Explanations by Industry (Logistics Industry) for the Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain, Ver. 1.0 (Draft)

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Ministry of the Environment

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Part 1. Basic Approach of Accounting

1. Background and role of this document

1.1 Background

Presently 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 (hereinafter referred to as the "Accounting and Reporting System") based on the Act on Promotion of Global Warming Countermeasures (hereinafter referred to 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 the spread of products that save energy and have 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 this may involve a great deal of potential for reducing emissions, when companies determine only their own emissions, the potential for such reduction is not clarified 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 (hereinafter referred to as "supply chain emissions").

Consequently, a decision was made to develop accounting guidelines for supply chain emissions in Japan in order to promote efforts to manage supply chain emissions by providing supply chain emissions accounting methods that are easy for Japanese companies to use.

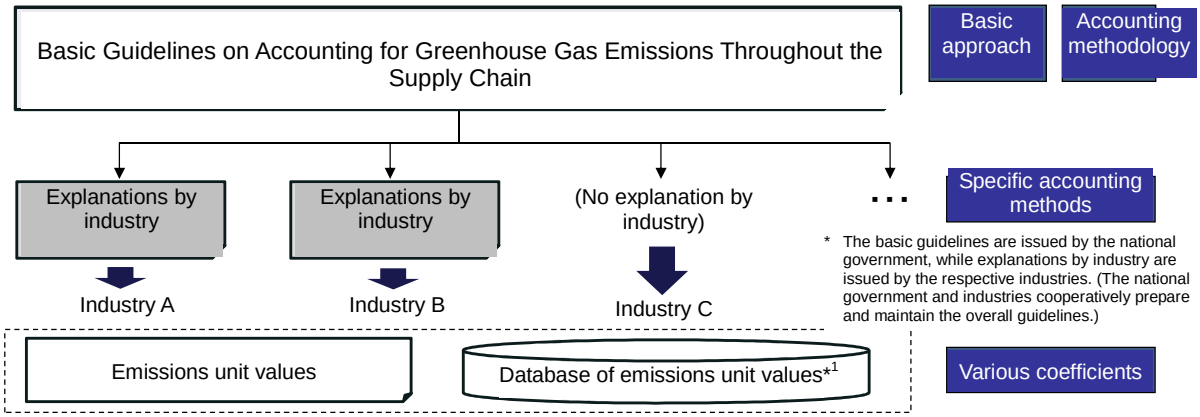
1.2 Role

This document constitutes a portion of the supply chain emissions accounting guidelines to be developed in Japan. It provides explanations for the logistics industry, based on the Basic Guidelines which are intended for all industries. This document has been prepared on the basis of the Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain, Ver. 1.0 (March 2012).

It describes the scope of emissions accounting by the logistics industry, accounting methods for use by this industry, and important points for consideration with regard to accounting, including specific examples.

For the overall structure of the guidelines and the role of this document, please refer to the figure below. Although the explanations by industry are generally prepared by the respective industries, this document has been prepared by the national government

(Ministry of the Environment) with input from businesspersons who participated in the working group.



Note 1: These guidelines indicate related emissions unit values, but each company may decide whether to use them or not.

Fig. 1.2-1. Overall structure of the guidelines and role of this document

1.3 Preparation of this document

This document was studied and prepared by the following participants in the Logistics Working Group (WG) under the Study Group on Greenhouse Gas Emissions in the Supply Chain, established by the Ministry of the Environment and the Ministry of Economy, Trade and Industry.

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- Ministry of Economy, Trade and Industry
- Ministry of Land, Infrastructure and Transport
- Japan Federation of Freight Industries

[Secretariat]

- Ministry of the Environment

1.4 Relationship between the logistics industry and supply chain emissions

This document covers supply chain emissions from the standpoint of the logistics industry. The supply chain in the general sense starts with the procurement of raw materials for goods manufactured by a shipper company and ends with transportation of those goods to consumers, and the scope of supply chain emissions also includes the use and disposal of

those goods. Meanwhile, from the standpoint of the logistics industry, the scope of supply chain emissions consists of the stages from procurement of raw materials for logistics services to provision of logistics services by a logistics company, and after the provision of services, it also includes the use and disposal of packaging materials added by the logistics company.

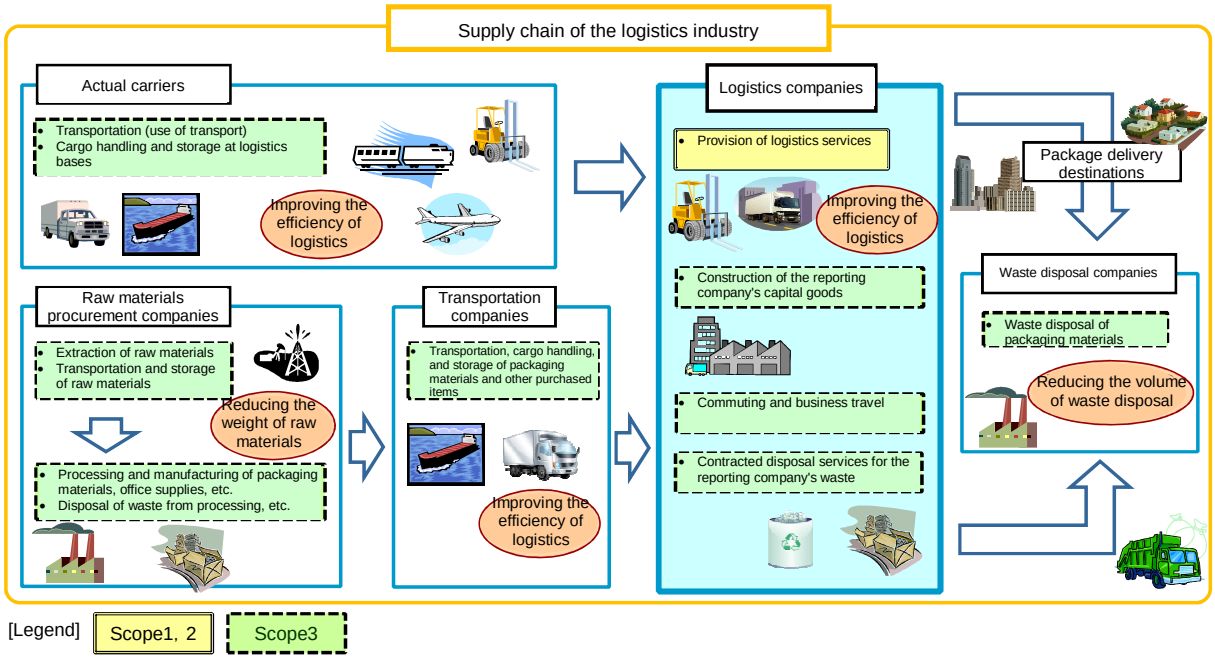


Fig. 1.4-1. Supply chain emissions of the logistics industry

The logistics industry has already been working to reduce the greenhouse gas emissions of means of transportation such as company-owned vehicles, logistics bases such as warehouses, and so on, based on legislation such as the Global Warming Countermeasures Act. However, because they play the role of connecting the supply chain through the following kinds of actions, logistics companies are also in a position to affect the overall supply chain in their relationships with shippers, actual carriers, etc.

- Selection of transportation methods: Selection of transportation modes, actual carriers, etc.
- Selection of storage methods: Selection of storage locations and warehouses, etc.
- Support for measures by actual carriers and warehouse companies: Training in environmentally friendly driving techniques, adjustment of temperature settings in warehouses, etc.
- Selection of packaging materials, etc.: Selection of materials with low environmental impact, using less packaging, using lighter-weight packaging, etc.
- Selection of methods for use of packaging materials: Efficient pallet recovery, round-trip use of containers, etc.

- Selection of disposal methods for packaging materials, etc.: Promoting reuse and recycling, etc.

- Cooperation with shippers:* Requesting measures such as less strict lead time, changes in lots, changes in transport routes, changes in temperature settings, and development of shore power equipment

- Cooperation with shipment receivers:* Requesting measures such as less strict designation of arrival time and improvement of yard conditions (such as allowing entry of large trucks)

* The logistics company requests cooperation from shippers and shipment receivers in order to reduce supply chain emissions.

In contrast to the scope previously addressed by the reporting company, such as its own vehicles, it is difficult for the reporting company to exert an influence on some portions of the supply chain because many areas are under the direct control of other parties. Still, it is expected that companies will actively endeavor to reduce emissions in the overall supply chain.

2. Use and scope of application of this document

2.1 Scope of application

This document provides explanations concerning business activities of the logistics industry. Here, the logistics industry indicates those portions of the transport industry under the Japan Standard Industrial Classification that are related to freight transport. It includes the following.

- Railway freight transport
- Road freight transport
- Water freight transport
- Air freight transport
- Warehousing
- Freight forwarding
- Harbor freight transport

This explanation is primarily written for the portions of the logistics industry that consist of freight transport using various means of transportation.

For companies that engage in business activities other than logistics, those activities are not covered by this explanation.

2.2 How to use this document

Companies should refer to both the Basic Guidelines and this document when calculating supply chain emissions. The scope of this explanation is shown in Table 2.2-1. For an explanation concerning the categories, please refer to section 4.2.

Table 2.2-1. Scope of this explanation

Division		Category	Covered in this explanation
Emissions of reporting company			
		Direct emissions (Scope 1)	Yes (1.1)
		Energy-derived indirect emissions (Scope 2)	Yes (1.2)
Other indirect emissions (Scope 3)			
Upstream	1	Purchased goods and services	Yes (2.1)
	2	Capital goods	Yes (2.2)
	3	Fuel and energy related activities not included in Scope 1 or 2	
	4	Transportation and delivery (upstream)	Yes (2.3)
	5	Waste generated in operations	Yes (2.4)
	6	Business travel	
	7	Employee commuting	
	8	Leased assets (upstream)	
Downstream	9	Transportation and delivery (downstream)	
	10	Processing of sold products	
	11	Use of sold products	
	12	End-of-life treatment of sold products	Yes (2.5)
	13	Leased assets (downstream)	
	14	Franchises	
	15	Investments	
		Other	Yes (2.6)

Note: Covered categories are identified with "Yes." Numbers in parentheses indicate the outline sections in Part 2.

For the emissions unit values needed for calculations, please refer to the "Report on Emissions Unit Values for Calculation of Greenhouse Gas Emissions, etc., by Organizations Throughout the Supply Chain" (hereinafter abbreviated as "Report on Emissions Unit Values") and the separate database of emissions unit values.

3. Purpose of accounting and using the results of accounting

The purposes of performing supply chain emissions accounting in the logistics industry may include the following.

- To obtain a deeper understanding of the current situation of the reporting company's supply chain emissions and take steps to reduce supply chain emissions.

- To obtain an indicator that can contribute to the resolution of various management issues in collaboration with actual carriers, etc., by visualizing the current state of the reporting company's supply chain, including environmental measures, cost savings, a stronger supply chain, and risk reduction.

- To find ways to reduce emissions in cooperation with shippers (customers), shipment receivers, and actual carriers, and improve communication with shippers (customers), shipment receivers, and actual carriers.

- To disclose the reporting company's emissions in order to build understanding among investors, shippers (customers), community residents, and other stakeholders.

The results of emissions accounting may be used in a variety of ways. Because many issues related to comparisons among businesses still need to be addressed, the anticipated uses at the present stage are as follows.

- Determining the scale of the reporting company's emissions and identifying areas to be targeted for reduction

- Determining changes in the reporting company's emissions over time and confirming the progress of measures taken by the company to reduce emissions

- Disclosing the reporting company's emissions to build understanding among investors, shippers (customers), community residents, and other stakeholders

It is important to address this in a stepwise manner according to the purpose and use, such as proceeding in the order of the items listed above.

Concerning the first and second points above, it is anticipated that various insights that can be used in measures for reducing emissions will be gained not only from the results of accounting but also through the accounting process.

Changes in the scale of a company's business, such as increases in the amount of freight handled, and other factors can lead to changes in supply chain emissions. One way to evaluate progress in efforts to control emissions in a way that is commensurate with a company's growth would be to evaluate emissions in terms of unit values, in addition to simply looking at total emissions.

The indices to be used for this purpose should be established in accordance with their purpose and the actual business circumstances. For example, the following methods could be used, although it may not be possible to use uniform indices for all cases.

Table 3.1-1. Indices of supply chain emissions for progress management (examples)

Example of evaluation index	Advantages	Disadvantages
GHG emissions / Sales volume	Suitable for evaluating management efficiency. Consistent with the approach that the scope of accounting is the scope recorded as sales.	Sales volumes tend to fluctuate based on commodity prices, economic conditions, etc.
GHG emissions / ton-kilometers transported	Suitable for evaluating efficiency of energy consumption (GHG emissions) per amount of transport activity.	Not well suited to quantifying some aspects of transport activity, such as wastes from operations, capital goods, and purchased products.
GHG emissions / Quantity of freight handled	Suitable for evaluating management efficiency in cases where there is a limited number of types of service and the amounts handled can be determined in terms of consistent units.	Not well suited to expressing the amounts handled if there is a wide range of products.

4. Scope of accounting

4.1 Organizational boundaries

As a general rule, the organizational boundaries for accounting by a reporting company consist of all business activities owned or controlled by the reporting company, including those of the reporting company (corporation, etc.) and companies subject to consolidation.

4.2 Activities subject to accounting

The activities subject to accounting as supply chain emissions are classified under the following three general scopes, and Scope 3 is further subdivided into fifteen categories.

Scope 1: Direct greenhouse gas emissions by the reporting company itself.

Scope 2: Indirect emissions from the use of electricity, heat, or steam supplied by others.

Scope 3: Other indirect emissions besides Scope 2 (Emissions by others related to the company's activities).

The content of each category is as follows. The explanations given in the Basic Guidelines have been partially revised for the logistics industry.

Table 4.2-1. Categories

Division		Category	Activities subject to accounting
Emissions of reporting company			
		Direct emissions (Scope 1)	Direct emissions from the use of fuel in the reporting company's vehicles and logistics bases and coolant leakage at warehouses
		Energy-derived indirect emissions (Scope 2)	Indirect emissions from the use of electricity and heat purchased at the reporting company's logistics bases and offices
Other indirect emissions (Scope 3)			
Upstream	1	Purchased goods and services	Emissions from activities up to the provision of services such as contracted transportation with freight carrier services purchased by the reporting company or manufacturing of goods such as packaging materials and office supplies
	2	Capital goods	Emissions from construction and manufacturing of the reporting company's capital goods (vehicles, logistics bases, and facilities and equipment therein)
	3	Fuel and energy related activities not included in Scope 1 or 2	Emissions from procurement of fuel used in power generation, etc., for electricity and heat procured from other companies (excluding indirect fuel emissions included in Scopes 1 and 2 and indirect fuel emissions at power plants due to the use of electricity)
	4	Transportation and delivery (upstream)	Emissions from distribution of packaging materials, office supplies, etc., up to delivery to the reporting company
	5	Waste generated in operations	Emissions from transportation and processing of waste generated by the reporting company's logistics bases, etc.
	6	Business travel	Emissions from business travel by employees
	7	Employee commuting	Emissions from transportation of employees when commuting to and from the place of business

	8	Leased assets (upstream)	Emissions from operation of assets (such as vehicles and forklifts) leased to the reporting company (excluded if calculated under Scope 1 or 2)
Downstream	9	Transportation and delivery (downstream)	(Emissions from transport, storage, cargo handling, and retail sales of sold products (excluding cases where transportation, etc., of such products is performed by the reporting company))
	10	Processing of sold products	(Emissions from processing of intermediate products by companies to whom such products are sold)
	11	Use of sold products	(Emissions from use of services by users [consumers])
	12	End-of-life treatment of sold products	Emissions when parties who have received deliveries perform transportation and processing of packaging materials purchased by the reporting company
	13	Leased assets (downstream)	(Emissions from operation of assets leased to others)
	14	Franchises	(Scope 1 and 2 emissions from franchise members [e.g., freight handling establishments operated in franchise chains])
	15	Investments	(Emissions from operation of investments)
		Other	Emissions from use of cargo handling equipment owned by other parties in harbor freight transportation business, etc.

Decisions as to which scope to select for accounting are made on reasonable grounds in accordance with the business format of each company and the purpose of accounting, etc. There may be various purposes of accounting, including reduction of supply chain emissions, use as an indicator for the resolution of important management issues (e.g., cost savings and risk reduction), and use in communication to promote collaboration with shippers (customers), shipment receivers, and actual carriers, etc., for the reduction of emissions. The table below identifies the categories that are considered advisable for priority determination in the case of the logistics industry in relation to the most fundamental purpose, that of reducing supply chain emissions.

The scope of accounting in this explanation has been set with consideration for the relative priority of each category when the purpose is reduction of supply chain emissions, as well as the unique characteristics of the logistics industry (need for explanations in relation to the Basic Guidelines). (See Table 2.2-1.)

Table 4.2-2. Scope for priority determination by the logistics industry and relationship to the logistics industry

Division		Category	Relationship to logistics industry	Priority level (examples)
Emissions of reporting company				
Direct emissions (Scope 1)			Emissions from vehicles and logistics bases; directly manageable by energy conservation, etc.	S
Energy-derived indirect emissions (Scope 2)			Emissions at logistics bases and offices; directly manageable by saving electricity, etc.	S
Other indirect emissions (Scope 3)				
Upstream	1	Purchased goods and services	Emissions of contractors and suppliers; addressable by working with contractors of transportation services, etc., for measures such as energy conservation and green procurement.	A
	2	Capital goods	Emissions by suppliers of capital goods; addressable through selection of vehicle types, materials, construction methods, etc.	B
	3	Fuel and energy related activities not included in Scope 1 or 2	Upstream emissions by electric power companies, etc.; somewhat addressable through selection of suppliers for electricity, etc.	B
	4	Transportation and delivery (upstream)	Emissions by freight shipping companies due to transportation of purchased packaging materials, etc.; addressable through optimization of ordering methods, selection of transport companies, etc.	B
	5	Waste generated in operations	Emissions by waste disposal operators; addressable through optimization of waste separation and processing methods	B
	6	Business travel	Emissions by passenger transportation companies; may be addressable through selection of means of transportation, etc., depending on the routes.	C
	7	Employee commuting	Emissions by employees (or passenger transportation companies); may be addressable through selection of means of transportation, etc., depending on the routes.	C
	8	Leased assets (upstream)	(In some cases) Emissions by leasing companies; may be addressable by optimizing usage methods of leased assets.	C
Downstream	9	Transportation and delivery (downstream)		–
	10	Processing of sold products		–
	11	Use of sold products		–
	12	End-of-life treatment of sold products	Emissions by waste disposal operators; addressable by selecting reusable packaging materials and using less packaging, etc.	B
	13	Leased assets (downstream)		–
	14	Franchises		–
	15	Investments		–
		Other	Other measures, such as efficient use of cargo handling equipment in harbor freight transport.	Voluntary

Legend:
S: Category that should be the highest level of priority in accounting by logistics companies.
A: Category that can be determined at the logistics company's own responsibility and should be an accounting priority because there is significant potential for active measures to reduce emissions.

B: Category that is desirable to include in accounting although determination may be difficult, because there is significant potential for future determination and reduction efforts based on further study of accounting methods; or a category that can be determined but is not a high priority for accounting because there is low potential for reduction.
C: Category that is a low priority for accounting because determination and management is difficult at the present time.
-: No applicable activities exist.

* Priority items for accounting should be selected on reasonable grounds, as the areas of importance will vary depending on the types of services provided and business formats.

Part 2 Explanations of Accounting Methodology

1. Reporting company's emissions

1.1 Direct emissions (Scope 1)

1.1.1 Scope of accounting

[Approach in the Basic Guidelines]

Scope 1 covers emissions from domestic and foreign business operations owned or controlled by the reporting company, and accounts for direct emissions including emissions from the use of fuel and industrial processes. When seen in terms of the company alone, Scope 1, combined with Scope 2, which is described in section 1.2, has similar coverage to the Accounting and Reporting System under the Global Warming Countermeasures Act. (In cases of accounting for supply chain emissions under these guidelines, companies subject to consolidation are also included within the scope of accounting of the reporting company.)

However, there are also some emissions activities that go beyond the scope of accounting under the Accounting and Reporting System. These can be voluntarily calculated under supply chain emissions accounting.

The Accounting and Reporting System excludes emissions from the use of construction machinery at construction sites, as well as emissions from the use of company-owned passenger cars at companies other than transportation companies. However, all emission activities related to the reporting company's activities are included in the scope of supply chain emissions accounting, so those emissions are also covered in Scope 1.

[Basic approach in the logistics industry]

In the logistics industry, emissions from domestic and foreign business operations owned or controlled by the reporting company include all uses of city gas and LPG at logistics bases and offices, etc., uses of diesel and heavy oil in transport by company-owned means of transportation such as vehicles and ships, uses of diesel and LPG in cargo handling equipment, and uses of gasoline in company-owned vehicles.

In cases where the reporting company uses a cargo handling facility, warehouse, or building as a tenant under a lease agreement, the scope is as follows, based on the owner/tenant approach under the Energy Conservation Act and the Accounting and Reporting System.

- All emissions from portions used exclusively by the tenant (within leased spaces)

* Emissions from common portions (such as common kitchenettes) are not included.

Cases where the reporting company rents a portion of a cargo handling facility, warehouse, or building to tenants as the owner are also subject to the owner/tenant approach under the Accounting and Reporting System and the Energy Conservation Act, with the following scope of accounting.

- Scope of energy management authority

Because city gas, LPG, kerosene, and the like are purchased directly by users from suppliers, it is unlikely that double counting would arise between the owner and tenants; but if double counting occurs, it should be accepted as long as there is no double counting within the reporting company's own emissions. Double counting of the reporting company's own emissions, or internal double counting, occurs when the owner/tenant approach is applied between the reporting company and other entities included within its organizational boundaries (such as subsidiaries) and the same emissions sources are subject to accounting by both parties. In such cases, double counting can be avoided by determining the amount of combined emissions for the owner and tenants.

Table 1.1-1. Scope of owner and tenant accounting in Scope 1

Category	Owner	Tenant
Common portions	Yes	No
Exclusive portions	Partial (only equipment under the owner's energy management authority)	Yes

Internal double counting* is eliminated.

* Internal double counting refers to cases where the same emissions sources are subject to accounting by both the reporting company and other entities included within its organizational boundaries (such as subsidiaries).

Emissions from activities that are not specified in the Accounting and Reporting System may also be included in accounting. For the logistics industry, a typical activity in this area would be emissions from the use of coolant in company-owned warehouses and refrigerated trucks, etc., and it is considered desirable to determine such emissions.

Specific examples of included emissions are shown below. As a general rule, all of these are to be included. However, emissions may be excluded based on clearly expressed criteria, such as cases where accounting would be difficult or the amount of emissions is sufficiently small.

[Examples of included uses of energy]

- Use of fuel and raw materials at logistics bases and offices, etc.: City gas, LPG, kerosene, etc.
- Use of fuel in transport by company-owned means of transportation such as vehicles and ships: Diesel, heavy oil, etc.
- Use of fuel in cargo handling equipment: Diesel, LPG, etc.
- Use of fuel in company-owned vehicles: Gasoline, etc. (beyond the scope of the Accounting and Reporting System)

[Examples of other included emissions]

- Use of dry ice: CO_2
- Processing of sewage, human excreta, etc.: CH_4, N_2O
- Beginning use, usage,* maintenance, and disposal of commercial freezer, refrigerator, and air conditioning equipment: HFCs

* We recommend accounting for usage beyond the scope of the Accounting and Reporting System.

1.1.2 Accounting methodology

[Approach in the Basic Guidelines]

(1) Accounting methods

Calculations are performed according to the methods of the Accounting and Reporting System as shown below.

When accounting for emissions activities that are not included in this system, calculations should be performed using actual measurements and emissions accounting methods recognized in Japan and overseas, such as methods used in the National Greenhouse Gas Inventory of Japan and the IPCC Guidelines.

At the present time, the following calculation methods may be used for emissions due to leakage during use of coolant in freezer, refrigerator, and air conditioning equipment.

- For cases where the amount of leakage in ordinary use is determined from the amounts filled and recovered during maintenance:

  CO_2 emissions = Σ { (Amount of coolant used to fill operating equipment during the emissions accounting period – Amount of recovery and appropriate disposal) x Global warming coefficient } (I-1)

- For cases where the amount of leakage in ordinary use is determined from the leakage rate:

  CO_2 emissions = Σ [{ (Amount of coolant contained in operating equipment during the emissions accounting period x Emissions unit value during use *(see below)) – Amount of recovery and appropriate disposal} x Global warming coefficient] (I-2)

[Basic approach in the logistics industry]

(1) Accounting methodsThe approach is the same as that of the Basic Guidelines. The amount of fuel used in transport may be calculated according to the fuel consumption method or revised ton-kilometer method indicated in Category 4 of the Basic Guidelines; however, for the amount of fuel used in transport by company-owned means of transportation such as vehicles and ships, the fuel method should be used because it is basically possible for the reporting company to directly determine the amounts of fuel used.

* In cases where biofuels are used, please separate out the amount of fossil fuels used in the mix, and account for that portion. (Emissions from the biofuel portion are considered to be zero.)

When accounting for HFC leakage during the ordinary use of coolant in company-owned warehouses and refrigerated trucks, etc., companies should refer to the accounting method stated above for emissions due to leakage during use of coolant in freezer, refrigerator, and air conditioning equipment.

For emissions unit values, please refer to the Report on Emissions Unit Values.

1.2 Energy-derived indirect emissions (Scope 2)

1.2.1 Scope of accounting

[Approach in the Basic Guidelines]

Scope 2 covers emissions from the use of heat and electric power purchased by the reporting company in Japan and overseas. Along with Scope 1 as described in section 1.1, it has generally similar coverage to that of the Accounting and Reporting System under the Global Warming Countermeasures Act.

[Basic approach in the logistics industry]

In the logistics industry, emissions from the use of heat and electric power purchased by the reporting company in Japan and overseas include all uses of heat and electricity in logistics bases, offices, vehicles, cargo handling equipment, etc.

In cases where the reporting company uses a cargo handling facility, warehouse, or building as a tenant under a lease agreement, the scope is as follows, based on the owner/tenant approach under the Energy Conservation Act and the Accounting and Reporting System.

- All uses of heat and electricity in portions used exclusively by the tenant (within leased spaces)

* Emissions from use of heat and electricity in common portions (such as toilets, corridors, and kitchenettes) are not included.

Cases where the reporting company rents a portion of a cargo handling facility, warehouse, or building to tenants as the owner are also subject to the owner/tenant approach under the Energy Conservation Act and the Accounting and Reporting System, with the following scope of accounting.

- Scope of energy management authority

Here, the scope is established on the basis of double counting between the owner and tenants under the Energy Conservation Act and the Accounting and Reporting System. If air conditioning, lighting, etc., are under the energy management authority of the owner, and the owner receives energy and then supplies that energy to exclusive tenant portions, either in the form of energy or as services using energy (such as air conditioning and lighting), it is accounted for by both sides. When this sort of double counting occurs, it should be accepted as long as there is no double counting within the reporting company's own emissions. Double counting of the reporting company's own emissions, or internal double counting, occurs when the owner/tenant approach is applied between the reporting company and other entities included within its organizational boundaries (such as subsidiaries) and the same emissions sources are subject to accounting by both parties. In such cases, double counting can be avoided by determining the amount of combined emissions for the owner and tenants.

Table 1.2-1. Scope of owner and tenant accounting in Scope 2

Category	Owner	Tenant
Common portions	Yes	No
Exclusive portions	Partial (only equipment under the owner's energy management authority)	Yes

Internal double counting* is eliminated.

* Internal double counting refers to cases where the same emissions sources are subject to accounting by both the reporting company and other entities included within its organizational boundaries (such as subsidiaries).

Specific examples of included emissions are indicated below. As a general rule, all of these are to be included. However, emissions may be excluded based on clearly expressed criteria, such as cases where accounting would be difficult or the amount of emissions is sufficiently small.

[Examples of included uses of purchased heat and electricity]

- Use of heat and electricity at logistics bases and offices, etc.
- Use of electricity in railway freight transportation
- Use of electricity by cargo handling equipment
- Use of electricity in electric vehicles for business purposes, if this is not included in the electricity used at logistics bases and offices subject to accounting
- Use of heat and electricity at short-term rental facilities such as event venues (beyond the scope of the Accounting and Reporting System)
- Use of electricity in company-owned vehicles, if this is not included in the electricity used at logistics bases and offices subject to accounting (beyond the scope of the Accounting and Reporting System)

2. Other indirect emissions (Scope 3)

2.1 Category 1: Purchased goods and services

2.1.1 Scope of accounting

[Approach in the Basic Guidelines]

The scope of accounting for Category 1 consists of emissions from the stage of resource extraction to the stage of manufacturing for all goods (raw materials, parts, purchased items, sales-related materials, etc.) and services purchased or acquired by the reporting company. Goods and services indicate all raw materials, parts, products, and services, etc., brought into the reporting company, including the types indicated below; however, goods and so on that are not directly purchased by the reporting company and are beyond its control may be excluded from accounting. Transportation from the stage of resource extraction to the primary supplier is also included in Category 1. (However, transportation from the primary supplier to the reporting company falls under Category 4.)

- Raw materials, intermediate products, and final products purchased or acquired by the reporting company (including purchased items)
- Software and other services purchased or acquired by the reporting company

[Basic approach in the logistics industry]

In the logistics industry, this category covers emissions from services of the reporting company's business activities that are outsourced, and emissions from the stage of resource extraction to the stage of manufacturing for all goods that are directly purchased, used, or leased by the reporting company. Here, distribution as an outsourced service that does not constitute a portion of services sold to customers (such as distribution for procurement of purchased goods) is included in Category 4. Outsourcing related to the purchasing of capital goods is included in Category 2. Emissions from the use of energy and raw materials, etc., in other outsourced services (such as outsourced repair and maintenance services) are included in Category 1.

Specific examples of included goods and services are described below. As a general rule, all of these are to be included. However, emissions may be excluded based on clearly expressed criteria, such as services where accounting would be difficult and goods where the amount handled is sufficiently small.

[Examples of included services]

- Contracted transportation using freight carrier services (truck, railway, ship, or aircraft)
- Outsourced repair and maintenance services for vehicles and logistics bases owned by the reporting company
- Outsourced distribution processing work
- Cargo handling and storage at external logistics bases (such as cargo handling facilities at warehouses and airports)

- Contracted transportation to harbor freight transportation services

[Examples of included goods]

- Purchased items for use by the reporting company:

  ➢ Packaging materials used in the reporting company's business activities (cardboard, pallets, stretch film, etc.)

  ➢ Office supplies, OA equipment, paper, and other items used in offices

  ➢ Slips for shipping documentation

  ➢ Wheeled cages, hand-held terminals, and other logistics equipment (excluding fixed assets)

  * Even when goods are loaned or provided free of charge to agencies and the like, they are included if they are provided as a part of the reporting company's business activities.

2.1.2 Accounting methodology

[Approach in the Basic Guidelines]

(1) Accounting methods

There are two methods of accounting:

[1] Determining emissions for goods and services purchased or acquired by the reporting company from the stage of resource extraction to the stage of manufacturing for each supplier and combining these amounts.

[2] Determining data on volume and monetary amounts for goods and services purchased or acquired by the reporting company and multiplying those figures by emissions unit values from the stage of resource extraction to the stage of manufacturing for the respective goods and services.

Accounting method 1 provides a high level of accounting accuracy, but cannot be easily used in cases where suppliers cannot determine emissions data or emissions data cannot be obtained from suppliers.

Accounting method 2 uses data on physical amounts and monetary values for goods and services purchased or acquired by the reporting company, so accounting is relatively easy. However, since accounting is performed by multiplying data on physical amounts and monetary values for goods and services purchased or acquired by the reporting company and emissions unit values from the stage of resource extraction to the stage of manufacturing, the accuracy of accounting depends on how well the categories of data on physical amounts and monetary values determined by the company match up with the categories of the emissions unit values used.

[Basic approach in the logistics industry]

(1) Accounting methods

Two types of emissions are subject to accounting under this category in the logistics industry: These are emissions from services of the reporting company's business activities that are outsourced, and emissions from the stage of resource extraction to the stage of manufacturing for all goods that are directly purchased, used, or leased by the reporting company.

When determining emissions from outsourced services of the reporting company's business activities (such as transport, cargo handling, and storage), this includes only the Scope 1 and 2 emissions of contractors (mainly from the use of fuel) and emissions from the manufacturing of goods directly involved in the services provided. Not only direct emissions during the combustion of fuel, but also the emissions of such fuel on a life cycle basis (including emissions from fuel extraction) may be included in these figures.

Because many companies have access to some amount of data on the amounts of fuel used in their transportation, logistics bases, and other facilities, this can be checked by the method of determining the amounts of emissions of each supplier (or contractor) and adding those up (using the approach of accounting method 1).

Meanwhile, accounting method 2 can be used for other activities, because in many cases it would be difficult to use accounting method 1. In cases where it is possible to separate out a portion of emissions that can be determined using accounting method 1, both accounting method 1 and accounting method 2 are used in combination.

For emissions unit values, please refer to the Report on Emissions Unit Values.

[1] Calculation of emissions from outsourced services of the reporting company's business activities

In the area of outsourced services, emissions from contracted transportation services are calculated by the fuel method, the fuel consumption method, or the ton-kilometer method. A reporting company may use emissions unit values based on the life cycle emissions of fuel, instead of direct emissions during fuel combustion.

[Fuel method]

CO_2 emissions = Σ {Amount of fuel usage x Emissions unit value (= Unit calorific value x Emission coefficient x 44/12)} (a)

[Fuel consumption method]

CO_2 emissions = Σ {Operating distance / Fuel consumption x Emissions unit value (= Unit calorific value x Emission coefficient x 44/12)} (b)

[Ton-kilometer method:]

CO_2 emissions = Σ {Weight of cargo x Transport distance x Emissions unit value (= Unit calorific value x Emission coefficient x 44/12)} (c)

For outsourced distribution services other than transportation services, emissions are calculated using emissions unit values and the amounts of electricity and fuel used at logistics bases and warehouses. For more information concerning this

approach, please refer to Category 4 of the Basic Guidelines. In the case of long-term storage facilities such as warehouses, the length of the storage period affects the amount of emissions; so in cases where it is only possible to determine the total emissions from combined use of a warehouse by multiple parties, such emissions should be allocated with consideration for the storage periods. For example, the total emissions could be first allocated by the number of days of storage, and then allocated by the proportion of area or capacity used during that period.

[2] Emissions from all goods that are directly purchased, used, or leased by the reporting company

Emissions are calculated by multiplying the amounts or value of purchased goods by an emissions unit value (going back to the stage of resource extraction).

(2) Amount of activity to be determined

[1] Calculation of emissions from outsourced services of the reporting company's business activities

With regard to contracted transportation services, the amount of activity to be determined is the amount of fuel used in the case of the fuel method, the number of hired vehicles and operating distance per vehicle in the case of the fuel consumption method, and the cargo weight and transport distance in the case of the ton-kilometer method.

With regard to outsourced distribution services other than transportation services, in addition to the amounts of electricity and fuel used at logistics bases and warehouses, emissions can also be allocated by determining the contract fees, area used, amount stored, etc., in cases where only a portion corresponds to the reporting company.

[2] Emissions from all goods that are directly purchased, used, or leased by the reporting company

In addition to the amount or value of purchased goods, data such as the materials of goods can be determined. If the units are determined in accordance with the categories of emissions unit values, this data can be used in calculating emissions.

For example, the emissions unit values (value-based) that correspond to categories of the correspondence table by industry include unit values for cardboard boxes, plastic products, and pens & stationery.

The following are examples of calculations for contracted transportation services. There is an example for highway transportation and another for delivery.

[Example 1] Estimation of contracted highway transportation emissions based on the number of trips between bases and distance between bases

Here, emissions are calculated by the fuel consumption method, using standard fuel consumption and records of contracted transportation by truck among bases A, B, and C.

(1) Determining operating distance of contracted transportation services among bases

Determination is based on transport distance between bases and records of the number of trips among bases by type of vehicle. Here, it is assumed that only three types of trucks were used: 4-ton, 10-ton, and trailer trucks.

Distance between bases

	A	B	C
A		100 km	125 km
B	100 km		169 km
C	125 km	169 km	

×

Number of trailer truck trips between bases

Number of 10-ton truck trips between bases

Number of 4-ton truck trips between bases

	A	B	C
A		324	521
B	295		148
C	488	86	

Type of vehicle	Total for fiscal year	
	Number of trips	Operating distance (km) [1]
4-ton truck	1,025,585	330,870,255
10-ton truck	3,160,080	715,225,159
Trailer truck	300,500	50,586,129

(2) Fuel consumption figures

Fuel consumption is determined for each type of vehicle. If records are not available, the fuel consumption figures under the Energy Conservation Act (for shippers) and the Accounting and Reporting System* are used.

* Please refer to the Greenhouse Gas Emissions Accounting and Reporting Manual, Ver. 3.3 (May 2012).

(http://ghg-santeikohyo.env.go.jp/manual)

Type of vehicle	Fuel consumption (diesel)	
	Maximum loading weight (kg)	Fuel consumption (km/l) [2]
4-ton truck	2,000～3,999	4.58
10-ton truck	8,000～9,999	3.09
Trailer truck	12,000～16,999	2.62

(3) Calculation of emissions

The amounts of emissions are determined by dividing the operating distance by fuel consumption and multiplying by unit calorific value and an emission coefficient.

Type of vehicle	Operating distance (km) [1]	Fuel consumption (km/l) [2]	Diesel calorific value and emission coefficient		Emissions (tCO_2) [1] / [2] / 1000 x [3] x [4] x 44/12
			Unit calorific value (GJ/kl) [3]	Emission coefficient tC/GJ [4]	
4-ton truck	330,870,255	4.58	37.7	0.0187	186,744
10-ton truck	715,225,159	3.09	37.7	0.0187	598,327
Trailer truck	50,586,129	2.62	37.7	0.0187	49,910

Note: All of the figures given here are merely examples for explanatory purposes. Please be sure to use the latest figures for emission coefficients, unit calorific values, etc.

[Example 2] Calculation of contracted delivery transportation emissions based on emissions per item within a specified region

Although it is preferable to determine these figures for all of Japan to use in calculations, the fact is that in some cases, only a portion of such data can be determined. In such cases, the calculation method is to determine the amount of emissions per delivered item from the delivery records of contractors in a specified region and use those figures to estimate nationwide emissions.

(1) Calculation of emissions per delivered item from the delivery records of contractors within a specified region

In a region where data is available, samples are selected in units of trucks or contractors, and the fuel usage and delivery records of those contractors are confirmed. These figures are used to calculate emissions per delivered item.

No.	Transport distance (km)	Fuel usage (l)	Quantity delivered (items)	CO_2 emissions (kg-CO_2/day)	CO_2 emissions per item (g-CO_2/item)
1	38.80	3.56	99	8.25	83.38
2	21.49	1.97	116	4.57	39.41
3	43.14	3.96	53	9.18	173.17
…					…

Average → 57.2 g-CO_2/item

(2) Estimation of nationwide emissions

Carbon dioxide emissions from nationwide contracted delivery services are estimated on the basis of the quantity of items delivered nationwide by contractors and the amount of carbon dioxide emissions per item. Here, it is assumed that the quantity of items delivered nationwide by contractors is 128,589,221 items per year.

128,589,221 items x 57.2 g-CO_2/item = 7,355 tCO_2

Note: All of the figures given here are merely examples for explanatory purposes. Please be sure to use the latest figures for emission coefficients, unit calorific values, etc.

Last, the following is an example of calculating emissions from outsourced repair services.

[Example 3] Calculation of emissions from outsourced repair services based on contract fees

Although it is desirable to determine all of the details of services included in outsourced repair services, the fact is that in some cases, the only data available is the monetary amount charged for such services. In such cases, it is possible to estimate emissions on the basis of data on contract fees and amounts of emissions in relation to contract fees.

(1) Determination of annual fees for outsourced repair services
The reporting company adds up the fees for repairs of company-owned vehicles and logistics bases. Here, we will assume the case of a company that has spent ¥5 million on repairs to its company-owned vehicles in one year.

(2) Estimation of emissions
Carbon dioxide emissions due to repairs and maintenance of company-owned vehicles and logistics bases at this company are determined on the basis of carbon dioxide emissions per unit fees for repair services (emissions unit value). For example, the following calculation applies to repairs to company-owned vehicles.

¥5 million x 2.31 tCO_2/million yen = 11.55 tCO2

* Reference: List of emissions unit values (CO_2 emissions unit values $(I\text{-}A)^{-1}$)

Automotive:	Repair of vehicles, 2.31 tCO_2/¥1 million
Ship:	Repair of ships, 4.00 tCO_2/¥1 million
Railway:	Repair of railroad cars, 4.72 tCO_2/¥1 million
Equipment:	Repair of equipment, 2.65 tCO_2/¥1 million

Source: Nansai, Keisuke and Moriguchi, Yuichi, 2010 Data Book of Environmental Impact Factors Based on the Correspondence Table by Industry (3EID): 2005 yearbook (β+ edition), National Institute for Environmental Studies, Center for Global Environmental Research (http://www.cger.nies.go.jp/publications/report/d031/index-j.html)

Note: All of the figures given here are merely examples for explanatory purposes. Please be sure to use the latest figures for emission coefficients, unit calorific values, etc.

2.2 Category 2: Capital goods

2.2.1 Scope of accounting

[Approach in the Basic Guidelines]
The scope of accounting under Category 2 consists of emissions from the construction and manufacturing of capital goods purchased or acquired during the accounting period. Capital goods are final products having a long usable lifetime, used by a company for the manufacturing of products, provision of services, or sale, storage, and transportation of goods. They are treated as fixed assets in financial accounting.

Therefore, this category includes emissions from raw material manufacturing and transport at all of the reporting company's facilities (factories, offices, stores, etc.), equipment, buildings, etc., as well as emissions during construction (including wastes). In cases of renovation of existing facilities leased from other entities as a tenant, accounting covers only the renovation portion (interior decoration, equipment, etc.).

[Basic approach in the logistics industry]

In the logistics industry, accounting covers emissions from the construction and manufacturing of all capital goods used in business activities by the reporting company. Specific examples of included capital goods are indicated below. As a general rule, all of these are to be included.

Note: It is desirable to account for the emissions of capital goods that are leased under a finance lease, because they are included as assets on the balance sheet; however, these are recorded under Category 8.

[Examples of included capital goods]

- Capital goods used for the reporting company's business activities

  ➢ Company-owned vehicles used in business activities
  ➢ Company-owned logistics bases used in business activities
  ➢ Information systems built at the reporting company
  ➢ Distribution equipment used in business activities (forklifts, containers, etc.)

- Capital goods used for other business activities of the reporting company

  ➢ Offices and other buildings used in business activities
  ➢ Facilities and equipment established in offices, etc.
  ➢ Vehicles used in operating activities

* Emissions at the stage of utilization of capital goods are not included here, since they are covered under Scopes 1 and 2. For example, if the reporting company owns a vehicle for operating activities and sales activities, Category 2 includes emissions from vehicle manufacturing and delivery of the vehicle to the reporting company (excluding cases of transport contracted by the reporting company itself, which is covered under Category 4), but emissions from use of the vehicle are included under Scope 1, as this is beyond the scope of Category 2.

2.2.2 Accounting methods

[Approach in the Basic Guidelines]
There are three methods of accounting in Category 2, as follows.
[1] Determining emissions from the stage of resource extraction to the stage of manufacturing for each capital good, and adding up these amounts.
[2] Obtaining data from capital good suppliers on Scope 1 and 2 emissions related to capital goods, weight and transport distance of raw materials, and weight of waste, etc., and adding these up for each item.
[3] Determining the weight, sale units, or amount of expenditures for purchased capital goods and estimating emissions on that basis.

[Basic approach in the logistics industry]

(1) Accounting methods

In this category, the three accounting methods listed above can be used for emissions from the construction and manufacturing of all capital goods used in a reporting company's business activities.

It is thought that accounting method 3 will generally be used when determining emissions from capital goods in the logistics industry, based on factors such as the situation of data availability. The following approaches are used when calculating emissions from company-owned vehicles and company-owned logistics bases, which are particularly numerous in the logistics industry.

[1] Company-owned vehicles

Emissions from company-owned vehicles are calculated from the purchased quantity and purchase price for each vehicle type and the corresponding emissions unit values.

[2] Company-owned logistics bases

Emissions from company-owned logistics bases are calculated from the types and quantities of materials used in construction, site area, and investment amount, and the corresponding emissions unit values.

For emissions unit values, please refer to the Report on Emissions Unit Values.

(2) Amount of activity

[1] Company-owned vehicles

For company-owned vehicles, the purchased quantity and purchase price are determined for each vehicle type. Concerning the categories of vehicle types, for example, emissions unit values have been prepared in the categories of passenger cars, trucks & buses, etc., ships, and other transportation equipment including

in-yard transporting vehicles and forklifts, considering the use of emissions unit values for monetary values based on the correspondence table by industry.

[2] Company-owned logistics bases

For company-owned logistics bases, the types and quantities of materials used in construction, site area, and investment amount are determined.

2.3 Category 4: Transportation and delivery (upstream)

2.3.1 Scope of accounting

[Approach in the Basic Guidelines]
The scope of accounting under Category 4 consists of [1] Emissions from distribution (transport, cargo handling, and storage) of goods and services purchased in the fiscal year subject to reporting (emissions from distribution on the upstream side of the reporting company) and [2] Other emissions from distribution services (transport, cargo handling, and storage) purchased in the fiscal year subject to reporting (distribution among the reporting company's facilities and distribution on the downstream side of the reporting company). This does not include distribution performed by the reporting company itself or emissions at the reporting company's facilities (determined under Scope 1 or Scope 2). Cargo handling and storage at pass-through logistics bases (transfer centers) such as distribution centers and cargo handling facilities where cargo is only handled briefly, as well as distribution centers that include distribution processing, may be excluded from this category.

[Basic approach in the logistics industry]

In the logistics industry, the following activities are to be included in accounting under this category. Here, accounting in this category does not include purchasing of freight carrier services as a portion of logistics services provided to customers.

[Examples of included distribution activities]

- Transportation from transaction partners (manufacturers, wholesalers, etc.) to logistics bases of the reporting company
- Storage and cargo handling at warehouses where packaging material and office supplies are stored (if these are not company-owned facilities)
- Cargo handling and storage at pass-through logistics bases (transfer centers) such as distribution centers and cargo handling facilities where cargo is only handled briefly, as well as logistics centers that include distribution processing, within the covered transport zones*
- Transportation and processing of discarded packaging materials used in the transportation of purchased goods (only for waste packaging materials that are generated in transportation processes subject to accounting, but are not covered under Category 5) *

* It is expected that such activities will be included in cases where the reporting company wishes to address a broader range of emissions.

2.4 Category 5: Waste generated in operations

2.4.1 Scope of accounting

[Approach in the Basic Guidelines]
The scope of accounting in Category 5 consists of emissions from disposal and processing of waste generated in the reporting company's business activities (excluding wastes sold for compensation) by parties other than the reporting company. It also includes emissions from the transport of waste. In-house disposal, such as recycling within the reporting company's own processes, is recorded under Scope 1.

In cases where waste is recycled, the scope of accounting needs to be cut off at a certain point. It is difficult to prescribe one specific method of demarcating this scope, but for example, the scope of accounting could be limited to emissions through the stage of preparations for recycling (transport, disassembly, crushing, and sorting); or accounting for recycling processes could be handled by either one side or the other.

[Basic approach in the logistics industry]

In the logistics industry, the scope of accounting consists of emissions from all disposal and processing of wastes generated in the reporting company's business activities (excluding wastes sold for compensation) by parties other than the reporting company. Specific examples of included wastes are indicated below. As a general rule, all of these are to be included.

[Examples of included wastes]

- Waste generated from transportation and other operating activities of the reporting company
  - ➢ Discarded company-owned vehicles
  - ➢ Discarded pallets, cardboard and other packaging materials used in business activities
  - ➢ Slips attached to cargo for shipping documentation, if discarded by the reporting company
  - ➢ Metal, plastic, and paper waste used in cargo handling equipment, etc., and racks, forklifts, and storage equipment such as containers
  - ➢ Construction waste from dismantled logistics bases, etc.
- Waste generated from other business activities of the reporting company
  - ➢ Plastic and paper waste from office supplies and other waste materials generated at offices, etc.

As the examples illustrate, this includes only wastes discarded directly by the reporting company. It does not include wastes generated by contractors of services such as repairs

and maintenance. For example, a portion of the slips attached to cargo for shipping documentation is retained by the client and the delivery destination (in the form of copies), and disposal of such slips by recipients of the company's services is not included here.

[Differences between Category 5 and Category 12 in the handling of waste]

The following is a summary of the differences between Category 5 (waste generated in the reporting company's business operations) and Category 12 (end-of-life treatment of sold products) with regard to the handling of waste.

Case [1] The logistics company consigns items purchased by itself for waste disposal (including recycling; the same applies below). Here, this includes cases where items purchased by the logistics company are removed by the logistics company itself upon delivery to a shipment receiver along with the cargo to be delivered, or upon reaching the cargo client.

Case [2] The logistics company consigns items purchased by a shipper or other cargo client for waste disposal. This includes cases where packaging material is removed and disposed of when cargo is delivered to the shipment receiver.

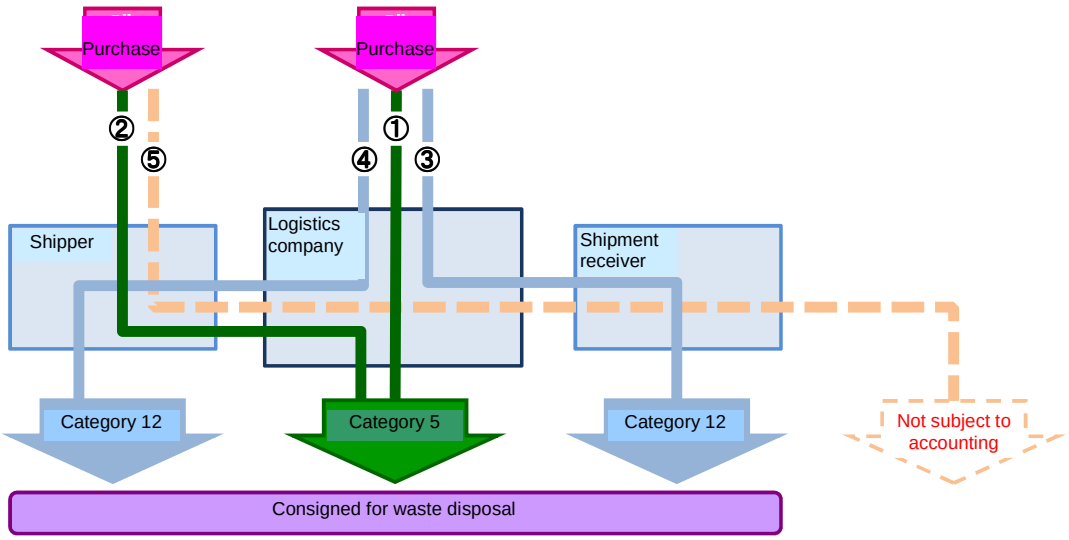
Case [3] Upon reaching a shipment receiver or other cargo delivery recipient, items purchased by the logistics company are consigned for waste disposal by the delivery recipient.

Case [4] Upon reaching a shipper or other cargo client, items purchased by the logistics company are consigned for waste disposal by the client.

Case [5] Upon reaching a shipment receiver or other cargo delivery recipient by way of the logistics company, items purchased by a shipper or other cargo client are consigned for waste disposal by the delivery recipient.

Cases [1] and [2] in the figure below correspond to Category 5. Taking the example of documentation slips, although the logistics company purchases the slips, a portion of the slips are retained and disposed of by the transportation client (Case [4]) and the delivery recipient (Case [3]), so this includes only the portion disposed of by the logistics company itself (that is, Case [1] only).

Even if the transportation client purchases packaging materials, these are included under Category 5 if the logistics company disposes them (Case [2]); however, such items are not covered under Category 5 (not subject to accounting) if the delivery recipient disposes them (Case [5]).



[Category 5]
- Waste generated in the reporting company's business activities
  - A party other than the reporting company handles disposal and processing of items purchased by the reporting company (Case [1])
  - A party other than the reporting company handles disposal and processing of items purchased upstream (Case [2])

[Category 12]
- Disposal of sold products
  - Disposal and processing of products manufactured and sold by the reporting company and their containers and packaging (Cases [3] and [4])

[Not subject to accounting]
- Delivery recipients dispose of items that were purchased upstream (Case [5])

Fig. 2.4-1. Scope of accounting for waste packaging materials, etc.

Meanwhile, the handling of waste from repairs is illustrated in Fig. 2.4-2.

First, waste generated from contracted repairs is counted as waste of the contractor (company that handled the repairs). Therefore, when repairs are outsourced, discarded tires are included under Category 1, not Category 5.

Waste from repairs is included under Category 5 if the reporting company performed the repairs and consigned the waste for disposal. For example, tires consigned for disposal are included under Category 5 if they are wastes of the reporting company.

If the reporting company itself performs waste disposal, this is included under Scope 1 or Scope 2.

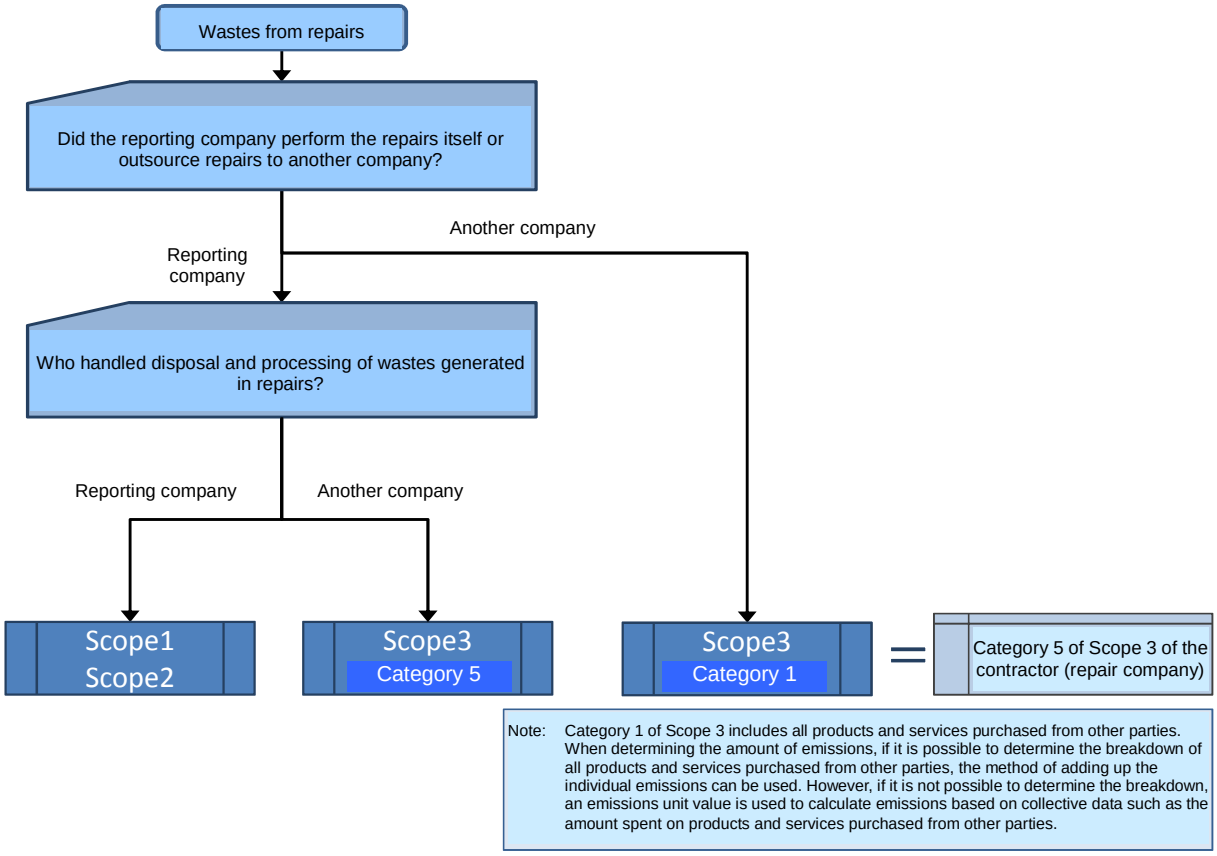


Fig. 2.4-2. Handling of waste from repairs

When disposing of company-owned vehicles, if these are traded in as used vehicles, they will not become waste until after they have been utilized as used vehicles; therefore, they are not considered wastes at the time of trade-in. This accounting is performed by the party which purchases the vehicles used and then disposes of them. Emissions from further use of vehicles after they have been sold as used vehicles (Category 11) are not subject to accounting unless the reporting company's industry is the sale of used items including logistics services.

2.4.2 Accounting methodology

[Approach in the Basic Guidelines]

In cases where actual figures on disposal and recycling (such as processing methods for each type of waste) can be determined, such amounts are multiplied by emission coefficients for the respective types of waste and processing methods.

In cases where actual figures on disposal and recycling cannot be determined (processing methods by type of waste, etc.), emissions are calculated by multiplying the fees charged by or amounts consigned to waste disposal/recycling companies by emissions unit values on the basis of standard scenarios for each type of waste.

[Basic approach in the logistics industry]

(1) Accounting methods

In the logistics industry, it is difficult to directly determine actual figures on disposal and recycling (processing methods by type of waste, etc.) of wastes generated from the reporting company's business activities. Therefore, as a general rule, accounting is performed with emissions unit values based on standard scenarios for each type of waste.

Here, we will discuss the disposal of vehicles and materials for packaging and cargo handling, which occurs frequently in the logistics industry. The approaches for these are as follows.

[1] Company-owned vehicles

For the disposal of company-owned vehicles, emissions are calculated based on the quantity of each vehicle type, fees charged by waste disposal/recycling companies, and corresponding emissions unit values.

[2] Materials for packaging and cargo handling

For the disposal of materials for packaging and cargo handling, emissions are calculated based on the amounts of waste disposal by item, fees charged by waste disposal/recycling companies, and corresponding emissions unit values.

For emissions unit values, please refer to the Report on Emissions Unit Values.

(2) Amount of activity

[1] Company-owned vehicles

For the disposal of company-owned vehicles, the amounts of activity are the quantity of each vehicle type and fees charged by waste disposal/recycling companies. If the quantity of discarded vehicles has been determined, the weights of representative types of materials by vehicle type are determined, and these are converted into amounts of waste disposal.

[2] Materials for packaging and cargo handling

For the disposal of materials for packaging and cargo handling, the amounts of activity are the amounts of waste disposal by material (item) and fees charged by waste disposal/recycling companies. If it is difficult to determine the amounts of waste disposal, another possible method would be to determine the amounts purchased and estimate the amounts of waste disposal based on the proportion discarded.

2.5 Category 12: End-of-life treatment of sold products

2.5.1 Scope of accounting

[Approach in the Basic Guidelines]
The scope of accounting under Category 12 consists of emissions from the disposal and processing of products manufactured or sold by the reporting company, as well as the containers and packaging of such products.

In cases where products are recycled, the scope of accounting needs to be cut off at a certain point. It is difficult to prescribe one specific method of demarcating this scope, but for example, the scope of accounting could be limited to emissions through the stage of preparations for recycling (transport, disassembly, crushing, and sorting); or accounting for recycling processes could be handled by either one side or the other.

[Basic approach in the logistics industry]

In the logistics industry, accounting includes emissions from the disposal of packaging materials purchased by the reporting company (the logistics company) and provided to customers, or delivery recipients.

Packaging materials used in the transportation of products may include the following. For example:

- Packaging materials around the products themselves (individual packaging added in the manufacturing process)

- Packaging used for transportation (transport packaging purchased by the logistics company itself)

Of these, packaging materials around the products themselves are not subject to accounting because they are not purchased or sold by the logistics company. However, packaging used for transportation is purchased by the logistics company itself; and in cases where it is provided to the delivery recipient, it would be considered to be provided, or sold, as a part of the transportation services, so it is subject to accounting. However, if the transportation company takes back some transport packaging materials (such as pallets) and does not leave them with the recipient, these are not included in accounting. There are also cases where the packaging materials are actually purchased by the customer, or added by the reporting company as a part of its services; and because the packaging materials are considered to be sold as a part of the reporting company's services in both of these cases, they are subject to accounting.

Based on the above, as a general rule, the following packaging materials are subject to accounting:

[Example of packaging materials subject to accounting]

- Disposal of packaging materials purchased by the logistics company itself, used in transportation, and then provided to the delivery recipient:

- ➢ Cardboard, stretch film, pallets, and other packaging materials used in transportation

[Differences between Category 5 and Category 12 in the handling of waste]

The following is a summary of the differences between Category 5 (waste generated in the reporting company's business operations) and Category 12 (end-of-life treatment of sold products) with regard to the handling of waste.

Case [1] The logistics company consigns items purchased by itself for waste disposal (including recycling; the same applies below). Here, this includes cases where items purchased by the logistics company are removed by the logistics company itself upon delivery to a shipment receiver along with the cargo to be delivered, or upon reaching the cargo client.

Case [2] The logistics company consigns items purchased by a shipper or other cargo client for waste disposal. This includes cases where packaging material is removed and disposed of when cargo is delivered to the shipment receiver.

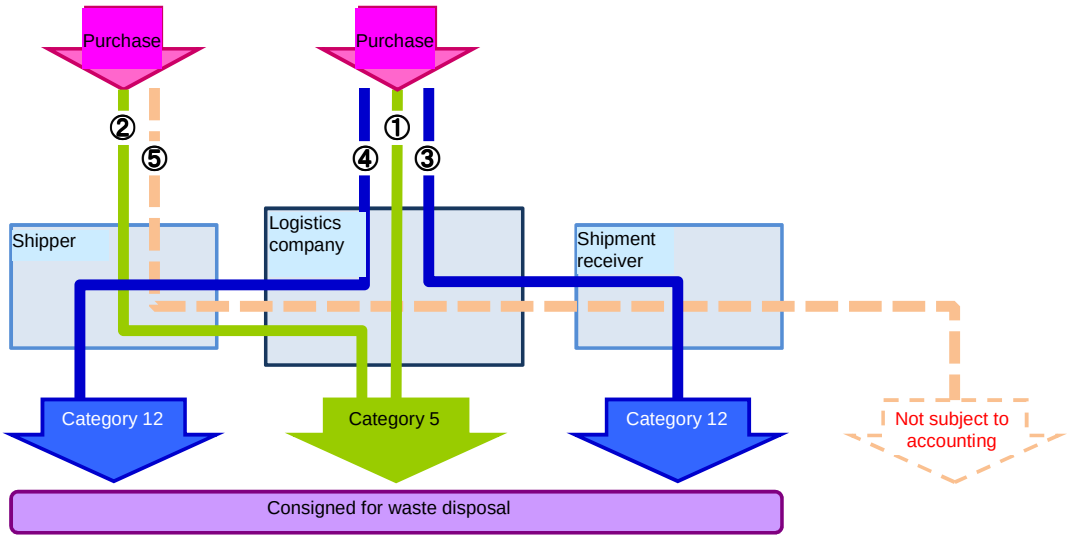
Case [3] Upon reaching a shipment receiver or other cargo delivery recipient, items purchased by the logistics company are consigned for waste disposal by the delivery recipient.

Case [4] Upon reaching a shipper or other cargo client, items purchased by the logistics company are consigned for waste disposal by the client.

Case [5] Upon reaching a shipment receiver or other cargo delivery recipient by way of the logistics company, items purchased by a shipper or other cargo client are consigned for waste disposal by the delivery recipient.

Cases [3] and [4] in Fig. 2.5-1 correspond to Category 12. Taking the example of documentation slips, in cases where the slips are purchased by the logistics company but a portion of the slips are retained and disposed of by the transportation client (Case [4]) and the delivery recipient (Case [3]), this portion is included in Category 12.

Packaging materials needed for transportation that are purchased by the logistics company, and then left with the delivery recipient (and discarded by the delivery recipient), are included under Category 12. However, such items are covered under Category 5 if they are taken away by the logistics company upon delivery.



[Category 5]
- Waste generated in the reporting company's business activities
  - A party other than the reporting company handles disposal and processing of items purchased by the reporting company (Case [1])
  - A party other than the reporting company handles disposal and processing of items purchased upstream (Case [2])

[Category 12]
- Disposal of sold products
  - Disposal and processing of products manufactured and sold by the reporting company and their containers and packaging (Cases [3] and [4])

[Not subject to accounting]
- Delivery recipients dispose of items that were purchased upstream (Case [5])

Fig. 2.5-1. Scope of accounting for waste packaging materials, etc.

2.5.2 Accounting methodology

[Approach in the Basic Guidelines]

(1) Accounting methods

In cases where actual figures on disposal and recycling (such as processing methods for each type of waste) can be determined, emissions are calculated by multiplying the amounts of waste disposal or recycling, for each type of waste and processing method, by the respective emissions unit value for each type of waste and processing method. If it is difficult to determine actual figures on disposal and recycling, emissions are estimated by multiplying the fees charged by or amounts consigned to waste disposal/recycling companies by emissions unit values on the basis of standard scenarios for each type of waste. The standard scenarios could be established with reference to processing ratios throughout Japan for each type of waste and each processing method.

(2) Amount of activity

In cases where actual figures on disposal and recycling (such as processing methods for each type of waste) can be determined, the amount of activity is the amount of waste disposal or recycling for each type of waste and processing method. In cases where it is

difficult to determine such figures, the costs of waste disposal (or amounts) and costs of recycling (or amounts) are determined as the amount of activity.

[Basic approach in the logistics industry]

(1) Accounting methods

In the logistics industry, it is difficult to determine the actual situation of disposal and recycling (such as processing methods by type of waste) of packaging materials purchased by the reporting company (the logistics company) and provided to customers, or delivery recipients. Therefore, as a general rule, the following methods are used to calculate the amounts of such waste disposal.

[1] Perform a sampling survey to determine the proportion of packaging materials that are left at the delivery destination and not removed, and then estimate the amount discarded by multiplying the amount of packaging materials purchased by the reporting company by the proportion discarded.

[2] For each type of packaging material, determine whether materials are collected from delivery destinations, and compile the results to estimate the amount discarded.

For emissions unit values, please refer to the Report on Emissions Unit Values.

(2) Amount of activity

In the logistics industry, it is difficult to determine the actual situation of disposal and recycling (such as processing methods by type of waste) of packaging materials purchased by the reporting company and provided to customers, or delivery recipients, and it is also difficult to determine waste disposal costs and recycling costs. Therefore, as a general rule, the amounts of waste disposal and amounts of recycling should be determined as the amount of activity.

The following is an example of calculating emissions from the disposal of packing slips, which are slips attached to cargo for shipping documentation.

[Example 4] Emissions from disposal of packing slips

This is a method for calculating the portion of emissions due to packing slips given to shippers and shipment receivers. Here, we are assuming a packing slip with four sheets per copy set (see table below). If each sheet is given to the respective party, only two of the four sheets will be given to the customer, and the remaining two sheets will be returned to the reporting company. In this case, the shipment receiver will dispose of two sheets.

(1) Calculating the weight of slips given to shipment senders and recipients

Structure of a packing slip (four sheets per set)			
Sheet number	Purpose	Given to	
1	Sender's copy	Sender of shipment	→ Category 12
2	Record of pickup	Kept by logistics company	→ Category 5
3	Record of shipment	Kept by logistics company	→ Category 5
4	Recipient's copy	Recipient of shipment	→ Category 12

This calculation is for Category 12 emissions, assuming that the entire set weighs 10 grams and that two of the four sheets are given to customers. The logistics company accounts for the two remaining sheets under Category 5.

10 g/set x 128,665,332 sets x 2 sheets / 4 sheets = 643,326,660 g = 643 t
Here, it is assumed that all four sheets have equal weights.

(2) Calculating the amount of emissions

The weight discarded by customers is multiplied by an emissions unit value to determine carbon dioxide emissions. Also, the entire packing slip is accounted for under Category 1.

643 t x 0.206 tCO_2/t = 132 tCO_2

Note: All of the figures given here are merely examples for explanatory purposes. Please be sure to use the latest figures for emission coefficients, unit calorific values, etc.

2.6 Other

[Approach in the Basic Guidelines]

Reporting companies may opt to use this category to account for emissions that have some relationship to their business activities but are not covered in Categories 1 to 15. For example, this could include emissions in the daily lives of employees and consumers at their homes, emissions from the use of assets not included under organizational boundaries, emissions from means of transportation used by meeting and event participants, etc.

2.6.1 Scope of accounting

* Here, the approach of the Basic Guidelines is omitted, because it deals with the example of emissions from the everyday home lives of employees and consumers.

[Basic approach in the logistics industry]

In the logistics industry, work is sometimes performed with borrowed assets not included under the reporting company's organizational boundaries (such as cargo handling equipment). Emissions from such activities are covered under this category.

[Example]

- Performing work with borrowed cargo-handling equipment at harbors (such as gantry cranes) in harbor freight transportation operations.

2.6.2 Accounting methodology

[Basic approach in the logistics industry]

(1) Accounting methods

Amounts of fuel and electricity used in the assets subject to accounting are multiplied by emissions unit values to determine emissions.

For emissions unit values, please refer to Scopes 1 and 2 of the Report on Emissions Unit Values.

(2) Amount of activity

The asset owners determine the amounts of fuel and electricity used in the assets subject to accounting. If it is not possible to directly determine the amounts of fuel and electricity used in the borrowing period, an amount that can be determined is adjusted according to the ratio of the measurement period to the borrowing period; or the determinable amount is allocated according to the amount of distribution, etc.

[Related links]

- Green value chain platform:
  [http://www.gvc.go.jp/index.html]

- Greenhouse gas emissions in the supply chain (website of Japan's Ministry of the Environment):
  [http://www.env.go.jp/earth/ondanka/supply_chain/comm.html]

[Related documents]

* These documents are provided on the above websites. Please refer to them when accounting for supply chain emissions.

- Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain, Ver. 1.0 (March 2012)

- Report on Emissions Unit Values for Calculation of Greenhouse Gas Emissions, etc., by Organizations Throughout the Supply Chain, Ver. 1.0 (March 2012)

  Appendix: Database of emissions unit values for calculation of greenhouse gas emissions, etc., by organizations throughout the supply chain

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Explanations by Industry (Logistics Industry) for the Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain

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