

“Supply-chain emissions” in Japan



Ministry of the Environment

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Introduction

Background

At present in Japan, as a measure against global warming, companies meeting certain criteria are accounting for and reporting their own greenhouse gas emissions, and national and regional government organizations are publicly disclosing their emissions data, in accordance with the Mandatory Greenhouse Gas Accounting and Reporting System (referred to below as the “Accounting and Reporting System”) based on the Act on Promotion of Global Warming Countermeasures (referred to below as the “Global Warming Countermeasures Act”) as well as various programs based on certain regional ordinances. In addition, many businesses are voluntarily disclosing data on their own emissions in reports on corporate social responsibility (CSR), and growing numbers of companies are taking steps to determine and reduce their own emissions. Meanwhile, the scope of emissions determined under the existing Accounting and Reporting System, CSR reporting, and the like is generally limited to the reporting company’s own emissions, and therefore, contributions made through energy-saving products and the spread of products with lower greenhouse gas emissions are not reflected when companies evaluate their own emissions.

The business activities of companies are linked through purchasing and sales in the supply chain ; and although there may be a great deal of potential for reducing emissions, the potential for such reduction is not clarified when companies determine only their own emissions, and there are no incentives for taking action to reduce emissions through supply chain management. Therefore, in the determination and management of emissions, it is important to determine not only the reporting company’s own emissions but also greenhouse gas emissions in the supply chain (referred to below as “supply chain emissions”).

The following are global initiatives for standardization and information disclosure with regard to accounting and reporting of companies’ supply chain emissions.

- Development of standards under the GHG Protocol¹
- Study of greenhouse gas accounting guidelines by ISO
- Growing demand for disclosure under the Carbon Disclosure Project (CDP), etc.

Under the GHG Protocol, the “Corporate Value Chain (Scope 3)² Accounting and Reporting Standard” (referred to below as the “Scope 3 Standard”) was developed to provide methods for the accounting and reporting of emissions in the value chain of a business. In 2008, a steering committee and technical working groups began studies toward the Scope 3 Standard. The process since then has included meetings with stakeholders to obtain feedback, road testing by over 60 companies, and public comments on draft versions. The completed Standard was published in October 2011.

The International Organization for Standardization (ISO) was developed ISO/TR 14069 (“Quantification and reporting of GHG emissions for organizations : Guidance for the application of ISO 14064-1”). This document, ISO/TR 14069, provide guidelines concerning methodology for organizations to quantify and

¹ GHG Protocol : A process to develop greenhouse gas accounting and reporting standards based on agreement by the participants, which include a U.S. environmental NGO called the World Resources Institute (WRI), a worldwide economic council called the World Business Council for Sustainable Development (WBCSD), and a variety of interested parties from around the world including companies, government institutions, NGOs, and academic institutions.

² Scope 3 : A concept related to the scope of emissions under the GHG Protocol. For details, see p. 3-4.

report their direct and indirect emissions, and was developed in alignment with the Scope 3 Standard.

A move to demand disclosure of Scope 3 emissions data is emerging, including the CDP³ and the Climate Change Reporting Framework (CCRF)⁴. Some reports concerning Scope 3 emissions have been issued by 220 companies in its “CDP Japan 500 Report 2014.”

These developments are part of a rising global trend toward the determination and management of companies’ supply chain emissions along with disclosure of related information. The need for such measures is expected to continue to grow in the future.



Purpose of this brochure

This brochure aims to provide a whole picture of Japan’s actions regarding supply-chain emissions accounting, including data collection and management.

The scope of supply chain emissions covers not only the emissions of the reporting company itself, but also all emissions related to business activities, including purchasing and sales by the company. Calculating and determining such emissions at each stage of the supply chain makes it possible to discover those stages of the supply chain that involve higher levels of emissions, as well as those areas that offer greater potential for reducing emissions ; and this allows companies to implement efficient measures for reducing emissions in the overall supply chain.

However, obtaining information on supply-chain emissions is not that simple, especially for Scope 3 data which covers a broad range including those that seem to be “extremely difficult to obtain.” On the other hand, in some cases, there are information available as required under other environmental regulations, which can be diverted for supply-chain emissions accounting and therefore save operators’ time and trouble.

In this context, this brochure illustrates ongoing practices of supply-chain emissions accounting in Japan. The contents include : introduction of leading activities by private sector, official supports by the Government, and correlation between environmental regulations and reporting boundaries of supply-chain emissions.

We hope this brochure will help you to understand Japan’s efforts on supply-chain emissions accounting, and that sharing our knowledge and experiences could contribute to expand such actions to reduce supply-chain emissions worldwide.

³ CDP : A project in which institutional investors from around the world send questionnaires concerning climate change to the world’s major corporations and then evaluate and publish their responses.

⁴ CCRF : An international framework for the disclosure of information related to climate change. The first version was issued in September 2010 by the Climate Disclosure Standards Board (CDSB).

What's "supply-chain emissions"?

Overview of supply-chain emissions

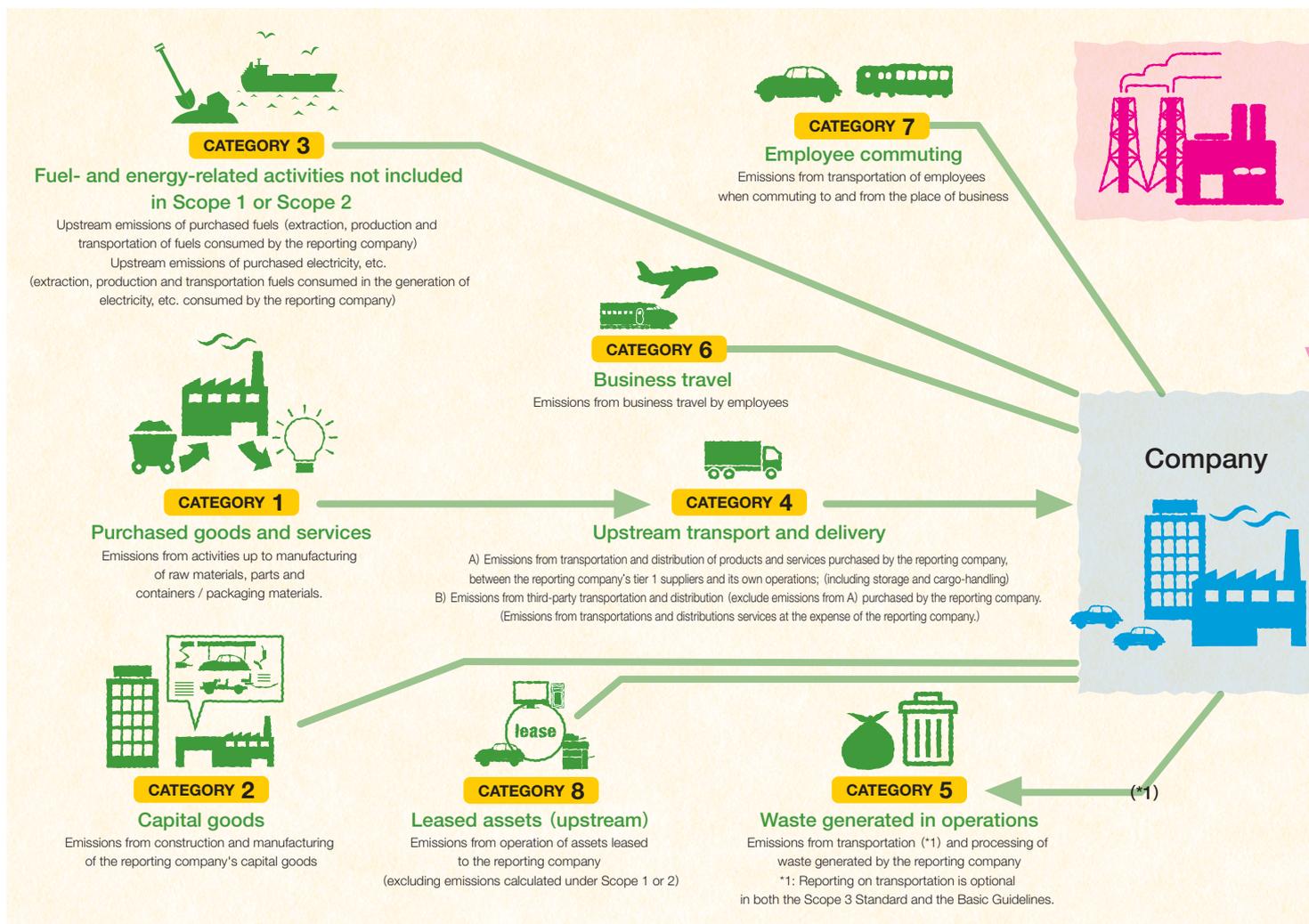
"Supply chain" is a flow of business operations in an industry with stages of raw-material procurement, manufacture, transport, sales and end-of-life treatment. GHG emissions sourced from the same supply chain are collectively called as "supply-chain emissions."

Supply-chain emissions are consisted with **Scope 1**, **Scope 2** and **Scope 3** emissions as shown below. Moreover, Scope 3 emissions are subdivided into 15 categories (Category 1 – Category 15).

GHG Protocol and Scope 3 Standard

The GHG Protocol is a non-governmental organization established by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). It developed the Scope 3 Standard as a tool to account for GHG emissions from a supply chain, which was published as the "Corporate Value Chain (Scope3) Accounting and Reporting Standard" in November 2011. Meanwhile, "Product Life Cycle Accounting and Reporting Standard" was also published as an accounting standard for product-related emissions. The Scope 3 Standard has been adopted by various entities such as rating companies and used for various researches and surveys worldwide.

Figure 1 Images of Scope 1, Scope 2 and Scope 3 emissions



What's "supply-chain emissions"?

The sum of supply chain emissions.

Total volume of Scope 1 and Scope 2 emissions from companies in the world should be equivalent to total emissions from business activities all over the world. On the other hand, total supply-chain emissions cannot be equivalent to total global emissions, because emissions from a single operation can be covered in accountings by different entities. The figure shows an example that an emission source is included in reporting boundaries of both Company A and Company B. It may sound strange; however, because of this characteristics, supply-chain emissions accounting allows us to evaluate emissions which are not covered in Scopes 1 or 2, such as raw material procurement, waste reduction, energy saving at use stage, etc.. Therefore, this evaluation scale provides companies a lot more potential for GHG emission reductions in a wider range of emission sources in an entire supply chain.

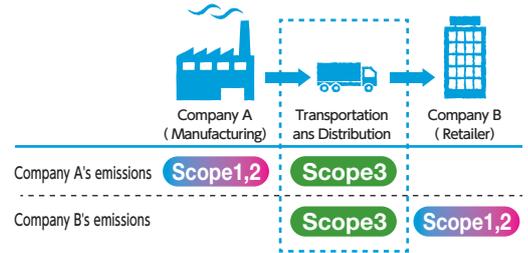


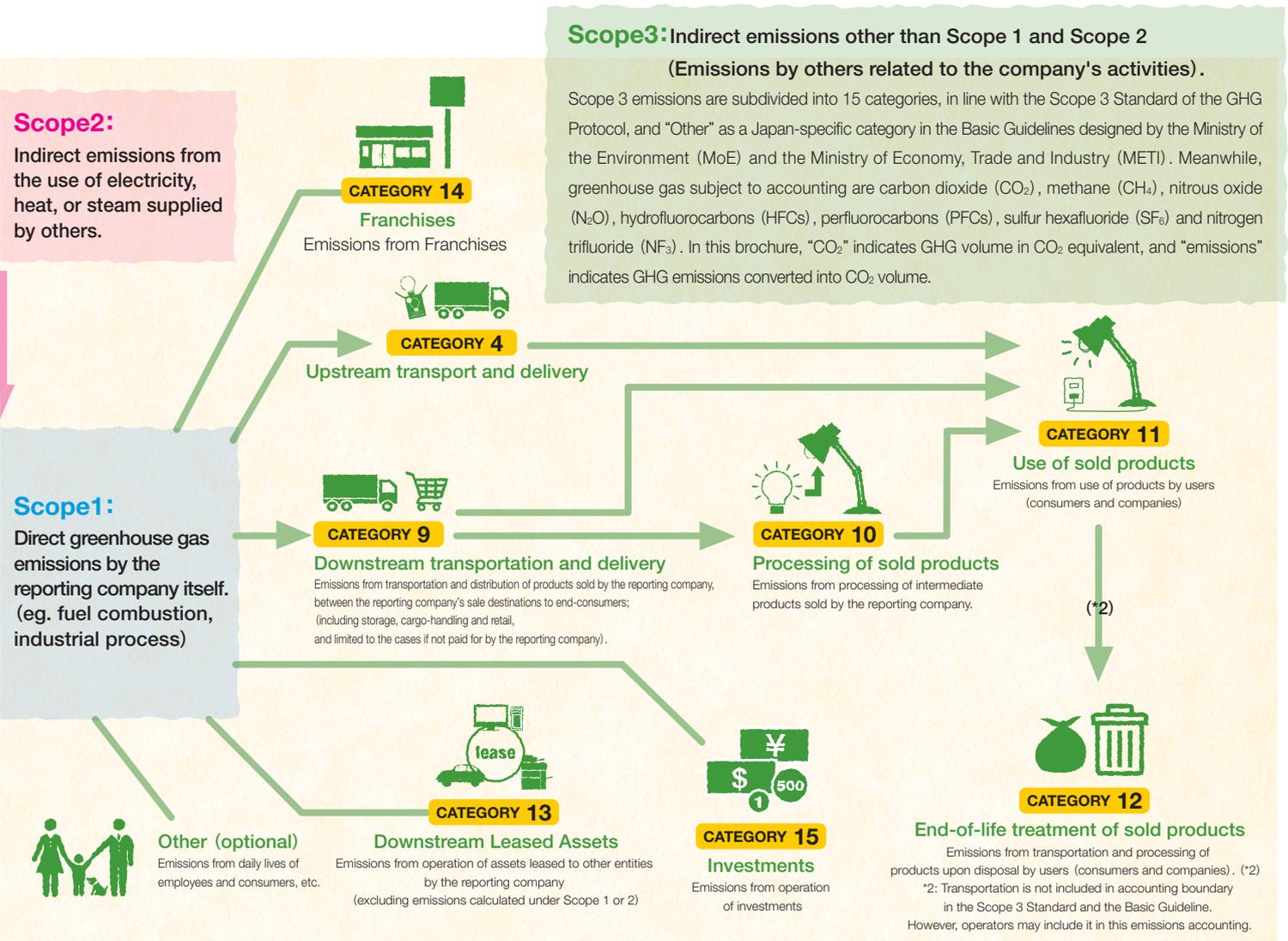
Figure 2 an example that an emission source is included in reporting boundaries of different entities



Figure 3 Differentiation of upstream/downstream processes

Differentiation of upstream/downstream processes

In the Scope 3 Standard, upstream/downstream is determined based on a flow of money, unlike life-cycle assessment (LCA) which is based on a flow of materials. Categories 1-8 of Scope 3 are relevant to upstream defined as "activities associated with purchased goods/services in principle" while Categories 9-15 are to downstream defined as "activities associated with sold goods/services in principle". For example, shipping transportation from shippers, which is in downstream in terms of flow of goods, is recognized as upstream in the Scope 3 Standard (Category 4).



Japanese Company's effort of supply-chain emissions accounting

Development of supply-chain emissions accounting in Japan

Calculating and determining the Scope 3 emissions makes it possible to discover each stages of the supply chain that involve higher levels of emissions, as well as those areas that offer greater potential for reducing emissions ; and this allows companies to implement efficient measures for reducing emissions in the overall supply chain.

It is important to help to raise awareness among other companies that make up the supply chain and among product users by calling on them to provide information, etc., in the process of determining supply chain emissions, and to endeavor to collaborate with other companies, etc., in order to promote the reduction of greenhouse gas emissions through cooperation among the companies that make up the supply chain.

Companies can increase their accountability to stakeholders, including other companies that make up the supply chain, through visualization and voluntary disclosure of supply chain emissions.

Thanks to such advantages, supply-chain emissions accounting gradually penetrates into Japanese companies. Figure 2 shows a trend seen in the CDP Japan 500 reports in recent years, indicating to what extent Japanese companies engage in this accounting practice. No significant change is observed in terms of the number of companies that conducted Scope 3 emissions accounting, while the number of categories that they included in Scope 3 emissions accounting is on the rise.

For example, companies⁵ that calculate eight categories or more account for 1.3% (3 companies) of the total in the CDP2012, 15.9% (36 companies) in the CDP2013 and 32.7% (72 companies) in the CDP2014. Moreover, as for those calculating 11 categories or more, it was merely 0.4 % (one company) in the CDP2012 and increased to 4.4% (10 companies) in the CDP2013 and then to 11.8% (26 companies) in the CDP2014.

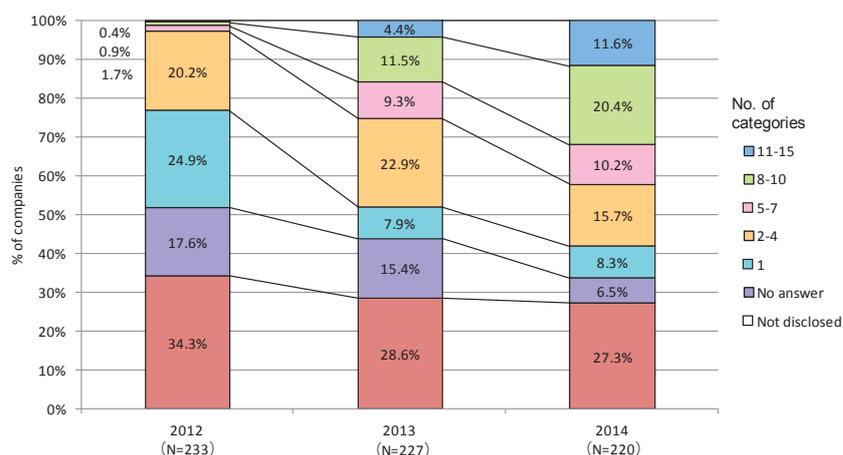


Figure 4 Trend in proportion of companies by number of categories included in Scope 3 accounting (comparison of CDP Japan 500 report by reporting year)

⁵ For each Scope 3 category, "calculate emissions" status requires that a company selects either of "Relevant, calculated" or "Not relevant, calculated" in CC14.la of the CDP Climate Change Questionnaire and then to disclose their accounting results. Meanwhile, in the CDP, options of "Other (upstream)" and "Other (downstream)" are created in addition to 15 categories of the Scope 3 Standard. Nevertheless, these options are not counted as a category included in the accounting.

Figure 5 shows a country breakdown of companies that conducted emissions accounting for nine or more categories of Scope 3 for the CDP Global 500 Report 2013. 25 companies in total covered nine or more categories, of which seven were Japanese companies which accounted for 28% of the total : the highest level on the world scale, showing that Japanese companies take positive attitude to perform Scope 3 emissions accounting.

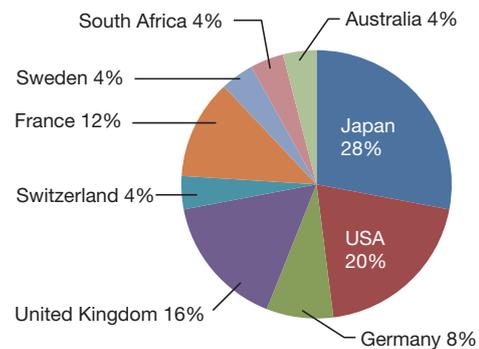


Figure 5 Country breakdown of companies that include nine or more categories in Scope 3 accounting

Characteristics of emissions accounting by Japanese companies, in terms of Scope 3 categories

Table 1 shows recent trends in number of companies that account for Scope 3 emissions by category, seen in the CDP Japan 500 reports. It appears that accounting practice by Japanese companies tends to focus more on upstream categories than on downstream ones. This is a reflection of Japan’s regulatory conditions : companies have been required to conduct management of upstream emissions in the supply-chain under several official programs for over decades, and those covered by such programs may have used the same data on upstream emissions in Scope 3 accounting.

For example, companies can account for Category 4 (Upstream transportation and delivery) emissions by using data that are originally prepared to satisfy the Act on the Rational Use of Energy. Specifically, this Act requires companies that outsource cargo transport of 30M-ton-km/year or more (“Specified Consigner”) to obtain data on emissions from transportation and report it to the government. These emissions are relevant to Category 4 of Scope 3, which means that companies subject to the regulation may use the existing data to report most of Category 4 emissions without additional works. (See P.7 to P.9 for more information on relations of Japan’s environmental regulations and Scope 3.)

Meanwhile, downstream categories of the supply chain have more respondent companies in number, as seen in Category 11 (Use of sold products) and Category 12 (End-of-life treatment of sold products), for example.

Table 1 Development of Scope 3 accounting by Japanese companies by category

Category	No. of companies			Change in No. of companies (③-①)
	① CDP2012	② CDP2013	③ CDP2014	
1. Purchased goods and services	28	66	92	64
2. Capital goods	3	39	75	72
3. Fuel- and energy-related activities	13	51	87	74
4. Upstream transportation and distribution	23	70	94	71
5. Waste generated in operations	13	70	104	91
6. Business travel	31	63	96	65
7. Employee commuting	18	55	93	75
8. Upstream leased assets	0	15	25	25
9. Downstream transportation and distribution	73	63	61	-12
10. Processing of sold products	5	13	17	12
11. Use of sold products	29	61	72	43
12. End-of-life treatment of sold products	9	48	67	58
13. Downstream leased assets	1	14	26	25
14. Franchises	0	2	9	9
15. Investments	1	10	24	23

Supply-chain emissions accounting and Public supports in Japan

Advantages of supply-chain emissions accounting under Japan's regulatory system

In Japan, there have been several official programs that require supply chain management, and companies covered by such programs may have used the same data to conduct supply-chain emissions accounting.

This chapter explains actual practices in Japan that how companies deal with supply-chain emissions accounting, by making correlations between the supply-chain management under Japan's environmental regulations and reporting coverage of supply-chain emissions.

Accounting for energy-related emissions (Correlation with Scope 1, Scope 2, Category 4 and Category 8 of Scope 3)

In Japan, companies with large-scale GHG emissions are required to account for emissions from their operations to report to the Government under the Accounting and Reporting System of the Partial Revision of the Act on Promotion of Measures to Cope with Global Warming (Revised Global Warming Countermeasures Act) and the Act on the Rational Use of Energy (Energy Saving Act). Outlines of the two regulations are as described below :

Global Warming Countermeasures Act

Established in 1998 triggered by conclusion of the Kyoto Protocol.

This law aims to formulate programs to fight against global warming as well as promoting reductions and controls of GHG emissions.

Energy Saving Act

Established in 1979 triggered by the Oil Crisis.

This law aims to promote energy saving practice in factories, transport, buildings as well as introducing efficient machineries and apparatus, while leveling electricity demand.

* The two laws are administered in an efficient manner : for example, where coverage of the laws is overlapped, the relevant operators may use the same data for reporting to each.

As seen above, Japanese regulatory system has set a ground for supply-chain emissions accounting, so that companies are able to perform accounting practices in an efficient manner, by using the same data under the reporting programs, not only for Scopes 1 and 2 emissions but also a part of Scope 3.

Table 2 shows correlations between the "Accounting and Reporting System" (which has close relation with supply-chain emissions accounting) and categories of supply-chain emissions. For example, energy consumption, one of the mandatory reporting items required of specified emitters, covers leased warehouses and buildings which are relevant to Category 8 of Scope 3. In other words, Japanese companies have traditionally handled these emissions as Scope 1 or Scope 2. Besides this, if an operator is designated as a specified transport emitter (Specified consigner), the same data prepared for these reporting schemes can be used to account for a part of Category 4 emissions.

Moreover, some of these regulations have penalty provisions against false reporting, which require operators to secure accuracy in data collection. Therefore, the same level of accuracy can eventually be secured in accounting result of supply-chain emissions if the same data that satisfied these regulations are used.

Table 2 Correlation between coverage of the Accounting and Reporting System and supply-chain emissions

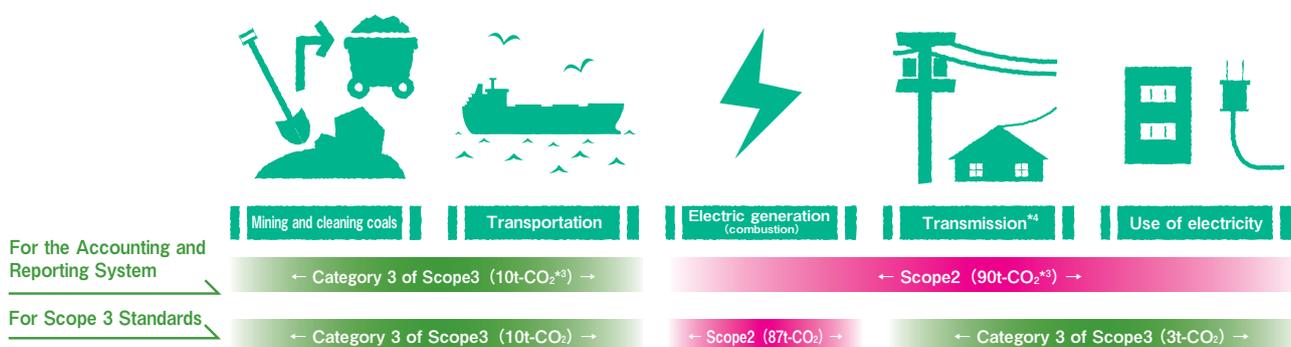
	Designated operators under the Accounting and Reporting System	Relevant scope or category
Specified emitter	Operator with 1,500kL or more per year of energy consumption in total of all business facilities.	Scope1, Scope2
	Operator that satisfies both of the following requirements : [1] One or more gases among its GHG emissions from all business facilities reach 3,000 t or more in CO ₂ equivalent in total. [2] It employees 21 or more full-time staff in total of all business facilities.	Scope1, Scope2
Specified transport emitter (Specified consigner)	Operator with 30 mil-ton-kilo ^(*) or more of freight transportation (including in-house transportation) associated with its own business operation.	Category 4
Specified transport emitter (Specified freight Carriers)	Operator that owns transportation machinery and equipment with certain level of capacity. (e.g., 200 or more trucks ; ships with 20,000 t or larger in total of shipping tonnage, etc.)	Scope1, Scope2

*1 : Transportation (ton-kilo) = freight volume (ton) X freight distance (kilometer)

With regard to the Accounting and Reporting System, the Government of Japan issues emission factors by fuel and those by power generator every year ^(*). Operators may use these official emission factors to obtain emission data as shown in the table above.

*2 : Emission factor by electric utility operator

In Scope 3 Standard of the GHG Protocol, electric transmission and distribution (T&D) are classified in Category 3, assuming unbundling of electric utility services. In Japan, however, where electricity generation, transmission and distribution remain bundled in most cases of power supply, emission factors of electric utilities include emissions from transmission and distribution. As the result, many companies calculate T&D loss in Scope 2.



*3 : Values in the figure are tentative ones.

*4 : In Scope 3 Standard of the GHG Protocol, electric transmission and distribution (T&D) is classified in Category 3, assuming unbundling of electric utility services.

Figure 6 Differentiation between Scope 2 and Scope 3

Accounting for emissions from waste treatment (Correlation with Category 5)

As for disposal of wastes from business activities, operators are required to conduct appropriate treatment in accordance with the Waste Management and Public Cleaning Act. In case of outsourcing, operators must ensure to keep appropriateness of treatment until final treatment is completed. The Government therefore implements the “Manifest System of Industrial Waste” in which industrial wastes are handled along with a manifest form at each stage, allowing operators to make sure appropriateness in the waste treatment flow.

When an operator entrusts external operators for treatment of its industrial wastes, the operator as waste emitter fills out the form to provide information on the waste, such as type and volume of waste and names of operators that undertake transport, final treatment, etc. Such information is passed on to each operator in the waste treatment process. Meanwhile, each operator returns the manifest to the emitter with process completion notice at each stage, which provides the emitter opportunities to check appropriateness of the waste treatment in accordance with its entrustment.

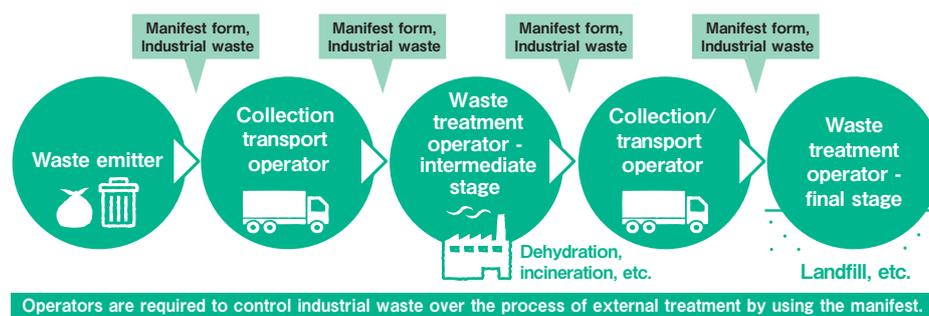


Figure 7 Outline of the Manifest System of Industrial Waste

As shown above, most of the Japanese companies already have data on their emissions of industrial wastes, such as volume and treatment method, in order to comply with the laws. It is advantageous for Japanese companies to use such data which allows them to improve accuracy in accounting for Category 5 emissions.

Accounting for emissions from End-of-life treatment of sold products (Correlation with Category 12)

As with the waste, Category 12 is also the case that Japanese operators are able to use existing data prepared to comply with another regulation to improve accuracy in accounting.

This is based on the mandatory recycling (as resources) under the current regulations. Japan has six recycling acts established according to characteristics of each item. The “Act on the Promotion of Sorted Collection and Recycling of Containers and Packaging,” the oldest of the six, requires specific operators to conduct recycling (as resources). Operators covered by the law include those who manufacture or import specified containers and packages or who use containers and packages to sell their own products. There are five materials that are subject to mandatory recycling under the regulation ; specifically, “glass containers,” “PET bottles,” “paper containers and packaging” and “plastic containers and packaging.”

In order to comply with the regulation, Japanese companies have data on volume of containers and packages used for sold products, which can be used to calculate a part of Category 12 (emissions from waste treatment for containers and packages), making accounting results more accurate.

Supports for operators by the Government

The government of Japan has introduced supportive functions for operators in order to promote supply-chain emission accounting in the country. Figure 6 shows an overall flow of support options provided by the government, which is characterized with its integrated approach. The point is to provide wider access to accounting practice for various operators at various stages, based on the recognition that operators should engage in supply-chain emissions accounting in accordance with their own purposes in a step-by-step manner. In addition to the supports for accounting, the government has also developed a platform to release information on supply-chain emissions, allowing operators publicize their own accounting results.

The following paragraphs provide details on each function of the governmental supports.

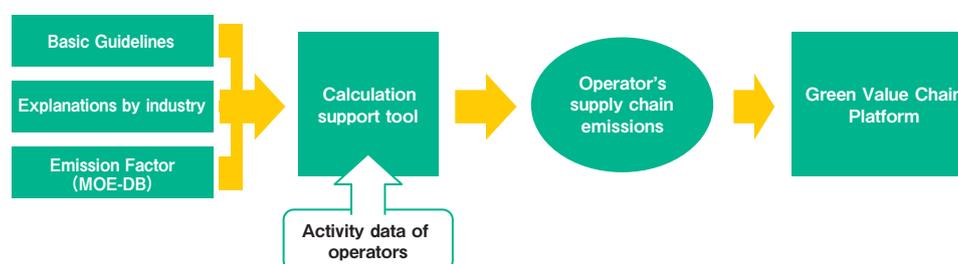


Figure 8 Outline of supportive functions for operators provided by the Government of Japan

Basic Guidelines on Accounting for Greenhouse Gas Emissions throughout the Supply Chain

Basic Guidelines on Accounting for Greenhouse Gas Emissions throughout the Supply Chain (referred to below as the “Basic Guidelines”) presents the approach taken by Japanese companies in calculating supply chain emissions, based on the status of existing endeavors in Japan as well as international trends. While pursuing consistency with the Scope 3 Standard, etc., these are Japanese guidelines formulated in accordance with conditions in Japan.

This guideline is characterized by making correlations between the laws & regulations in force with supply-chain emissions accounting in Japan, which helps operators to understand a basis of accounting methods while saving burdens for accounting.

Explanations by industry

Each industry has its own conditions in supply-chain emission accounting, and categories that are difficult to obtain data or of importance can vary depending on industries. Therefore, in order to correspond to such industry-specific conditions, the government is working on to develop “Explanations by industry” to supplement the “Basic Guidelines.” The Basic Guidelines along with the explanatory materials help operators to conduct accounting that reflects industry-specific conditions. The explanatory materials have been developed for the four industries as shown below.

- Cement manufacture
- Retailing
- Logistics
- Construction (prefabricated house)

The government will prepare these explanatory materials in response to request from industries.

Calculation support tool

This accounting tool has been designed to conduct calculations as described in the Basic guidelines. This Excel-based tool covers all accounting methods provided in the Basic Guidelines and allows operators to calculate supply-chain emissions. Meanwhile, the tool provides an easy-to-customize feature, taking advantage of excel format.

Emission Factor

There are two methods for determining a company's supply chain emissions, as follows :

- [1] Obtaining emissions information from related trading partners
- [2] Performing calculations with formulas (Emissions = Amount of activity x Emissions unit value)

From the standpoint of accurately determining the actual status of emissions and managing emissions in cooperation with suppliers, it would be desirable to obtain emissions information from trading partners. However, these are not so simple in some cases. Data availability can be an obstacle for operators to take the first step toward supply-chain emissions accounting.

In this context, the government has compiled emission factors that are useful at the initial stage of supply-chain emissions accounting, which are released as the emission factor database for corporate GHG emissions accounting over the supply chain (hereafter referred to as "MOE-DB").

Table 3 shows that to what extent Japanese companies utilize the MOE-DB in emissions accounting, based on the survey result of the CDP Japan 500 Climate Change Report 2013. This table covers Japanese companies that have made responses on 10 or more categories in the survey. Regarding Categories 1, 4, 6 and 12 that a number of companies conducted emissions accounting, many of the respondent companies have used emission factors from the MOE-DB, reflecting that this database has been widely used among companies that perform emissions accounting.

Table 3 Utilization of the database for emissions accounting

Category	Total number of company	MOE-DB
Category 1 : Purchased goods and services	16	4
Category 4 : Transportation and delivery (upstream)	12	11
Category 6 : Business travel	11	9
Category 12 : End-of-life treatment of sold products	13	9

Green Value Chain Platform

The Green Value Chain Platform (hereinafter "GVC Platform") was launched to provide necessary information for supply-chain emissions accounting in Japan. For understanding and managing supply-chain emissions, operators need to utilize existing accounting results in an efficient manner, in addition to accounting of their own emissions. Therefore, the GVC platform works to collect information that facilitate utilizing accounting results, through introducing actual practices by various companies in Japan and abroad.



Figure 9 Green Value Chain Platform homepage (<http://www.gvc.go.jp/en/index.html> *)

* This URL address will be changed to the following from 1st April 2015. (http://www.env.go.jp/earth/ondanka/supply_chain/gvc/en/index.html)

S how case : Advanced case example of Japanese companies

As described above, the Government of Japan provides various supports to operators to help their supply-chain emissions accounting, including the GVC Platform. This website contains actual examples of emissions accounting from more than 60 companies to be used as references by companies that wish to perform supply-chain emissions accounting.

This section picks up six companies out of the 60+, and features their advanced accounting practices.

As most of them operate businesses on a global scale, we believe these examples would be useful reference information for overseas companies, too.

It should be noted that these companies are outstanding because of not only the number of categories they perform emissions accounting, but also various activities they launched based on the accounting results. Therefore, these examples will provide some clues to both aspects of how to perform accounting for supply-chain emissions as well as how to utilize accounting results.

case	Company name	Industry type	Page
1	Ube Industries, Ltd.	Chemical	13
2	Kao Corporation	Manufacture of chemical products	15
3	Shiseido Company, Limited	Manufacture of chemical products	17
4	Ricoh Company, Ltd.	Manufacture of electronics	19
5	AEON Co., Ltd.	Retail trade	21
6	Lawson, Inc.	Retail trade	23

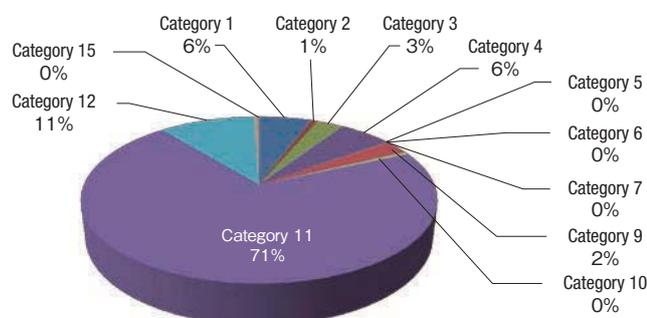
Case 1 : Ube Industries, Ltd.

Ube Industries Ltd. is the company that manufactures chemical and cement products as the core business.

The Ube Group's supply-chain emissions can be characterized by Category 11 "Use of sold products" which accounts for over 70%. Therefore, in order to promote emission reductions, we will firstly focus on this category and provide products and technologies with

lower environmental burden. We will also work to improve efficiency in logistics across the Ube Group and trading partners. CO₂ emissions from transportation stages also account for a large share of the total, because of the operational reasons that handle a lot of bulk-based items for both procurement of materials and fuels or shipment of products. Therefore, we take every effort for emission reductions, such as improving efficiency in logistics. For obtaining estimation values, we develop a scenario that enables us a neutral evaluation and is in line with actual situation to reflect positive effects from our emission reduction actions.

The accounting result of UBE group's Scope 3 emissions (FY2013)



Background and purpose for accounting

We have taken efforts to reduce Scope 1 and Scope 2 emissions based on the investment for energy saving and GHG reductions. We expect that accounting for supply chain emissions will leverage Ube's overall actions against global warming, considering the extent of impacts that our business operations may affect, with a new perspective of emission reductions over the supply-chain.

This accounting also contributes to our corporate social responsibility strategy, credibility improvement and effective response to disclosure requests from third parties.

Utilization of accounting results

Accounting results provides us an overview of emissions from our business operations. Based on this, we have discussions on potentials to reduce emissions for each category.

We use the accounting results as a ground of the Group's efforts to develop and expand environmental-friendly products and technologies.

As responses to disclosure requests from external parties, we use the accounting results in our CSR reports and as a resource to deal with surveys.

Advantages of accounting

This accounting visualizes GHG emissions from business operations, which enables us to give explanation to external parties under a common rule. By assessing and discussing reduction opportunities for each category, we can develop emission reduction actions without missing out any relevant cases. We expect some synergy effects over the business segments or with external parties, which may happen once an action taken by individual division comes to connect with those by others, such as creating business opportunities and cooperating with other entities.

Internal accounting organization

The Environment Department under the Headquarters performs emissions accounting based on existing data collected from the Headquarters and each business department.

We do not collect data that is newly-prepared for the sole purpose of accounting.

Tasks to account for supply chain emissions

We intend to expand accounting boundary (overseas) and improve accuracy of accounting. For Category 11, we will work to obtain accurate data to the extent possible, though we recognize difficulties in scenario setting for our products which has a wide variety of usage.

We consider using a simplified accounting approach in order to save workload.

As for the third-party assurance, we consider taking it on a regular basis, such as every three years instead of annually.

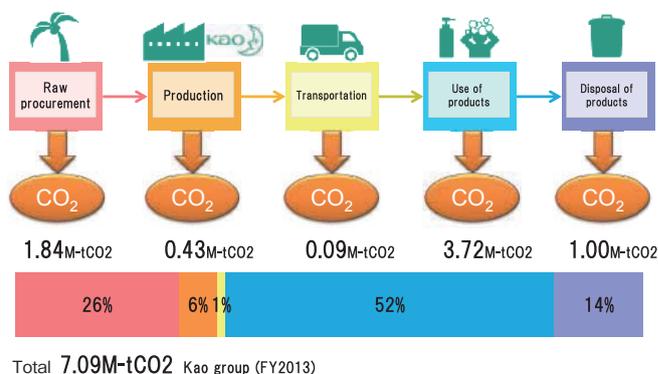
Category	Accounting methods	
	Activity data	Emission factor
Category 1 : Purchased goods and services	• Purchased volume and price of raw materials and supplies	• Basic DB of the CFP Program • Values from literatures
Category 2 : Capital goods	• Amount of capital investment	• MOE-Database
Category 3 : Fuel and energy related activities not included in Scope 1 or 2	• Consumption of fuels, heat and electricity, and distance of delivery	• Basic DB of the CFP Program
Category 4 : Transportation and delivery (upstream)	• Purchased volume and shipping volume and distance related to cargo owners' transportation	• Basic DB of the CFP Program
Category 5 : Waste generated in operations	• Volume of waste generation by type	• MOE-Database
Category 6 : Business travel	• Transportation expenses that the company owes	• MOE-Database
Category 7 : Employee commuting	• Transportation expenses that the company owes	• MOE-Database
Category 8 : Leased assets (upstream)	• NA (as included in Scope 1 and 2)	-
Category 9 : Transportation and delivery (downstream)	• Shipping volume of products (FOB)	• Basic DB of the CFP Program
Category 10 : Processing of sold products	• Shipping volume of products	• Values from literatures
Category 11 : Use of sold products	• Based on the scenario developed	• Emission factor in the Global Warming Countermeasures Act
Category 12 : End-of-life treatment of sold products	• Shipping volume of products (FOB)	• MOE-Database
Category 13 : Leased assets (downstream)	NA	-
Category 14 : Franchises	NA	-
Category 15 : Investments	• Periodic financial statements of invested companies	• Ownership ratio

Case 2 : Kao Corporation

Kao Corporation is the company of manufacturing and sales of household articles, daily commodities, cosmetics, industrial chemicals, etc.

Regarding our supply-chain emissions, emissions from sold products account for more than 50% of the total emissions, while more than a quarter is from raw-material stages.

In the raw materials procurement stage we are reducing materials by making products more compact, reducing the weight of containers, using refillable products, etc. As part of “Eco Together,” we have recognized the need for cooperation with our suppliers. We have implemented various reduction activities at factories and operation centers for the production stage. With regard to the usage stage, we are developing and providing products that reduce the load during use. For example, we are making laundry detergents that only require one rinse cycle. For the waste stage, we are reducing materials by making containers lighter and promoting the use of refills. In addition, we are also promoting the introduction of bio-polyethylene, etc.



Background and purpose for accounting

After conducting a company-wide life cycle assessment (LCA), it was discovered that the hot spot was Scope 3. Based on that result, we announced the “Kao Environmental Statement” in 2009 with the goals of reducing company-wide CO₂ emissions on a life-cycle basis and reducing water usage in the product usage phase. In order to understand the progress in achieving the above goals and to promote reduction activities, we are accounting for company-wide life cycle CO₂ emissions and water usage in the product usage phase.

Utilization of accounting results

We are using LCA in product development. Reduction of life cycle CO₂ emissions is a display standard requirement for the “Eco Together” mark (product environment label). The results are being used to report the progress in achieving the above goals in our sustainability reports, to introduce our activities at the Kao Eco Lab Museum and various environmental exhibits, and to respond to various questionnaires.

Advantages of accounting

Making the environmental load throughout the value chain “visible” will help sustain the global environment. By exposing the hot spot, we are able to take effective countermeasures. Accounting helps us avoid risks and create business opportunities. Our analysis showed that CO₂ emissions were high in the product usage phase. Therefore, we have been developing products with lower environmental loads in the usage phase. In addition to “Eco Together” with customers in this way, we are also calling for “Eco Together” with our business partners and all of society in order to make efforts from the point of view of life cycles.

Internal accounting organization

Accounting is conducted for individual products and with our internal system that calculates the company LCI data (Kao Japan). About 10,000 products are in the product database, and by linking the various internal databases we are making registration work more efficient. We also have data for our major

products outside of Japan. Employees in charge of product development implement LCA for products under development by using the data in the above systems, and that information is used in product development activities.

Tasks to account for supply chain emissions

Tasks for society as a whole include producing calculation tools and databases, and spreading accounting tools, so that anyone can conduct an LCA easily.

For those starting to account for supply chain emissions

Because the makeup of environmental loads differs depending on the industry, the first thing to do is to find the “hot spot” for your company’s emissions.

Category	Accounting methods	
	Activity data	Emission Factor
Category 1 : Purchased goods and services	• Raw materials input	• Actual data from supplier investigation • Third-party’s database • Literature
Category 2 : Capital goods	• Investment amount	• MOE-Database
Category 3 : Fuel and energy related activities not included in Scope 1 or 2	• Purchased amount	• MOE-Database
Category 4 : Transportation and delivery (upstream)	• Raw materials input, the Act on the Rational Use of Energy • Product volume is calculated according to the Energy Saving Act as a specific cargo owner	• Emission factor based on the Act on the Rational Use of Energy
Category 5 : Waste generated in operations	• Waste weight	• MOE-Database
Category 6 : Business travel	• Number of employees	• MOE-Database
Category 7 : Employee commuting	• Number of employees	• MOE-Database
Category 8 : Leased assets (upstream)	• Included in Scope 1 and 2	-
Category 9 : Transportation and delivery (downstream)	• Product volume * Estimated from product transport data in Category 4	• Kao’s original database
Category 10 : Processing of sold products	• Product volume	• Kao’s original database
Category 11 : Use of sold products	• Depending on the scenario set up	• Emission factor based on the Act on the Rational Use of Energy
Category 12 : End-of-life treatment of sold products	• Depending on the scenario set up	• Third-party’s database
Category 13 : Leased assets (downstream)	• Included in Scope 1 and 2	-
Category 14 : Franchises	• Not applicable	-
Category 15 : Investments	• Investment amount (stocks held are subject)	MOE-Database

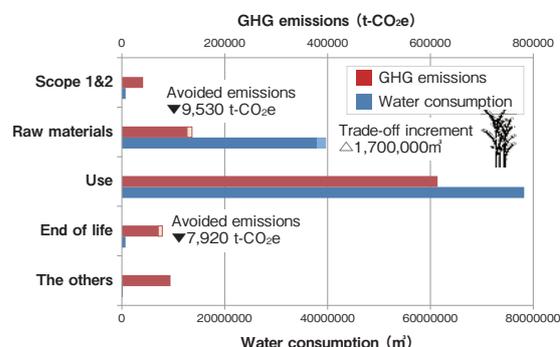
Case 3 : Shiseido Company, Limited

Shiseido Co., Ltd. is the company of manufacturing and sales of cosmetics, household articles, daily commodities, etc.

Shiseido's GHG emissions through the supply chain of Japanese activity show a distinctive pattern : a considerable proportion of indirect emissions from both upstream and downstream of the value chain, accounting for 19 times of its direct emissions. Category 1 (Purchased goods and services = raw-material procurement), Category 11 (Use of sold products) and Category 12 (End-of-life treatment of sold products) have been identified as the hot spots.

Meanwhile, 99% of freshwater consumption comes from use of sold products (shampoos and cleansers) and cultivation of raw-material plants.

Seeking to cut Category 1 and Category 12 emissions while reducing waste generation, we promote to sell refill products and actively introduce bio-plastic (sugarcane-based polyethylene (PE)) containers. As of December 2014, our refill product lineup reaches over 700 items. As a result, 17 thousands t of avoided GHG emissions due to our efforts in Category 1 and Category 12 has figured out. On the other hand, 1,7 million m³ of water was additionally consumed to sugarcane production as the trade-off.



In 2011, we adopted sugarcane-based PE as material of shampoo containers and put the product line into the market, the first case of its kind in Japan. We continue to expand the use of biomass-based materials, toward the targets of replacing over 70% of regular PE used in Japan and over 50% of total plastics use by 2020.

Background and purpose for accounting

In the "Our Way," which defines action guidelines for employees, we declare "We promote environmental initiatives in line with our own stringent standards, and consider biodiversity as we aim for a sustainable society in which humanity and the Earth coexist beautifully." To this end, we promote "Shiseido Earth-care Project" under the three major commitments of (1) conserving biodiversity (i.e., preserving the bounty of the Earth), (2) reducing CO₂ emissions and (3) reducing use of resources with participation of all group employees.

Analysis on value-chain CO₂ emissions helps us to reduce adverse impacts on global environment in a more efficient manner with overlooking, bird's-eye perspectives. Meanwhile, we consider this accounting as a part of value-chain management to avoid or reduce operational risks from environmental factors.

We performed emissions accounting to the cosmetics segment in Japan, the core business sector.

Utilization of accounting results

We use the accounting results for hot-spot analysis ; estimation of effects from reduction action and trade-offs ; information disclosure to the society, NGOs and investors ; and projection of operational risks underlying in supply chain.

Advantages of accounting

Accounting results clearly showed effects of CO₂ emission reductions from our environmental activities such as promotion of refill products (refilling or replacing) and application of bio-plastics into container materials. It also clarified CO₂ hot-spots in our emissions.

Internal accounting organization

The CSR Department of the Headquarters aggregates necessary data and conducts collective accounting. Development is underway for our original value-chain evaluation system “Calculator of Life cycle Inventory for Corporate (CLIC)” in order to avoid human errors in calculation while saving man-powers. Besides CO₂ emission reductions, we also engage in evaluation of freshwater consumptions over the value-chain.

Tasks to account for supply chain emissions

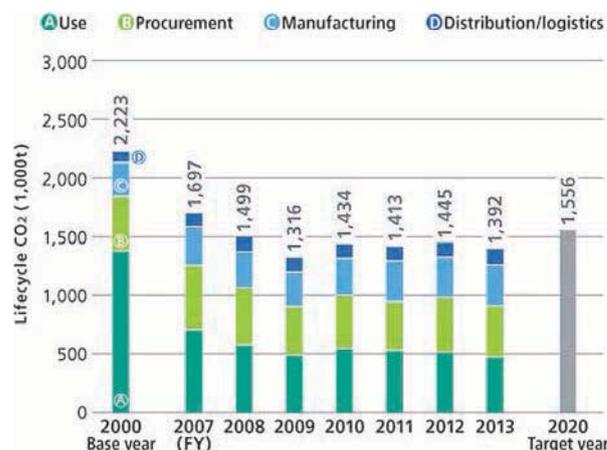
Accuracy in accounting is uneven depending on categories : some are accurate while others are very rough. Accounting boundary doesn’t cover some of the business activities, such as those related to products freebies and advertising publicity. We also need to prepare for data collection from overseas business bases.

Category	Accounting methods	
	Activity data	Emission factor
Category 1 : Purchased goods and services	• Purchased Volume of raw materials and supplies	• CFP Communication Program DB
Category 2 : Capital goods	• Purchased amount of capital goods	• Emission factor per 3EID-based purchased amount • Building evaluation under the CASBEE
Category 3 : Fuel and energy related activities not included in Scope 1 or 2	• Energy consumption from electricity and steam use	• Energy factor per energy used
Category 4 : Transportation and delivery (upstream)	• Volume and distance of transportation related to shippers’ transportation	• On ton-kilo basis
Category 5 : Waste generated in operations	• Waste generation by type and treatment method	• CFP Communication Program DB
Category 6 : Business travel	• Transportation expenses that the company owes • Air ticket fare • “Shinkansen” ticket fare	• CFP Communication Program DB
Category 7 : Employee commuting	• Transportation expenses that the company owes • Train ticket fare	• CFP Communication Program DB
Category 8 : Leased assets (upstream)	-	-
Category 9 : Transportation and delivery (downstream)	-	-
Category 10 : Processing of sold products	-	-
Category 11 : Use of sold products	• Quantity of product sold • Water and utility consumption under standard condition	• CFP Communication Program DB
Category 12 : End-of-life treatment of sold products	• material composition of containers / packaging of products, Quantity of product sold • waste treatment scenario by type of material	• CFP Communication Program DB
Category 13 : Leased assets (downstream)	-	-
Category 14 : Franchises	-	-
Category 15 : Investments	-	-

Case 4 : Ricoh Company, Ltd.

Ricoh Company, Ltd. is the company of manufacture, sales and leasing of copiers, printers and projector, etc.

We consider Category 1 and Category 11, our hot spots, as the key areas to achieve Ricoh Group's Mid- and Long-Term Environmental Impact Reduction Goals. With regard to these categories, we have proceeded R&D to improve energy- or resource-saving performance of products, lowering and controlling our absolute GHG emissions regardless of increase in quantity of sales or product sophistication. In coming years, we expect a considerable expansion of sales of laser printers in emerging economy countries. Sustaining business growth on one hand, we strive to achieve GHG emission reduction goals through technological development. (For details of progress to the Mid- and Long-Term Environmental Impact Reduction Goals, see page 34 of the Ricoh Group Sustainability Report 2014.)



Background and purpose for accounting

Ricoh Company considers that actions to reduce environmental impacts should be implemented after identifying areas with large emissions (hot spots) by quantifying the impacts from business operations. Clarifying environmental impact caused by all our businesses and reducing them effectively : we introduced this concept of "Eco Balance" in 1998 as a tool to support the basis of Ricoh's environmental management. The idea of supply-chain emissions accounting is in line with our Eco Balance concept. By utilizing accounting results obtained under the Eco Balance, we have submitted responses to the CDP's Scope 3 emissions accounting.

Utilization of accounting results

We use the accounting results to develop Ricoh Group's Mid- and Long-Term Environmental Impact Reduction Goals, as well as the Environmental Action Plan.

For achievement of the goals and plans, we develop and implement actions and evaluate subsequent reductions. We use the accounting results in this flow, enforcing the PDCA cycle to improve our sustainable environmental management.

Moreover, we disclose outcomes of such environmental actions to stakeholders in a quantitative way.

Advantages of accounting

This accounting clarifies hot spots in supply chain. In the case of our company, accounting results highlighted Category 1 and Category 11 as what we should tackle first.

With the results, we can show effects of emission reductions in a quantitative way.

There are some areas that are inherently difficult to reduce emissions by our own efforts. However, Scope 3 categories shed light on these areas, enabling us to take actions toward emission reductions in cooperation with related parties.

Internal accounting organization

The environmental management promotion division plays a central role in emissions accounting, including

data collection from relevant divisions worldwide.

For such data collection and accounting, we use our own environmental management information system that we have developed.

For data that cannot be obtained by ourselves, we perform accounting based on hearing surveys or scenarios settings.

Tasks to account for supply chain emissions

Supply-chain emissions are obtained by multiplying activity data by emission factor. Performance of activities should be quantified in an appropriate manner for target management, and to do so, it is necessary to collect activity data as well as selecting or developing emission factors. For example, in case where a material with lower emissions than conventional ones is applied, we develop a new emission factor in order to reflect such improvement.

Category	Accounting methods	
	Activity data	Emission Factor
Category 1 : Purchased goods and services	• Amount of purchased raw materials and parts/components	• JLCA-LCA database, etc.
Category 2 : Capital goods	• Amount of capital investment, etc.	• 3EID
Category 3 : Fuel and energy related activities not included in Scope 1 or 2	• Energy consumption (as included in Scope 1 & 2)	• Emission factor for production and transportation of energy used
Category 4 : Transportation and delivery (upstream)	• Energy consumption ; distance and fuel type ; volume and distance of transportation	• Emission factor for each calculation methodologies
Category 5 : Waste generated in operations	• Amount of waste sent to final disposal sites from the manufacturing facilities	• Emission factor by type of waste
Category 6 : Business travel	• Transportation expenses that the company owes by mode	• 3EID
Category 7 : Employee commuting	• Transportation expenses that the company owes by mode	• 3EID
Category 8 : Leased assets (upstream)	• Emissions from leased offices based on the number of people (excluding emissions from leased offices that are included in Scope 1 and 2 totals)	• Emission factor for energy consumption
Category 9 : Transportation and delivery (downstream)	• Weight of products sold by the company and distance based on scenarios	• On ton-kilo basis by regions
Category 10 : Processing of sold products	• Amount of products that are not final products	• 3EID
Category 11 : Use of sold products	• Total energy consumption of products based on the assumed usage and life of the sold products	• Emission factor for energy consumption
Category 12 : End-of-life treatment of sold products	• Weight of waste	• Emission factor by type of waste
Category 13 : Leased assets (downstream)	• Energy consumption from the use of assets leased by the Ricoh Group's leasing company (Ricoh Leasing) (excluding leased Ricoh products that are included in Cat 11 and assets leased to the Ricoh Group that are included in Scope 1 & 2 totals)	• Emission factor for energy consumption
Category 14 : Franchises	NA	-
Category 15 : Investments	• Stock ownership ratio of companies invested by Ricoh Company, Ltd.	• Emissions from Scope1 and 2 of companies invested by Ricoh Company, Ltd.

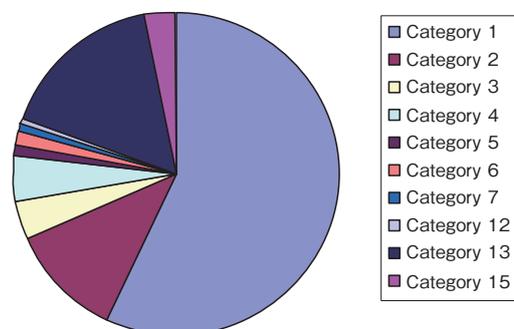
Case 5 : AEON Co., Ltd.

AEON Co., Ltd is the company of retail business as its core (especially, “GMS : General Merchandise Store”), while developing multiple businesses including financial service, shopping center development and service, etc.

AEON’s supply-chain emissions are characterized with a large share of Category 1 “Purchased goods and services” which accounts for more than 50% of total emissions. In addition, Category 13 “Leased assets (downstream)” also accounts for a large share, which includes emissions from energy use by tenants.

With regard to our supply chain, we have implemented measures to make CO₂ emissions visible and to specify the “hot spots” and we shall continue our reduction activities.

In order to implement specific actions, we have specified boundaries to collect data from our main group businesses ; i.e., the GMS (General Merchandise Store) business and SM (Supermarket) business. We have collected more activity data than ever before in order to specify the amount of reductions and in order to control reductions.



Scope 3 Emissions Percentages for the GMS (General Supermarket) Business and SM (Supermarket) Business of the Aeon Group

Background and purpose for accounting

We understand that accounting can be used to help us recognize our Scope 3 emissions and consider countermeasures.

Utilization of accounting results

Because of the external demands for disclosure in recent years, our first thought is to provide accurate information to our stakeholders..

Advantages of accounting

We started our efforts with the hope that understanding our Scope 3 emissions would help us specify our “hot spots” and find ways to reduce emissions.

Internal accounting organization

We are using an organization based on the ISO140001 and ISO50001 management systems, and are making calculations based on the progress reports from our related group companies.

Tasks to account for supply chain emissions

The urgent tasks are to link these activities with our corporate strategy, specify the areas in which we will aggressively reduce emissions and set target milestones.

For those starting to account for supply chain emissions

You should set internal goals for CO₂ reductions, such as reducing energy and materials usage, and accounting should start from areas in which progress is managed.

Category	Accounting methods	
	Activity data	Emission Factor
Category 1 : Purchased goods and services	• Sales by product type	• Emission factor per amount
Category 2 : Capital goods	• Capital investment amount	• Emissions factor per capital goods
Category 3 : Fuel and energy related activities not included in Scope 1 or 2	• Energy usage	• Emission factor per energy volume
Category 4 : Transportation and delivery (upstream)	• Fuel usage for transport by cargo owner	• Emission factor per fuel
Category 5 : Waste generated in operations	• Emissions by treatment method for various types of waste	• Emission factor by treatment method for various types of waste
Category 6 : Business travel	• Transportation expenses paid (by means of transportation)	• Emission factor per transportation expenses paid
Category 7 : Employee commuting	• Transportation expenses paid	• Emission factor per transportation expenses paid
Category 8 : Leased assets (upstream)	• We include these as Scope 1 and 2 greenhouse gases	
Category 9 : Transportation and delivery (downstream)	• Because the contribution to lowering overall greenhouse gas emissions is small, we have not included this in our calculations.	
Category 10 : Processing of sold products	• Because the contribution to lowering overall greenhouse gas emissions is small, we have not included this in our calculations.	
Category 11 : Use of sold products	• We have not included this in our calculations this time.	
Category 12 : End-of-life treatment of sold products	• Emissions by waste type	• Emission factor by waste type
Category 13 : Leased assets (downstream)	• Energy usage by tenants	• Emission factor per energy volume
Category 14 : Franchises	• Not applicable in our calculations for the business scope this time.	
Category 15 : Investments	• Greenhouse gas emissions from companies that we have shares in.	
Others	• We have not included this in our calculations this time.	

Case 6 : Lawson, Inc.

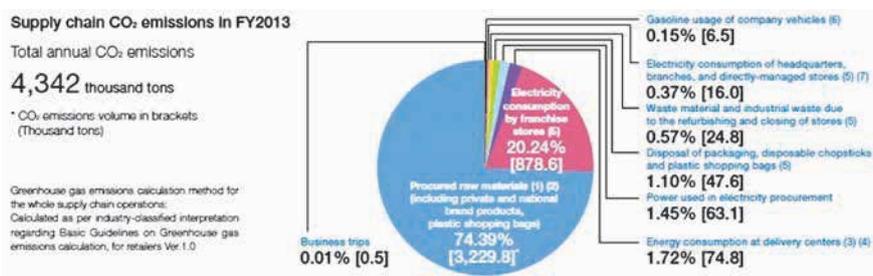
Lawson, Inc. is the company of Convenience store franchise chain.

The feature of our supply-chain emissions is that more than 70% of total emissions comes from Category 1

“Purchased goods and services.” Meanwhile, as the most of our stores are operated by direct franchise holders, a large proportion of emissions is from Category 14 “Franchises.”

Based on the accounting result, we have taken several actions to reduce supply-chain emissions, which include: introducing energy-saving appliances such as high-efficient devices, non-fluorocarbon (CO₂ refrigerant) deep freezers and refrigerators; promoting cooperative distribution and introducing “eco-tires”; providing energy-saving training by store supervisors; reducing use of plastic bags; reducing weight of packaging materials; promoting use of non-petroleum fuels, etc.

The accounting result has clarified which part of our supply chain would have higher potential of emission reductions. Therefore, by using the internal ISO14001 system, we will pursue more effective approaches to reduce emissions. Specific actions for each issue will be discussed and implemented in cooperation with relevant business segments.



Background and purpose for accounting

We conduct supply-chain emission accounting as a part of corporate social responsibility. Besides emissions accounting within the company on its own, accounting for CO₂ emissions from the entire supply chain enable us to understand a degree of impacts that our overall operation may affect global warming. We also use this accounting to calculate emissions for carbon offsetting that we conduct to our merchandise. Disclosing our supply-chain CO₂ emissions data to customers will lead to promote carbon offset practices, raise customers' awareness and increase sales of relevant products. Moreover, through this accounting, we are able to respond to disclosure requests from stakeholders, fostering a better understanding on our efforts toward CO₂ emission reductions.

Utilization of accounting results

We shall know the areas in the supply chain in which emissions are high and be able to study areas (items) in which there are room for reduction. For example, we shall promote supply chain-wide use of high-efficient energy-saving appliances that Lawson Inc. has introduced, after cost-effectiveness of such appliances is verified. In addition, we shall disclose the information in our consolidated reports, environmental reports and web site, and for answering questionnaires. By developing carbon offsetting products and promoting the purchase of environment friendly products by customers, we shall be able to promote environmental activities with them.

Advantages of accounting

By executing the above we shall be able to clarify our reduction potential, assessment reduction measures, disclose information about emissions in our supply chain, and promote environmental activities with our customers.

Internal accounting organization

The Environmental Promotion Department will collect data. The sources will be as follows :

- Vendor and distribution center data → Questionnaires to each company
- Waste Electronic manifests, waste management company data, Container Recycle Act contract materials
- Other purchased amounts → Accounting documents, etc.

Calculations will be made by the same department.

Tasks to account for supply chain emissions

With respect to Category 1 which accounts for a majority of our emissions, our current calculations are made by applying a rough monetary based emission factor, so that reductions from small changes in products (such as changes in raw materials) cannot be reflected. We also believe that changes in prices because of inflation and the like will have a big effect.

Because emissions increase as a company grows, it is necessary to use intensities. In the future, we shall determine the intensities to use based on the products and services that we handle.

For those starting to account for supply chain emissions

First, by grasping an understanding of the whole, you should be able to see the areas that you should focus on. This will also be invaluable data about the areas you can reduce emissions in, when setting priorities (including cost effectiveness).

Category	Accounting methods	
	Activity data	Emission Factor
Category 1 : Purchased goods and services	• Purchased volume of raw materials and supplies	• Price-based emission intensity from 3EID
Category 2 : Capital goods	-	-
Category 3 : Fuel and energy related activities not included in Scope 1 or 2	• Energy consumptions from electricity and steam use	• Emission factor per energy input
Category 4 : Transportation and delivery (upstream)	• Energy consumption at each delivery center	• Emission factor per energy input
Category 5 : Waste generated in operations	• Volume of waste by type	• Emission factor by type of waste
Category 6 : Business travel	• Number of employees	• Emission factor per number of employees
Category 7 : Employee commuting	-	-
Category 8 : Leased assets (upstream)	-	-
Category 9 : Transportation and delivery (downstream)	-	-
Category 10 : Processing of sold products	-	-
Category 11 : Use of sold products	-	-
Category 12 : End-of-life treatment of sold products	• Volume of waste by type	• Emission factor by type of waste
Category 13 : Leased assets (downstream)	-	-
Category 14 : Franchises	• Electricity consumptions	• Emission factor per electricity use
Category 15 : Investments	-	-

Contact

Climate Change Policy Division, Global Environment Bureau,
Ministry of the Environment, Government of Japan

Tel: +81-(0)3-3581-3351

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Published in March, 2015