation 63]

- In the case of business groups, the overall number of related companies, the names of the main related companies, and the criteria for the related companies
- In cases in which only certain business are targeted, the names of the business sites and the criteria for the business sites

### **[Explanation 62] Target Period**

In cases in which the target period is not the fiscal year, the reasons for that are to be noted.

Also, in cases in which there are related companies within the range of aggregation, i.e., the business group, that have a target period for environmental accounting different from that of the company or other organization, the names of those related companies and their target periods are to be noted.

### **[Explanation 63] Scope of Aggregation**

In establishing the consolidation range, note the attitude toward the importance of environmental conservation within the business group, and describe the actual criteria.

## **(2) Content and Calculation Standards for Environmental Conservation Cost**

### 1) Aggregation of depreciation cost

- In cases in which there are no particular costs included in the depreciation cost, make a note to that effect.
- In cases in which the period of depreciation used is different from that used in financial accounting, make a note to that effect providing the details and the reasons.

### 2) Standards for booking complex cost [Explanation 64]

- The main details of environmental conservation costs for which differences are aggregated, the aggregation method, and the reasoning concerning costs other than environmental conservation cost
- The main details of environmental conservation costs subject to allocation aggregation, the aggregation method, and the allocation standards
- For allocation aggregation based on simple methods, the main details of environmental conservation cost for which the total amounts are aggregated
- While it is assumed that environmental conservation cost is included, the details of environmental activities not subject to aggregation

#### **[Explanation 64] Entry for Booking Standards for Complex Cost**

In cases in which the booking standards differ according to the type of environmental conservation cost, note the details of the main methods used for each.

### 3) Booking standards when aggregating categories corresponding to environmental conservation activities:

- The philosophy and main breakdown of categories for areas of environmental conservation activities
- In cases in which the total for categories corresponding to business activities and the total for the areas of environmental conservation activities differ, provide details

## **(3) Details of Environmental Conservation Benefit and Calculation Standards**

### 1) Definition of environmental impact calculated as environmental conservation benefit

### 2) Calculation formula and reasoning behind the range of measurement of the environmental conservation benefit

### 3) Period in which the investment benefit used in calculating the environmental conservation benefit is manifest, and the grounds for its selection

### 4) Details and grounds for the physical units and conversion units used

### 5) In particular, in cases in which environmental conservation benefits at the time goods and services are used or discarded are disclosed, make note of this providing the details, range of calculation, calculation formula, and reasoning

### 6) The reasoning behind the environmental conservation benefit related to cost for maintenance

**(4) Details of Economic Benefit Associated with Environmental Conservation Activities, and Calculation Standards**

- 1) The range of calculation of the actual benefit, the formula, and the reasoning behind it
- 2) Period in which the investment benefit used in calculating the economic benefit associated with environmental conservation activities is manifest, and the grounds for its selection
- 3) In particular, in cases in which the calculation results for estimated benefit are disclosed, make note of this providing the details, range of calculation, calculation formula, and reasoning
- 4) In particular, in cases in which the evaluation of the economic value of the environmental conservation benefit is disclosed, make note of this providing the details, the reasons that it this value is not connected directly to the profits of the company or other organization, scope of calculation, the basic calculation method for converting each major environmental conservation benefit to monetary value, and the grounds for its selection

**(5) Aggregation Standards for Consolidated Environmental Accounting**

- 1) The elimination scope of internal transactions conducted within the business group, and the main details
- 2) Treatment of the equity ratio in aggregation
- 3) If there any discrepancies between the preparation of consolidated environmental accounting data by the company or other organization with that of related companies, provide the main details

**(6) Revision to Significant Environmental Accounting Policies**

If a change is made to the significant environmental accounting policies, the status, reason and impact of the change should be stated (explained quantitatively as best as possible).

## 7.3 Aggregated Results of Environmental Accounting

The environmental accounting aggregation results are to be provided. [Explanation 65]

### (1) Environmental Conservation Cost

This shows the aggregated results summing up the environmental conservation cost from categories corresponding to business activities and the details of the key activities.

### (2) Environmental Conservation Benefit

This shows the aggregated results summing up the volume of environmental impact according to environmental performance indicators and the environmental conservation benefit.

### (3) Economic Benefit Associated with Environmental Conservation Activities

This shows the aggregated results summing up the actual benefit and other economic benefit.

### (4) Schedules of Environmental Statements

This shows information necessary to supporting the data for environmental conservation cost, environmental conservation benefit, and the economic benefit associated with environmental conservation activities.

For example, the following information is effective as support:

- Aggregation based on categories corresponding to environmental conservation cost characteristics, such as environmental conservation activity areas;
- Sampling limited to those costs and benefits related to environmental performance indicators;
- Environmental conservation benefit corresponding to cost with the characteristics of cost for maintenance;
- Trends in capsule information related to environmental accounting;
- Trends in indicators for analysis of the environmental conservation activities.

#### **[Explanation 65] Correlation with Other Environmental Report Elements**

To promote further understanding of environmental accounting, the page of correlating topics found in the environmental report should be stated.

In addition, if guidelines other than these guidelines were used, it should be specified.

# 8. Application in Internal Management

## 8.1 Relationship between Disclosed Information and Internal Management Information

The guidelines represent a summary of the basic thinking behind environmental accounting in Japan. This aims toward a comprehensive environmental accounting methodology covering both external data publication and internal application.

The environmental management activities of companies and other organizations proceed by establishing a policy for environmental consideration in business activities overall, setting concrete environmental policy goals, creating an environmental activity plan for achieving environmental goals, and executing, evaluating, and revising environmental conservation activities based upon that plan. While these environmental management activities are executed by the entire organization as a whole, each of the management units is more closely departmentalized so as to improve the effectiveness of these activities. Therefore, each type of internal management information is accumulated in the prescribed management unit.

Environmental accounting must function to provide joint quantitative data on environmental conservation activities covering not only disclosure but also internal management within this flow of environmental management activities. [Explanation 66] [Explanation 67]

### (1) Arrangement of Data for Use in Disclosure

The environmental accounting data that is published externally is drawn from the same sources as that ascertained in detail for internal management purposes. Specific information drawn from that body of information is summarized and adjusted for external publication.

### (2) Application in Internal Management

The management units of a company or other organization operate according to factory, department, product line, etc., depending on their management objectives. It is important to define clearly the data necessary to these management objectives at the initial planning stage, so that the environmental accounting information is applicable to internal management.

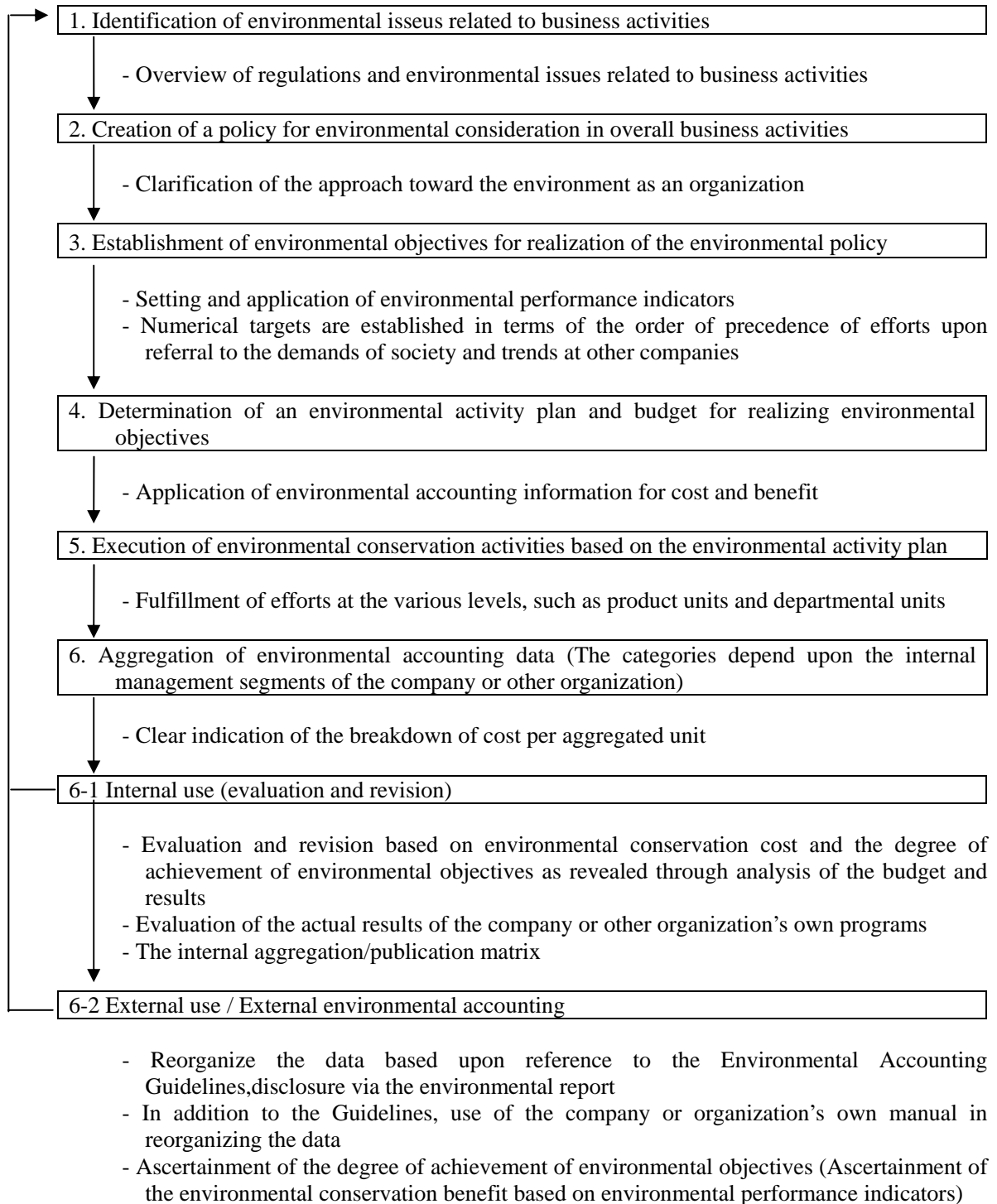
**[Explanation 66] Link to Management Information**

The environmental accounting information is closely connected to other management data, such as financial, personnel, and facility information. Therefore, companies and other organizations may contrive to effectively combine environmental accounting information with other management to implement multifaceted revisions of their environmental conservation activities.

Also, the publication of some of this management information can also be helpful in leading to a proper evaluation of the company or other organization by external parties.

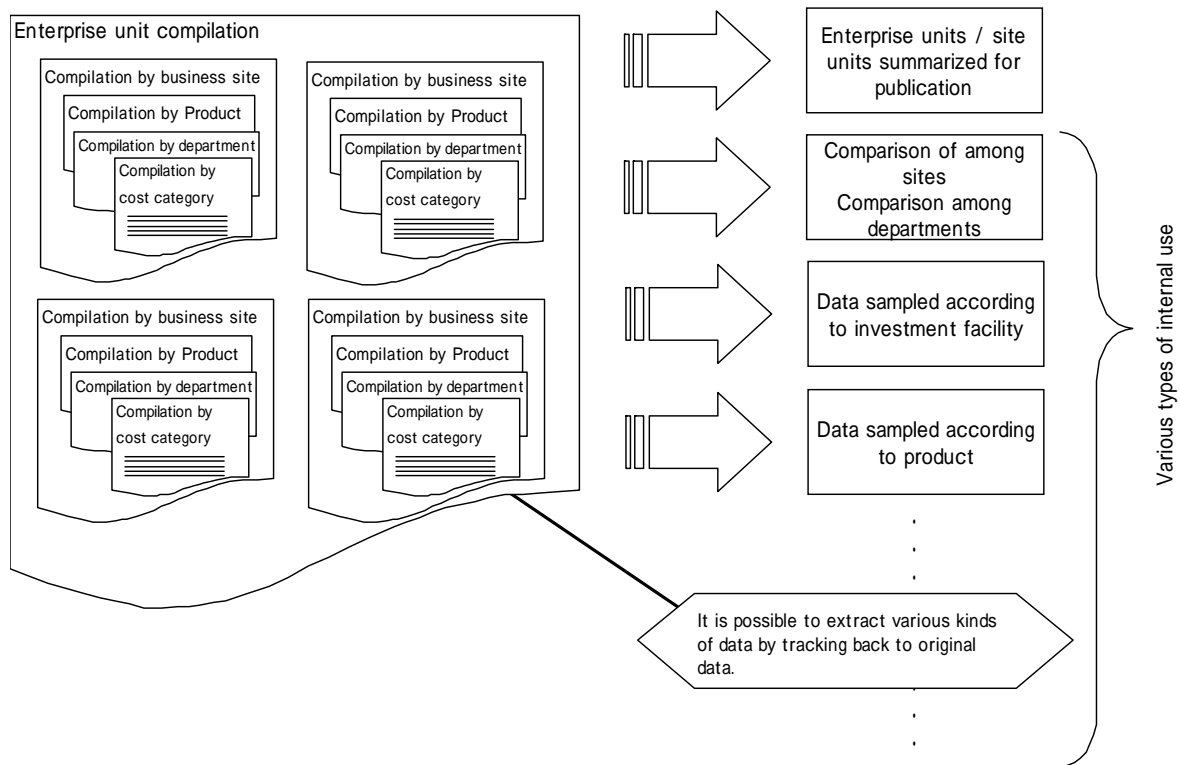
### [Explanation 67] Diagram of Application of Environmental Accounting Data

The environmental management activities of companies and other organizations proceed along the following management units. Of the data accumulated during this process, the data for environmental conservation costs and environmental conservation benefits are adjusted as environmental accounting data, and may be of use in disclosure and internal management.





## Overall View of Environmental Accounting Data



## 8.2 Development of Tools Focusing on Internal Management

The environmental accounting information in internal management is used particularly in the area generally referred to as environmental management accounting. In addition to the Guidelines, there already exists research into various environmental management accounting methods, such as those for introducing new thinking into cost control for individual products, contributing to the decision making process concerning facility investment, and developing innovations in process control and budget management. It is important for companies and other organizations to proceed with efforts corresponding to their actual situations by using the products of this research.

### Various methods according to application

<i>Target area</i>	<i>Methods</i>		
By product	Cost planning system that takes the environment into consideration	Environmental cost matrix method	Business results evaluation system that takes the environment into consideration
	Lifecycle costing		
Facility investment	Facility investment decision-making methodology		
Production and distribution processes	Material flow cost accounting		

Source: Ministry of Economy, Trade, and Industry “Environmental Management Accounting Methodology Workbook” (June 2002)

## 9. Indicators for Analysis Using Environmental Accounting Data

### 9.1 Meaning and Role of Indicators for Analysis

The meaning of the aggregated results can be indicated from various perspectives through the use of indicators for analysis of the environmental conservation activities, which combine the various environmental accounting aggregation categories and the business activity indicators. Also, period comparison of these indicators makes it easy to check the progress of the company or other organization's environmental conservation activities. Furthermore, these indicators may be used in internal management as targets for environmental conservation efforts.

### 9.2 Concept and Content of Indicators for Analysis

The indicators for analysis using environmental accounting data are as follows:

#### (1) Indicator for Analysis of Proportion of Total Scale of Business Activities Consisting of Environmental Conservation Activities

It is necessary to evaluate the relative magnitude of environmental conservation cost in comparison with the scale of business, in addition to the absolute cost. This indicator is provided through the following formula:

**Environmental conservation cost / Overall cost including environmental conservation cost**

( Actual example )

Cost of R&D for environmental conservation / Overall R&D cost

Sales of products that take the environment into consideration / Total operating revenues

#### (2) Indicator for Analysis of Effectiveness of Environmental Conservation Benefit vs. Environmental Conservation Cost

The effectiveness of the environmental conservation benefit as reflected in the degree to which the desired benefit has been gained through the input of environmental conservation cost is very important. This indicator is provided through the following formula:

**Environmental conservation benefit / Environmental conservation cost**

( Actual example )

Degree of energy productivity<sup>7</sup> improvement / Environmental conservation cost made for that purpose

Water usage productivity<sup>8</sup> improvement / Environmental conservation cost made for that purpose

**Recycling usage rate<sup>9</sup> improvement / Environmental conservation cost made for that purpose**

<sup>7</sup> Energy productivity = Added value / Total energy input volume

<sup>8</sup> Water usage productivity = Added value / Total energy input volume

<sup>9</sup> Recycling usage rate = Volume of recycled material used / (Volume of recycled material used + Total natural resource input volume)

### **(3) Indicators for Analysis of Relationship Between Business Activity Volume and Environmental Impact Volume**

While the environmental conservation benefit is basically ascertained according to the difference in the total volume of environmental impact, it is also vital to pursue business growth potential. Evaluation analysis of the relationship with business activity volume is effective in achieving the dual goals of environmental consideration and economic growth.

#### **a. Environmental Impact Volume per Unit of Business Activity Volume**

This is the environmental impact volume per unit of business activity volume, and is referred to as environmental impact intensity. This indicator is provided through the following formula:

##### **Environmental impact volume / Business activity volume**

( Actual examples )

Greenhouse gas emissions volume / Added value

Waste emissions volume / Added value

Emissions volume of chemicals subject to prescribed control / Sales of certain products

#### **b. Business Activity Volume per Unit of Environmental Impact Volume**

This is business activity volume per unit of environmental impact volume, and is referred to as environmental efficiency. This indicator is provided through the following formula:

##### **Business activity volume / Environmental impact volume**

( Actual examples )

Added value / Total energy input volume

Added value / Total water input volume

Sales of certain products / Input volume of chemicals subject to prescribed controls

## 10. Environmental Accounting Disclosure Format and Internal Management Tables

### 10.1 Disclosure Format for External Publication

The Guidelines recommend common formats for disclosure of the environmental accounting aggregation results as given in the following examples, with the goal of promoting uniform understanding throughout society as a whole. [Explanation 68]

It is not necessary for companies and other organizations to publish at the outset all environmental conservation cost, environmental conservation benefit, or economic benefit associated with environmental conservation activities. Depending upon the current duration and goals of the efforts being made by the company or other organization, it is acceptable to begin by publishing only the environmental conservation costs, and to proceed in stages thereafter.

Even in such cases, it is important to maintain consistency with the main statements and those for auxiliary details, and to proceed with efforts to engage in the publication of external data.

#### **Environmental Accounting Aggregation Results (Format for Publication)**

< Main Statements >

- 1) Environmental Conservation Cost (Categories Corresponding to Business Activities)
- 2) Environmental Conservation Benefit
- 3) Economic Benefit Associated With Environmental Conservation Activities

< Schedules of Environmental Statements >

- 1) Environmental Conservation Cost (Categories Corresponding to Areas of Application of Environmental Conservation Measures)
- 2) Cost vs. Benefit Comparison for Main Environmental Performance Indicators
- 3) Environmental Conservation Benefit Related to Costs for Maintenance
- 4) Trend Chart for Summary Environmental Accounting Data for the Three Most Recent Periods
- 5) Trend Chart for Indicators Used for Analysis for the Three Most Recent Periods

#### **[Explanation 68] Disclosure Format That Conforms to the Actual Situation**

Companies and other organizations may use the disclosure format recommended in the Guidelines as a reference in adopting their own disclosure format that most appropriately expresses the individual data of the company or other organization. In such instances, the content of that format, the calculation methods, and the relationship with other published data is to be noted so as to provide proper understanding of the format adopted.

**Main Statement 1) Environmental Conservation Cost (Categories Corresponding to Business Activities)**

Scope: ( )  
 Target Period: ~  
 Unit: ¥

Environmental Conservation Cost - Categories Corresponding to Business Activities -				
Category		Key Activity and the Outcome	Investment	Cost
(1) Business Area Cost				
Breakdown	(1)-1 Pollution Prevention Cost			
	(1)-2 Global Environmental Conservation			
	(1)-3 Resource Circulation Cost			
(2) Upstream/Downstream Cost				
(3) Administration Cost				
(4) R&D Cost				
(5) Social Activity Cost				
(6) Environmental Remediation Cost				
Total				

- In the case of costs that are not applicable to any of the above categories and are entered in (7) “Other cost”, disclose the content in “Important Basic Environmental Accounting Categories”.



**Main Statement 3) Economic Benefit Associated with Environmental Conservation Activities**

Scope: ( )  
 Target Period: ~  
 Unit: ¥

Economic Benefit Associated with Environmental Conservation Activities ( Actual Benefits )		
Details of Benefit		Amount
Revenue	Operating revenue from the sale of recycled waste products and used products produced through key business activities	
	...	
Cost Reduction	Reductions in energy costs through energy conservation	
	Reductions in waste disposal costs through resource	
	...	
Total		

- Please note the details of the actual benefit correspondent to the actual situation at the company or other organization.
- When disclosing estimated benefit, the premises and reasoning behind the calculation method selected should be made clear, so as not to cause misunderstandings amongst stakeholders.

**Schedules of Environmental Statement 1) Environmental Conservation Cost (Categories Corresponding to Areas of Application of Environmental Conservation Measures)**

Scope: ( )  
 Target Period: ~  
 Unit: ¥

Environmental Conservation Costs - Categories Corresponding to Areas of Application of Environmental Conservation Measures -			
Categories	Details of measures	Investment	Cost
1) Cost related to global warming measures			
2) Cost related to ozone layer protection measures			
3) Cost related to air quality conservation measures			
4) Cost related to noise and vibration			
5) Cost related to environmental conservation measures for the aquatic, ground, and geologic environments			
6) Cost related to waste product and recycling measures			
7) Cost related to measures for reducing chemical risk and emissions			
8) Cost related to natural environmental conservation			
9) Other costs			
Total			

- The selection of the main areas of environmental conservation activities is to made based on correspondence to the actual situation at the company or other organization.
- This table is merely a basic representation of Main Statement 1). When the actual range of environmental conservation cost differs, please note the details. [Explanation 34]



**Schedules of Environmental Statement 2) Cost vs. Benefit Comparison for Main Environmental Performance Indicators**

**Volume of Greenhouse Gas Emissions**

Previous period (base period):	Current period:	Environmental conservation benefits:
Target year:	Target figure:	Degree of attainment:
Details of environmental conservation activities		Environmental conservation costs:
Total		
Other environmental conservation benefits concerning measures to prevent global warming		
(Appropriate notes)		
(Example) Fluctuation analysis of environmental performance indicators		

**Total Waste Emissions Volume**

Previous period (base period):	Current period:	Environmental conservation benefits:
Target year:	Target figure:	Degree of attainment:
Details of environmental conservation activities		Environmental conservation costs:
Total		
Other environmental conservation benefits concerning waste or recycling activities		
(Appropriate notes)		
(Example) Fluctuation analysis of environmental performance indicators		

**Volume of Specially Designated Chemicals Transferred or Emitted**

Previous period (base period):	Current period:	Environmental conservation benefits:
Target year:	Target figure:	Degree of attainment:
Designated chemicals		
Details of environmental conservation activities		Environmental conservation costs:
Total		
Other environmental conservation benefits concerning chemical handling measures		
(Appropriate notes)		
(Example) Fluctuation analysis of environmental performance indicators		

- This table contains categories extracted from Main Statements 1) and 2) so as to provide a more thorough explanation of items in which stakeholders have a strong interest.



**Schedules of Environmental Statement 5) Trend Chart for Indicators Used for Analysis for the Three Most Recent Periods**

	The Period before previous	Previous period	Current period
Proportion of the total scale of business activities consisting of environmental conservation activities			
Proportion of total R&D cost consisting of R&D costs for environmental conservation goals			
Proportion of total investment amount consisting of investment for environmental conservation goals			
Proportion of total operating revenue consisting of sales of products that take the environment into consideration			
Efficiency of environmental cost and benefit in specific areas			
Energy productivity			
Degree of energy productivity improvement / Environmental conservation costs			
Water usage productivity			
Water usage productivity improvement / Environmental conservation costs			
Recycling usage rate			
Recycling usage rate improvement / Environmental conservation costs			

- Energy productivity = Added value / Total energy input volume
- Water usage productivity = Added value / Total energy input volume
- Recycling usage rate = Volume of recycled material used / ( Volume of recycled material used + Total natural resource input volume )

**10.2 Management Tables for Internal Use**

The following examples of management tables for internal use (“internal management tables”) are provided so as to encourage the use of environmental conservation cost in internal aggregation and management at companies and other organizations. Please employ these where appropriate.

In using these internal management tables, please establish clear account headings, environmental performance indicators, and the business sites, organizations, etc., that are subject to management, based upon an examination of the actual situation at the company or other organization and of what types of organizations are to be subject.

When such internal management tables are actually used, the roles of each organization functioning as a management unit (department, business site, related company, etc.) are to be composed according to the management unit period (monthly, quarterly, semi-annually, annually, etc.) in the making of the tables. The role of the managing department executing overall control is to aggregate all of the internal management tables for each management unit.

**(1) Environmental Conservation Cost**  
**A) Example: Per Business Activity**

	Details of Investment/ Details of Measures	Investment				Total Investment	Cost								Total Cost
		Tangible Fixed Assets		Intangible Assets			Main Cost of Materials		Personnel Expenses		Expenses		Other		
		Machinery and Equipment	...	Software	...		Cost of Materials	...	Salary	...	Depreciation Cost	...	...	...	
<b>(1) Business Area Cost</b>															
<b>(1)-1 Pollution Prevention Cost</b>															
	① Cost for preventing air pollution (including acid rain)														
	② Cost for preventing water pollution														
	③ Cost for preventing ground contamination														
	④ Cost for preventing noise pollution														
	⑤ Cost for preventing vibration pollution														
	⑥ Cost for preventing odor pollution														
	⑦ Cost for preventing ground sinkage														
	⑧ Cost for preventing other types of pollution														
<b>(1)-2 Global Environmental Conservation Cost</b>															
	① Cost for preventing global warming and energy conservation														
	② Cost for preventing the ozone depletion														
	③ Cost for other global environmental conservation activities														
<b>(1)-3 Resource Circulation Cost</b>															
	① Cost for the efficient utilization of resources														
	② Cost for recycling industrial waste														
	③ Cost for recycling municipal waste														
	④ Cost for disposal of industrial waste														
	⑤ Cost for disposal of municipal waste														
	⑥ Cost contributing to resource circulation														
<b>(2) Upstream / Downstream Costs</b>															
	① The difference in cost between goods and services procurement and purchasing methods that contribute to reduction of environmental impact and typical goods and services procurement and purchasing methods														
	② Additional cost for supplying environmentally conscious products														
	③ Additional cost for reducing the environmental impact of containers and packaging														
	④ Cost for the collection, recycling, resale and proper disposal of used products														
	⑤ Other upstream and downstream costs														
<b>(3) Administration Cost</b>															
	① Cost for the implementation and maintenance of an environmental management system														
	② Cost for disclosure of environmental information associated with business activities and environmental advertising														
	③ Cost for monitoring environmental impact														
	④ Cost for environmental training of employees														
	⑤ Cost for environmental improvement activities, such as nature conservation, greening, beautification, and landscape preservation, at or in the vicinity of the business site														
<b>(4) R&amp;D Cost</b>															
	① R&D cost to develop products that contribute to environmental conservation														
	② R&D cost to curtail environmental impact at the product manufacturing stage														
	③ Other R&D cost associated to the curtailment of environmental impact at the distribution stage or the marketing stage of products														
<b>(5) Social Activity Cost</b>															
	① Cost for environmental improvement activities, including nature conservation, planting of greenery, beautification and landscape preservation, with the exception of the business site														
	② Cost related to donation or financial support of environmental groups														
	③ Cost associated with various social activities, such as the financial support of a local community's environmental conservation activities and the disclosure of information to the local community														
<b>(6) Environmental Remediation Cost</b>															
	① Cost to restore the natural environment back to its original state														
	② Cost to cover degradation suits connected with environmental conservation														
	③ Provisions or insurance fees to cover degradation to the environment														
<b>Total</b>															

**B) Example: Per Area of Environmental Conservation Activity**

	Details of Investment/ Details of Measures	Investment					Cost								
		Tangible Fixed Assets		Intangible Assets		Total Investment	Main Cost of Materials		Personnel Expenses		Expenses		Other		Total Cost
		Machinery and Equipment	...	Software	...		Cost of Materials	...	Salary	...	Depreciation Cost	...	...	...	
1) Cost related to global warming measures															
2) Cost related to ozone layer protection measures															
3) Cost related to air quality conservation measures															
4) Cost related to noise and vibration measures															
5) Cost related to environmental conservation measures for the aquatic, ground, and geologic environments															
6) Cost related to waste product and recycling measures															
7) Cost related to measures for reducing chemical risk and emissions															
8) Cost related to natural environmental conservation															
9) Other costs															
Total															

**(2) Environmental Conservation Benefit**  
**Example of the Environmental Impact**

Environmental Conservation Benefit Categories	Environmental Performance Indicators			Actual Figures
Environmental Conservation Benefit Related to Resources Input into Business Activities	Total Energy			
	Input Volume	Energy Input Volume by Type	Purchased electricity	
			Oil	
			Natural gas	
			Liquefied petroleum gas (LPG)	
			Coal	
			New energy	
			...	
	Input Volume of Specially Controlled Substances		Input volume of circulated resources	
	...			
	Input Volume of Water	Input Volume of Water by Source	Water supply	
			Water for industrial use	
			Underground water	
			Seawater	
			Riverwater	
Rainwater				
...				
Environmental Conservation Benefit Related to Waste or Environmental Impact Originating from Business Activities	Volume of Greenhouse Gas Emissions			
	Volume of Greenhouse Gas Emissions	Volume of Greenhouse Gas Emissions by Type or by Emissions Activity	Carbon dioxide (CO <sub>2</sub> )	
			methane (CH <sub>4</sub> )	
			Dinitrogen oxide (N <sub>2</sub> O)	
			HFC	
			PFC	
			SF <sub>6</sub>	
			...	
	Volume of Specially Designated Chemicals Transferred or Emitted		...	
	Total Waste Emission Volume		Final waste disposal volume	
	Wastewater Volume		BOD (biochemical oxygen demand)	
			COD (chemical oxygen demand)	
	Other		NO <sub>x</sub> emission volume	
			Sox emission volume	
		Odor		
		...		

**(3) Economic Benefit Associated with Environmental Conservation Activities**

A. Examples of Revenue

Detail	Volume	Value	Revenue		
			Sales Volume	Other Income	Extraordinary profit
Revenue from the sale of recycled products and of unusable products produced through key business activities.					
...					
Total					

B. Examples of Cost Saving

Detail	Volume	Value	Cost						
			Main Cost of Materials		Personnel Expenses		Expenses		Other
			Cost of Materials	...	Salary	...	Depreciation Cost	...	...
Energy expense saving through energy conservation									
Disposal cost saving through lower resource input or recycling									
...									
Total									

**(4) Management Table**  
**A. Examples of Management Tables by Business Site**

	A Site	B Site	...	Whole Company	F Subsidiary	...	Whole Group
(1) Business Area Cost							
(1)-1 Pollution Prevention Cost							
① Cost for preventing air pollution (including acid rain)							
② Cost for preventing water pollution							
③ Cost for preventing ground contamination							
④ Cost for preventing noise pollution							
⑤ Cost for preventing vibration pollution							
⑥ Cost for preventing odor pollution							
⑦ Cost for preventing ground sinkage							
⑧ Cost for preventing other types of pollution							
(1)-2 Global Environmental Conservation Cost							
① Cost for preventing global warming and energy conservation							
② Cost for preventing the ozone depletion							
③ Cost for other global environmental conservation activities							
(1)-3 Resource Circulation Cost							
① Cost for the efficient utilization of resources							
② Cost for recycling industrial waste							
③ Cost for recycling municipal waste							
④ Cost for disposal of industrial waste							
⑤ Cost for disposal of municipal waste							
⑥ Cost contributing to resource circulation							
(2) Upstream / Downstream Costs							
① The difference in cost between goods and services procurement and purchasing methods that contribute to reduction of environmental impact and typical goods and services procurement and purchasing methods							
② Additional cost for supplying environmentally conscious products							
③ Additional cost for reducing the environmental impact of containers and packaging							
④ Cost for the collection, recycling, resale and proper disposal of used products							
⑤ Other upstream and downstream costs							
(3) Administration Cost							
① Cost for the implementation and maintenance of an environmental management system							
② Cost for disclosure of environmental information associated with business activities and environmental advertising							
③ Cost for monitoring environmental impact							
④ Cost for environmental training of employees							
⑤ Cost for environmental improvement activities, such as nature conservation, greening, beautification, and landscape preservation, at or in the vicinity of the business site							
(4) R&D Cost							
① R&D cost to develop products that contribute to environmental conservation							
② R&D cost to curtail environmental impact at the product manufacturing stage							
③ Other R&D cost associated to the curtailment of environmental impact at the distribution stage or the marketing stage of products							
(5) Social Activity Cost							
① Cost for environmental improvement activities, including nature conservation, planting of greenery, beautification and landscape preservation, with the exception of the business site							
② Cost related to donation or financial support of environmental groups							
③ Cost associated with various social activities, such as the financial support of a local community's environmental conservation activities and the disclosure of information to the local community							
(6) Environmental Remediation Cost							
① Cost to restore the natural environment back to its original state							
② Cost to cover degradation suits connected with environmental conservation							
③ Provisions or insurance fees to cover degradation to the environment							
Total							

- This may be used in the same way for environmental conservation cost or environmental conservation benefit per area of environmental conservation activity



## B. Examples of Monthly Management Table

	April	May	June	• • •	February	March	Total
(1) Business Area Cost							
(1)-1 Pollution Prevention Cost							
① Cost for preventing air pollution (including acid rain)							
② Cost for preventing water pollution							
③ Cost for preventing ground contamination							
④ Cost for preventing noise pollution							
⑤ Cost for preventing vibration pollution							
⑥ Cost for preventing odor pollution							
⑦ Cost for preventing ground sinkage							
⑧ Cost for preventing other types of pollution							
(1)-2 Global Environmental Conservation Cost							
① Cost for preventing global warming and energy conservation							
② Cost for preventing the ozone depletion							
③ Cost for other global environmental conservation activities							
(1)-3 Resource Circulation Cost							
① Cost for the efficient utilization of resources							
② Cost for recycling industrial waste							
③ Cost for recycling municipal waste							
④ Cost for disposal of industrial waste							
⑤ Cost for disposal of municipal waste							
⑥ Cost contributing to resource circulation							
(2) Upstream / Downstream Costs							
① The difference in cost between goods and services procurement and purchasing methods that contribute to reduction of environmental impact and typical goods and services procurement and purchasing methods							
② Additional cost for supplying environmentally conscious products							
③ Additional cost for reducing the environmental impact of containers and packaging							
④ Cost for the collection, recycling, resale and proper disposal of used products							
⑤ Other upstream and downstream costs							
(3) Administration Cost							
① Cost for the implementation and maintenance of an environmental management system							
② Cost for disclosure of environmental information associated with business activities and environmental advertising							
③ Cost for monitoring environmental impact							
④ Cost for environmental training of employees							
⑤ Cost for environmental improvement activities, such as nature conservation, greening, beautification, and landscape preservation, at or in the vicinity of the business site							
(4) R&D Cost							
① R&D cost to develop products that contribute to environmental conservation							
② R&D cost to curtail environmental impact at the product manufacturing stage							
③ Other R&D cost associated to the curtailment of environmental impact at the distribution stage or the marketing stage of products							
(5) Social Activity Cost							
① Cost for environmental improvement activities, including nature conservation, planting of greenery, beautification and landscape preservation, with the exception of the business site							
② Cost related to donation or financial support of environmental groups							
③ Cost associated with various social activities, such as the financial support of a local community's environmental conservation activities and the disclosure of information to the local community							
(6) Environmental Remediation Cost							
① Cost to restore the natural environment back to its original state							
② Cost to cover degradation suits connected with environmental conservation							
③ Provisions or insurance fees to cover degradation to the environment							
Total							

- This may be used in the same way for environmental conservation cost or environmental conservation benefit per area of environmental conservation activity

### 10.3 Various Reference Tables for Application in Environmental Accounting

Reference tables are provided as references for more detailed assessment, analysis, and evaluation of environmental accounting data. These reference tables are effective for use in internal management as well, and they also may be employed in the publication of detailed information.

#### (1) Example of Reference Table Corresponding to Areas of Environmental Conservation Activity and Environmental Conservation Activity Planning Systems

By comparing environmental conservation cost with the areas of environmental conservation activities and the details of efforts shown in environmental conservation activity plans, it becomes easier to evaluate the benefit vs. the environmental conservation cost.

Categories Corresponding to Business Activities	Categories Corresponding to Areas of Application of Environmental Conservation Measures																					
	Cost related to global warming measures			Cost related to ozone layer protection measures			Cost related to air quality conservation measures			Cost related to noise and vibration measures		Cost related to environmental conservation measures for the aquatic, ground, and geologic environments			Cost related to waste product and recycling measures		Cost related to measures for reducing chemical risk and emissions		Cost related to natural environmental conservation		Other costs	
	Reduction of CO2 emissions	...	...	Reduction of Freon emissions	...	...	Reduction of NOX emissions	Reduction of SOX emissions	...	...	...	Improvement of water quality	Measures of ground contamination	...	...	...	...	...	...	...	...	
(1) Business Area Cost																						
(2) Upstream/Downstream Cost																						
(3) Administration Cost																						
(4) R&D Cost																						
(5) Social Activity Cost																						
(6) Environmental Remediation Cost																						
Total																						
Environmental Conservation Benefits																						
Environmental Effect (amount of environmental impact)																						

- This chart shows the matrix combining the categories of environmental conservation cost corresponding to business activities and areas of environmental conservation activity. This is effective in ascertaining the environmental conservation benefit in conjunction with the environmental impact (amount of environmental impact).

Category of Environmental Conservation Activity Planning Systems	Associated Cost and Benefit	Environmental Conservation Cost		Environmental Conservation Benefit		
		Investment	Cost	Target	Result	Evaluation of Attainment
Items Concerning to Management of Whole Organization						
Items Concerning to Operation						
Items Concerning to Goods and Services						
Other Items						
Total						

- This is a table for use in managing environmental conservation cost and environmental conservation benefit through environmental conservation activity planning systems.

## (2) Example of Reference Table Concerning Environmental Assets, etc.

This example of a reference table for environmental investment in facility investment is taken from the Ministry of the Environment of the Republic of South Korea's Environmental Accounting Guidelines.

	Pollution Prevention or Treatment Facilities	R&D	Total Investment	Investment in Environmental Assets			
				Assets at the Beginning	Investment at Current Period	Depreciation	Assets at the End
1. Air Pollution							
2. Water Pollution							
3. Waste							
4. Ground Contamination							
5. Resource Conservation							
6. Noise · Odor etc.							
7. Other							
Total							

Source : Ministry of the Environment of the Republic of South Korea, "Environmental Accounting Systems and Environmental Performance Indicators" (2001)

Corporate value is also thought to be improved through the excess earning power gained through advanced environmental efforts. There is research being conducted into the recognition of this as asset capitalization in the form of brand value.

In addition, liabilities under financial accounting that refer to environmental problems, such as reserves for contaminated ground cleanup, are considered by some to be environmental liabilities. As a separate issue, the accumulation of environmental impact amount in each business year (flow) is considered by some to comprise latent environmental liability (stock).

### **(3) Example of Reference Table Concerning Environmental Externalities**

The following reference table from the British SIGMA Project<sup>10</sup> Environmental Accounting Guidelines<sup>11</sup> is an example of an attempt through environmental flow chart research to grasp the extent to which the efforts made by a company or other organization contribute to the realization of a sustainable society. [Explanation 69]

#### **[Explanation 69] Environmental Externalities**

In instances in which the economic activities of one party result in a direct positive or negative economic impact upon another outside party that has not transpired through engagement in market transactions (and is not reflected in market prices), the resulting effect is referred to as an externality or external effect.

Generally speaking, environmental externalities refer to cases of inappropriate or excessive use of environmental capacity or carrying capacity, destruction of precious natural resources, dangers of resource depletion, or other cases involving environmental impact.

<sup>10</sup> SIGMA Project : The SIGMA ( Sustainability Integrated Guidelines for Management) Project  
The SIGMA Project was launched in 1999 with the support of the UK Department of Trade and Industry. It is a partnership between the British Standards Institution, the Forum for the Future, and others.

<sup>11</sup> The Environmental Accounting Guidelines: This is a portion of the SIGMA Guidelines. It was published in September 2003 with the goal of providing a definition of environmental accounting and to list aggregation methods for “environmentally sustainable profit”. The SIGMA Guidelines also currently provides unified environmental accounting guidelines consolidating the economic, social, and environmental aspects. In the Guidelines, the term “sustainability gap” refers to the difference between “present emissions” and the “sustainability target”.

## Environmental Accounting Statement

Emissions/Impacts	Emissions ( Tonnes)	Difference between Reduction Target(Tonnes), Sustainability Gap = A	Unit Avoidance or Restoration Cost = B	Total Avoidance or Restoration Cost C = A x B
<b>IMPACTS TO AIR</b>				
<i>Direct Energy</i>				
...	×	A	B	
...	×	A	B	
...	×	A	B	
...	×	A	B	
Total				C
<i>Production Related Emissions</i>				
	×	A	B	
	×	A	B	C
<i>Transport</i>				
...	×	A	B	
...	×	A	B	
...	×	A	B	
...	×	A	B	
Total				C
<b>IMPACTS TO LAND</b>				
...		×		×
<b>IMPACTS TO WATER</b>				
...		×		×
<b>Total Sustainability Cost</b>				×
<b>Profit after Tax per the Financial Accounts</b>				×
<b>Environmentally Sustainable /Adjusted Profit</b>				×

Source: The SIGMA Project “THE GUIDELINES-TOOLKIT (SIGMA ENVIRONMENTAL ACCOUNTING GUIDE)” ( 2003 )

\* Appropriate items should be set for. “Emissions / Impacts”.

\* “Environmentally Sustainable / Adjusted Profit” = “Profit after Tax per the Financial Accounts”  
- “Total Sustainability Cost”

#### (4) Example of a reference table concerning non-product output

The environmental conservation costs in the Guidelines target the resource and energy invested in non-product output discarded without ending up in the final product. This is useful in the reduction of such non-product output. The environmental accounting includes material flow cost accounting procedures and UNDS (United Nations Division for Sustainable Development ) procedures.[Explanation 70]

### Environmental Expenditure/Cost and Revenue/Earning

Environmental Media Environmental Cost /Expenditure Categories	Wastewater	Waste	Ground/ Groundwater	Noise/ Vibration	Biodiversity/ Landscape	Radiation	Other	Total
1. Waste and Emission Treatment								
1.1. Depreciation for Related Equipment								
...								
2. Prevention and Environmental Management								
...								
3. Material Purchase Value of Non-Product Output								
3.1. Raw Materials								
3.2. Packaging								
3.3. Auxiliary Materials								
3.4. Operating Materials								
3.5. Energy								
3.6. Water								
4. Processing Costs of Non-Product Output								
Environmental Expenditure								
5. Environmental Revenues								
5.1. Subsidies, awards								
5.2. Other Earnings								
Environmental Revenues								

Source: UNDSO “Environmental Management Accounting Procedures and Principles” (2001 )

**[Explanation 70] Calculation of Non-product Output**

Calculating non-product output requires attention to the amount of materials input. It is possible to conceive of a method by which cost and energy input are distributed according to the ratio of the portion that ends up in final products versus that which does not.

(Procedure 1 ) The materials input volume is divided into product and non-product portions.

(Procedure 2) Materials cost is allocated according the volume ratio in Procedure 1.

(Procedure 3) The energy input cost may also be calculated according to Procedure 2, when the non-product portion has been ascertained.

	Materials input		Input of energy, etc.	Total
	Input volume (physical volume)	Cost (monetary amount)		
Total	: Materials input volum	A: Materials cost	D: Processing cost	Amount equivalent to product cost in financial accounting
Product portion	Materials input amount in product portion (Product manufacturing amount)	B: Amount equivalent to materials cost in product portion 【B = A x / 】	E: Amount equivalent to processing cost in product portion 【E = D x / 】	Cost for product portion only 【B + E】
Non-product portion	: Materials input volume for non-product portion (Difference between and ) 【 = - 】	C: Amount equivalent to materials cost amount for non-product portion 【C = A x / 】	F: Amount equivalent to processing cost for non-product portion 【F = D x / 】	Amount equivalent to cost for non-product portion 【C + F】