

**(Provisional Translation)**

**Product Category Rules (PCR)  
(Approved PCR ID: PA-AC-01)**

**PCR Name: Powdered Laundry Detergent**

**Release Date: September 4, 2009**

**CFP Calculation and Labeling Pilot Program**

\*The approved PCR will expire at the end of the CFP Calculation and Labeling Pilot Program (scheduled until March 31, 2012). If the approved PCR is revised by the expiration date, however, the revised PCR shall be valid.

\*This English translation of the original Japanese PCR is provided for information purpose. Please refer to the Japanese version for conducting the CFP calculation.

\*Tentative Database of GHG Emission Factors for the CFP Pilot Project is available on the CFP web (Japanese only)

<http://www.cfp-japan.jp/english/system/data.html>

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## **Introduction**

This PCR prescribes rules, requirements, and instructions applicable to powdery or particulate synthetic detergents (generically called "powdered laundry detergent") among synthetic detergents for washing that are prescribed in the Japan National Standard JIS K3371-1994 "Synthetic detergents for home laundering" under the CFP Calculation and Labeling Pilot Program.

The contents of this PCR are created on the basis of products that retailers manufacture by entrusting to manufacturers and sell them with their private brands (so-called private brand (PB) products). The contents provided in this PCR shall be subject to changes and revisions as needed for further refinement, upon continued discussions with relevant enterprises, during the period of the CFP Pilot Project.

### **1. Scope**

#### **1.1 Product System and System Boundary**

##### **1.1.1 Components of products**

The assessment range includes powdered laundry detergent, package, enclosed accessories, and intermediate packaging materials during distribution.

##### **1.1.2 Functional unit of products**

The sales unit shall be the functional unit of products.

#### **1.2 Life Cycle Stages**

##### **1.2.1 Life Cycle Flow Chart**

Annex A shows the life cycle flow chart.

##### **1.2.2 Life cycle stages to be covered**

[Raw material Acquisition Stage]

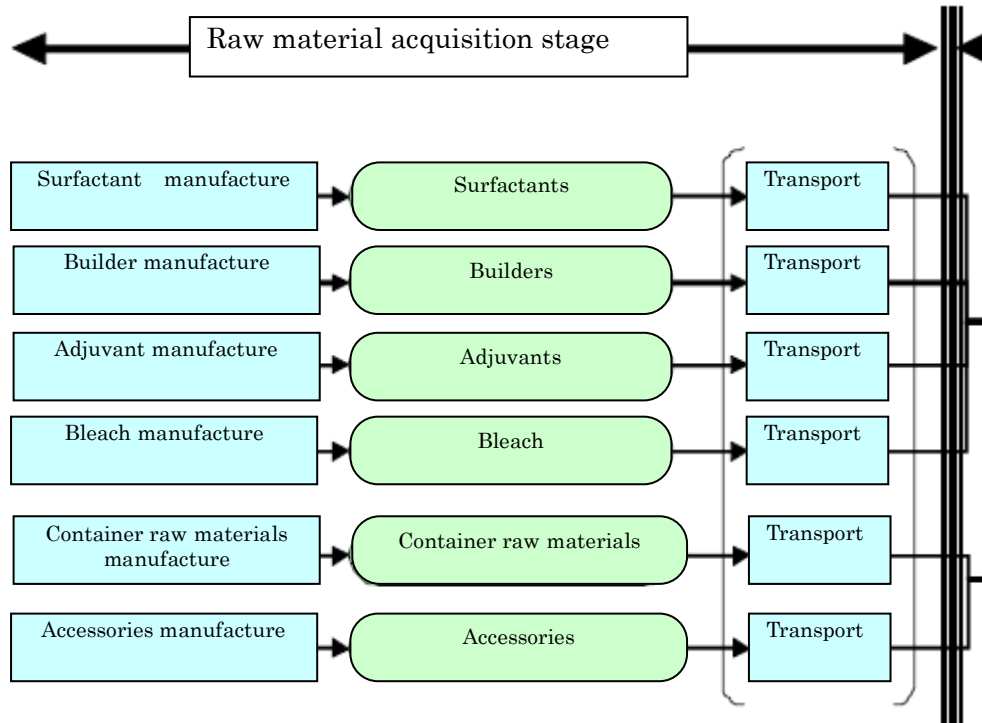


Figure 1 Processes at the raw material acquisition stage

The Raw material acquisition stage consists of the following processes:

- 1) Processes related to the manufacture and transport of surfactants
- 2) Processes related to the manufacture and transport of builders
- 3) Processes related to the manufacture and transport of adjuvants
  - In this PCR, "adjuvants" include such as enzymes, dispersants, foam control agents, fluorescent bleaches, flavors, pigments, disinfectants, and preservatives.
- 4) Processes related to the manufacture and transport of bleaches
- 5) Processes related to the manufacture and transport of containers (or container raw materials)
- 6) Processes related to the manufacture and transport of accessories
- 7) Processes related to the treatment of wastes from the above processes
  - Wastes discharged from each process are treated by external operators. Valuable resources are not included.
- 8) Processes related to the supply of fuel and electric power

All of 1) to 6) shall be traced back to the resources drilling and cultivation processes. The processes of manufacturing and transporting materials for wrapping and packing (packaging) that are used to acquire the above inputs from outside shall be excluded. The operators of the raw

materials manufacturing processes from 1) to 7) may be the same as those at the production stage. However, the steps are identified as the raw material acquisition stage.

Processes not existing at actual raw material acquisition need not be evaluated. (For example, bleach-free detergent needs not be evaluated about processes related to the manufacture and transport of bleaches.)

#### [Production stage]

The production stage consists of the following processes:

- 1) Processes such as blending, drying & granulation, post-processing, and packaging
- 2) Processes related to the treatment of wastewater and wastes from plants
  - Wastes discharged from each process are treated by external operators. Valuable resources are not included.

#### [Distribution and Sales Stage]

The distribution and sales stage consists of the following processes:

- 1) Transport related processes
  - Processes related to the transport of detergent from a detergent plant to consumers
  - Processes related to fuel and electric power consumption by transport and ones related to the manufacture and transport of materials used for transport
- 2) In-store sales processes
  - Processes related to in-store sales
  - Processes related to electric power and fuel consumption and supply at stores
  - Processes related to the disposal of materials used for transport at stores

However, processes not existing at actual transport shall be excluded from the evaluation. (For example, in case of distribution without in-store sales, only transport related processes shall be evaluated.) Warehouse storage at via points (wholesaler and distribution center) from a plant to stores or consumers shall be excluded.

#### [Use and Maintenance Control Stage]

The use and maintenance control stage consists of the following processes:

- 1) Processes generating waste containers and others
  - Processes accompanying unpackaging and consumption of products and generating waste of materials used for transport, containers, and accessories.



- Wastes treatment is included in the disposal and recycling stage.
- 2) Processes accompanying power consumption at washing
  - These processes include the consumption of electric power accompanying the use of washing machines and the supply of such electric power.
- 3) Processes accompanying water consumption at washing
  - These processes include the consumption of tap water accompanying the use of washing machines, the supply of such tap water, and the generation of wastewater.
  - The biodegradation of detergent ingredients in wastewater and the wastewater treatment are included in the disposal and recycling stage.

However, processes not existing at actual transport shall not be discussed.

#### [Disposal and Recycling Stage]

The disposal and recycling stage consists of the following processes:

- 1) Degradation of detergent ingredients in wastewater after washing
- 2) Treatment of wastewater after washing
- 3) Transport of wastes (waste containers, waste accessories, and packaging waste) from household to treatment facilities
- 4) Incineration of waste containers and waste accessories at treatment facilities
- 5) Landfill of waste containers and waste accessories at treatment facilities

The degradation of detergent ingredients in wastewater after washing includes CO<sub>2</sub> emissions not only by degradation in the natural world but also by sludge incineration after sewage treatment.

Regarding the recycling of waste containers, accessories, and materials used for transport, both CO<sub>2</sub> emissions from recycling and indirect CO<sub>2</sub> reduction by recycling shall be excluded from evaluation.

However, processes not existing in actual case shall not be discussed.

## **2. PCR References**

There is no PCR that can be referenced as of August 26, 2009.

### 3. Terms and Definitions

#### 3.1 Powdered laundry detergent

"Powder detergent" generically refers to powdery or particulate synthetic detergents among synthetic detergents for washing that are prescribed in the Japan National Standard JIS K3371-1994 "Synthetic detergents for home laundering."

#### 3.2 Builder

"Builder" generically refers to ingredients that strengthen the effects of surfactants and improve the washing power. ("Encyclopedia of Detergents and Washing" (2003) compiled by Motoi Minagawa, Tomiko Fujii, and Masaru Ohya)

More specifically, the following ingredients are classified as builders:

Classification of Builder			Typical Example
Inorganic builder	Water-soluble compound	Phosphate	Sodium carbonate
		Silicate	Sodium silicate
		Carbonate	Sodium carbonate
		Sulfate	Sodium sulfate
	Water-insoluble compound		Zeolite A
Organic builder	Low-molecular-weight organic chelate builder EDTA		EDTA
	Vinyl-type polymeric polycarboxylate		
	Polysaccharide polymeric polycarboxylate		
	Polymeric polycarboxylate containing ester bond		
	Polymeric polycarboxylate containing acetal bond		
	Polymeric polycarboxylate containing amid bond		

#### 3.3 Adjuvant

"Adjuvant" generically refers to additives that improve performance, maintain quality, and give product features for the efficient manifestation of basic functions. ("Encyclopedia of Detergents and Washing" (2003) compiled by Motoi Minagawa, Tomiko Fujii, and Masaru Ohya)

More specifically, adjuvants include enzymes, dispersants, foam control agents, fluorescent bleaches, flavors, pigments, disinfectants, preservatives, and others.

## **4. Data Collection at Each Life Cycle Stage**

### **4.1 Raw Material Acquisition Stage**

#### **4.1.1 Data collection items and classification of primary and secondary data**

##### **4.1.1.1 Data collection items**

- 1) Life cycle GHG emissions related to the manufacture of surfactants
- 2) Life cycle GHG emissions related to the manufacture of builders
- 3) Life cycle GHG emissions related to the manufacture of adjuvants
- 4) Life cycle GHG emissions related to the manufacture of bleaches
- 5) Life cycle GHG emissions related to the manufacture of container raw materials
- 6) Life cycle GHG emissions related to the manufacture of accessories
- 7) Life cycle GHG emissions accompanying fuel consumption to transport the above raw materials to a plant at the production stage
- 8) Life cycle GHG emissions related to the treatment of wastes from the above processes

Data related to life cycle GHG emissions needs not be collected about processes not existing at actual transport. (If the surfactant manufacturing and later processes at the production stage are on the same site, data collection about 7) and 8) above is not necessary because there is no transport process.

##### **4.1.1.2 Primary data collection items**

At the raw material acquisition stage in this PCR, the collection of primary data is not obligatory about any item.

##### **4.1.1.3 Items for which either primary or secondary data may be used**

Regarding the following items related to the raw material acquisition stage in this PCR, secondary data (including scenario) may be applied.

- 1) Life cycle GHG emissions related to the manufacture of surfactants
- 2) Life cycle GHG emissions related to the manufacture of builders
- 3) Life cycle GHG emissions related to the manufacture of adjuvants
- 4) Life cycle GHG emissions related to the manufacture of bleaches
- 5) Life cycle GHG emissions related to the manufacture of container raw materials
- 6) Life cycle GHG emissions related to the manufacture of accessories

- 7) Life cycle GHG emissions accompanying fuel consumption to transport the above raw materials to a plant at the production stage
- 8) Life cycle GHG emissions related to the treatment of wastes from the above processes
- 9) Life cycle GHG emissions related to the supply of fuel and electric power generated in house, for which no data is available from the Tentative Database of GHG Emission Factors for the CFP Pilot Project

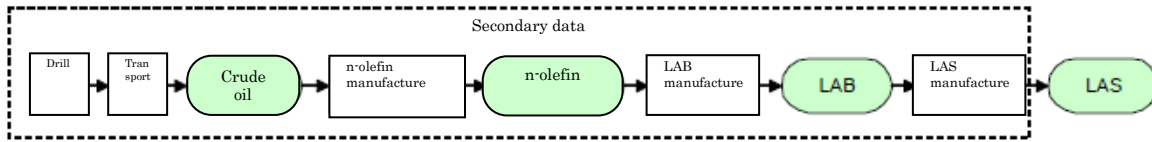
The surfactants, builders, adjuvants, bleaches, containers, and accessories above are manufactured from more raw materials (e.g. oil-derived ingredients that are raw materials for surfactants) through multiple processes.

Therefore, it is permitted to collect primary data about some processes and to apply secondary data only to the life cycle GHG emissions related to the manufacture and transport of upstream raw materials.

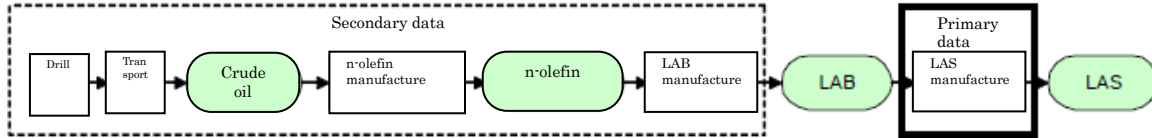
The next figure shows the concept. For the representative surfactant "long-chain alkylbenzenesulfonic acid (LAS)," n-olefin is manufactured from crude oil and then long-chain alkylbenzene (LAB) is manufactured from this n-olefin. If secondary data is provided about LAS, LAB, n-olefin, and crude oil, primary data may be collected about some processes as follows and secondary data may be applied only to the life cycle GHG emissions related to the manufacture and transport of upstream raw materials.

1. The processes from crude oil drilling to LAS manufacturing are totally covered by the application of secondary data about LAS.
2. The processes from crude oil drilling to LAB manufacturing are covered by the application of secondary data about LAB, and primary data is collected about LAS manufacturing.
3. The processes from crude oil drilling to n-olefin manufacturing are covered by the application of secondary data about n-olefin, and primary data is collected about LAB and LAS manufacturing.
4. The processes from crude oil drilling to transport are covered by the application of secondary data about crude oil, and primary data is collected about n-olefin, LAB, and LAS manufacturing.

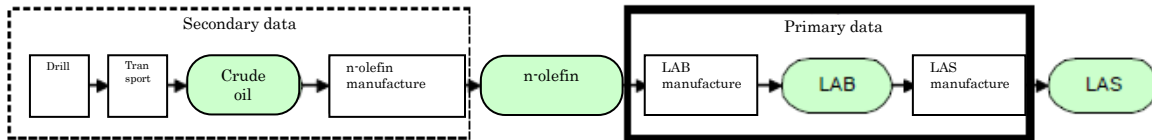
1. Application of secondary data about LAS



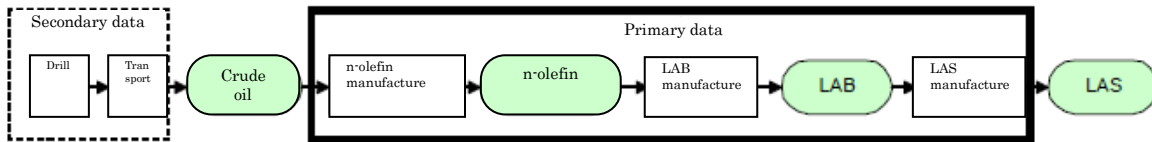
2. Secondary data about LAB and primary data about



2. Secondary data about n-olefin and primary data about LAB manufacture and LAS



4. Secondary data about crude oil and primary data about n-olefin manufacture, LAB manufacture, and LAS manufacture



**4.1.1.4 Secondary data collection item**

Regarding the inputs and outputs related to the raw material acquisition stage in this PCR, secondary data shall be applied to the followings.

- Life cycle GHG emissions related to the supply and use of fuel and electric power acquired from outside about which data is available from the Tentative Database of GHG Emission Factors for the CFP Pilot Project.

**4.1.2 Primary data collection rules**

**4.1.2.1 Data collection method and requirements**

Primary data can be obtained by the following two methods:

- Checking and adding up the input and output items and their emissions by the unit of equipment/facilities operation (unit operating hours, lot, etc.) necessary for process execution (e.g., Facilities operating time x power consumption = electric power input amount)
- Allocating the result of each operator in a specified period among products (e.g., Allocating the total amount of annual fuel input among manufactured products)

Regarding the production stage in this PCR, both measuring methods are acceptable.

If the measuring method of (a) is used, same method shall be applied to other produces which are produced on the same site but not the target of this PCR to indicate that the grand total of the measuring results of all produces will not deviate greatly from the resultant value of the entire site.

If the measuring method of (b) is used, the allocation method shall be the one explained in 4.1.2.4. Indirect fuel and electric power consumptions for air-conditioning and lighting in office may be included in the scope of measurement if they cannot be excluded from measurement.

#### **4.1.2.2 Data collection period**

The most recent one year shall be the data collection period. If data of the most recent one year is not used, its reason shall be clarified. In addition, the accuracy of data not from the most recent one year shall be assured.

#### **4.1.2.3 Handling of raw material acquisition from multiple suppliers**

If raw materials are acquired from multiple suppliers, primary data should be collected about all suppliers. If the number of suppliers is very large, primary data should be used for 50 % or more of the acquired volume, and the average value of data collected from suppliers should be applied as secondary data for suppliers for which data cannot be collected.

#### **4.1.2.4 Allocation method**

Physical quantity (weight) shall be used as the basic parameter for allocation. If any other parameter (physical quantity other than weight, economic value, etc.) is adopted, the basis for using such parameter shall be provided.

#### **4.1.2.5 Handling of regional differences and seasonal variations**

The primary data shall not be considered about regional differences or seasonal variations.

#### **4.1.2.6 Handling of self-produced electricity**

If power is generated on a site and used for the production of the product, the fuel amount input for the power generation shall be collected as primary data and the GHG emissions related to the manufacture and combustion shall be assessed.

### 4.1.3 Secondary data application rules

#### 4.1.3.1 Contents and sources of secondary data

The secondary data available at the raw material acquisition stage in this PCR is from the Tentative Database of GHG Emission Factors for the CFP Pilot Project. Data not in the database may be prepared (including the application of other secondary data) by a CFP applicant on condition that evidence guaranteeing the validity of application of such data is prepared. Validity of the secondary data to be provided by the CFP applicants shall be verified when the CFP calculation results are verified.

The data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project applies to processes in Japan. When applying such data to overseas data, the validity of the application must be provided, even if process names or raw material names are the same.

The secondary data below is specified in Annex E altogether because it is common to all life cycle stages.

- Life cycle GHG emissions related to the supply and use of fuel and electric power
- Life cycle GHG emissions related to the manufacture and transport of containers and packaging materials
- Life cycle GHG emissions related to the treatment of wastes
- GHG emissions by fuel consumption per transport ton kilometer

#### 4.1.3.2 Contents of scenario

##### 4.1.3.2.1 Raw materials transport scenario

Regarding transport from supplier, it is basically preferable to collect primary data about the transport distance, the means of transport, and the loading ratio. If this is not possible, however, the scenario below may be used. See Annex C for the methodology for setting the following transport scenario:

1. Land transport only
  - <Transport distance> 500 km
  - <Means of transport> 10-ton-truck (Light oil)
  - <Loading ratio> 62 %
2. Includes Maritime transport
  - i. Domestic transport (Production site → Port)

<Transport distance> 500 km

<Means of transport> 10-ton-truck (Light oil)

<Loading ratio> 62 %

ii. International transport (Port → Port)

<Transport distance> Sailing distance between ports (\*)

<Means of transport> Container ship (4,000 TEU or less)

(\*) The international sailing distance in Annex D may be used.

iii. Transport in Japan (Port → Destination)

<Transport distance> 500 km

<Means of transport> 10-ton truck (Light oil)

<Loading ratio> 62 %

#### **4.1.4 Cut-off criteria**

The materials input to the raw material acquisition stage may be cut-off if total GHG emissions related to their manufacture and transport is within 5% of the total GHG emissions at the raw material acquisition stage.

#### **4.1.5 Evaluation of recycled materials and reused products**

If recycled materials or reused products are used as inputs, the GHG emissions related to their manufacture and transport shall include the GHG emissions accompanying the recycling processes (collection, preprocessing, regeneration, etc.) and reuse processes (collection, washing, etc.).

## **4.2 Production Stage**

### **4.2.1 Data collection items and classification of primary and secondary data**

#### **4.2.1.1 Data collection items**

Regarding the production stage in this PCR, data shall be collected about the followings:

<Input>

1. Surfactant input amount
2. Builder input amount
3. Adjuvant input amount
4. Bleach input amount
5. Container (or container raw materials) input amount



6. Accessories input amount
7. Water (industrial water and tap water) input amount
8. Fuel and electric power input amount

Regarding "7. Water input amount," there is no need to check the usage of well water pumped at the site of an operator. However, the fuel and power input amount used for pumping shall be checked at 8. .

<Output and discharge>

9. Detergent production output
10. Byproduct amount
11. Wastes discharge amount

<Life cycle GHG emissions from input and discharge>

12. Life cycle GHG emissions related to the supply of industrial water
13. Life cycle GHG emissions related to the supply of tap water
14. Life cycle GHG emissions related to the treatment of wastes

The life cycle GHG emissions related to the supply of inputs from 1. to 6. shall be excluded from the data collection items at the production stage because they are checked at the raw material acquisition stage.

#### **4.2.1.2 Primary data collection items**

Regarding the production stage in this PCR, primary data shall be collected about the followings:

<Input>

1. Surfactant input amount
2. Builder input amount
3. Adjuvant input amount
4. Bleach input amount
5. Container (or raw materials for container) input amount
6. Accessories input amount
7. Water (industrial water and tap water) input amount
8. Fuel and electric power input amount

<Output and discharge>

9. Detergent production output

10. Byproduct amount

11. Wastes discharge amount

#### **4.2.1.3 Items for which either primary or secondary data may be used**

Regarding the following items related to the production stage in this PCR, it is preferable to collect primary data but secondary data may be applied instead.

- Life cycle GHG emissions related to the supply of industrial water
- Life cycle GHG emissions related to the supply of tap water
- Life cycle GHG emissions related to the treatment of wastes
- Life cycle GHG emissions related to the supply and use of fuel and electric power, for which no data is available from the Tentative Database of GHG Emission Factors for the CFP Pilot Project

#### **4.2.1.4 Secondary data collection items**

Regarding the inputs and outputs related to the production stage in this PCR, secondary data shall be applied.

- Life cycle GHG emissions related to the supply and use of fuel and electric power purchased from outside, for which no data is available from the Tentative Database of GHG Emission Factors for the CFP Pilot Project

### **4.2.2 Primary data collection rules**

#### **4.2.2.1 Data collection method and conditions**

Primary data can be obtained by the following two methods:

- (a) Checking and adding up the input and output items and their emissions by the unit of work or equipment/facilities operation (unit operating hours, one lot, etc.) necessary for process execution  
(e.g., Facilities operating time × power consumption by facilities = power input amount)
- (b) Allocating the result of each operator in a specified period between outputs  
(e.g., Allocating the total amount of annual fuel input between products)

Regarding the production stage in this PCR, both measuring methods are acceptable.

If the measuring method of (a) is used, same method shall be applied to other produces which are produced on the same site but not the target of this PCR produced on the same site to indicate that the grand total of the stack results of all produces will not deviate greatly from the resultant value of the entire site.

If the measuring method of (b) is used, the allocation method shall be the one as explained below. Indirect fuel and electric power consumptions such as air-conditioning and lighting in office may be included in the scope of measurement if they cannot be excluded from measurement.

#### **4.2.2.2 Data collection period**

For all data, the most recent one year shall be basically the primary data collection period. If data of the most recent one year is not used, its reason shall be submitted as a verification document to assure the accuracy of the used data.

#### **4.2.2.3 Handling of production on multiple sites**

If there is more than one production site, primary data shall be collected about all sites. If the number of production sites is very large, primary data for major production sites may be applied as secondary data for all other production sites, provided that combined production at major production sites covers 95% or more of the total amount of production.

#### **4.2.2.4 Allocation method**

Physical quantity (weight) shall be used as the basic parameter for allocation. If any other parameter (physical quantity other than weight, economic value, etc.) is adopted, the basis for using such parameter shall be provided.

#### **4.2.2.5 Handling of regional differences and seasonal variations**

The primary data needs not be considered about regional differences or seasonal variations.

#### **4.2.2.6 Handling of self-produced electricity**

If power is generated on a production site and used for the production of the product, the fuel amount input for the power generation shall be collected as primary data and the GHG emissions related to the manufacture and combustion shall be assessed.

### **4.2.3 Secondary data application rules**

#### **4.2.3.1 Contents and sources of secondary data**

This section prescribes the contents and sources of secondary data available at the production stage in this PCR.

Secondary data not given below may be prepared (including the application of other secondary data) by a CFP applicant on condition that evidence guaranteeing the validity of application of

such data is prepared. Validity of the secondary data to be provided by the CFP applicants shall be verified when the CFP calculation results are verified.

Both the GHG emission factors and the reference data mentioned in this PCR apply to fuels and power used in Japan, raw materials manufactured in Japan, and processes implemented in Japan. When applying such data to overseas data, the validity of the application must be provided.

■ Life cycle GHG emissions related to the supply and use of fuel and electric power

See Annex E: E.1 Life Cycle GHG Emissions Related to Supply and Use of Fuel and Electric Power.

■ Life cycle GHG emissions related to the supply of water

See Annex E: E.2 Life Cycle GHG Emissions Related to Water Supply.

■ Life cycle GHG emissions related to the treatment of wastes

See Annex E: E.4 Life Cycle GHG Emissions Related to the Treatment of Wastes and Wastewater.

#### **4.2.3.2 Contents of scenario**

##### **4.2.3.2.1 Wastes transport scenario**

Regarding transport from a manufacturing plant, it is basically preferable to collect primary data about the transport distance, means of transport and loading ration. If it is not possible, however, the scenario below may be used. See Annex C for the methodology for setting the following transport scenario:

<Transport distance> 50 km

<Means of transport> 10-ton truck (Light oil)

<Loading ratio> 62%

#### **4.2.4 Cut-off criteria**

Data may be cut-off for materials input to the production stage whose total GHG emissions related to their manufacture and transport is within 5% of the total GHG emissions at the production stage.

#### **4.2.5 Evaluation of recycled materials and reused products**

If recycled materials or reused products are used as inputs, the GHG emissions related to their manufacture and transport shall include the GHG emissions accompanying the recycling processes (collection, preprocessing, regeneration, etc.) and reuse processes (collection, washing, etc.).

### **4.3 Distribution and Sales stage**

#### **4.3.1 Data collection items and classification of primary and secondary data**

##### **4.3.1.1 Data collection items**

At the distribution and sales stage, this PCR applies to the following processes:

- 1) Transport related processes: Processes related to transport from a plant to consumers
- 2) In-store sales processes: Processes related to sales in-stores

##### ● Data collection items about transport related process

1. Cargo weight
2. GHG emissions related to the use of fuel

Fuel usage in transport shall be assessed by the fuel consumption method, the fuel cost method, or the improved ton-kilometer method prescribed in the Act on the Rational Use of Energy. For each fuel usage assessment method, see Annex B.

(Fuel method)

- Fuel usage

(Fuel cost method)

- Transport distance
- GHG emissions by fuel consumption per distance covered

(Improved ton-kilometer method)

- Transport distance
- GHG emissions by fuel consumption per transport ton kilometer
- Loading ratio

(Common)

- Usage of materials used for transport
- Life cycle GHG emissions related to the manufacture and transport of materials used for transport

- Data collection items about in-store sales process
  - Life cycle GHG emissions related to the supply and use of fuel and electric power required for in-store counter sales process
  - Life cycle GHG emissions related to the disposal of waste materials used for transport from a store
 However, packaging waste recovered for a value shall be excluded.

- Common data collection item
  - Life cycle GHG emissions related to the supply and use of fuel and electric power

#### 4.3.1.2 Primary data collection items

Regarding the distribution and sales stage in this PCR, primary data shall be collected about the following inputs and outputs:

- Data collection items about the transport process
  - Common: Transport amount of powder detergent for clothing
  - Fuel method: Fuel input amount
  - Fuel cost method: GHG emissions by fuel consumption per distance covered
  - Common: Usage of materials used for transport
- Data collection items about the store sales process
  - Waste materials used for transport generation amount

#### 4.3.1.3 Items for which either primary or secondary data may be used

Regarding the distribution and sales stage in this PCR, both the application of primary data and secondary data (including scenario application) are accepted.

- Data collection items about transport related process
  - Improved ton-kilometer method: GHG emissions by fuel consumption per transport ton kilometer
  - Improved ton-kilometer method: Loading ratio
  - Common: Transport distance
  - Common: Life cycle GHG emissions related to the manufacture and transport of materials used for transport

- Data collection items about the in-store sales process
  - Life cycle GHG emissions related to the use of fuel and electric power necessary for the in-store sales process
  
- Common data collection item
  - Life cycle GHG emissions related to the supply and use of fuel and electric power, for which no data is available from the Tentative Database of GHG Emission Factors for the CFP Pilot Project.

#### **4.3.1.4 Secondary data collection items**

Regarding the distribution and sales stage in this PCR, specified data shall be applied to the following inputs and outputs:

- Life cycle GHG emissions related to the supply and use of fuel and electric power acquired from outside, for which no data is available from the Tentative Database of GHG Emission Factors for the CFP Pilot Project .

### **4.3.2 Primary data collection rules**

#### **4.3.2.1 Data collection method and conditions**

Fuel usage in distribution shall be assessed by the fuel consumption method, the fuel cost method, or the improved ton-kilometer method prescribed in the Act on the Rational Use of Energy.

The transport distance may be actually measured or obtained from navigation software.

#### **4.3.2.2 Data collection period**

For all data, the most recent one year shall be basically the primary data collection period. If data of the most recent one year is not used, its reason shall be submitted as a verification document to assure the accuracy of data not from the most recent one year.

#### **4.3.2.3 Handling of products on multiple transport routes and sales site**

##### **4.3.2.3.1 Multiple transport routes**

If there is more than one transport route for detergent, primary data shall be collected about all routes and weight-averaged by the transport amount. If the number of transport routes is very large, primary data should be used for 50 % or more of the total amount, and the average value of

data collected from routes should be applied as secondary data for routes for which data cannot be collected.

If no primary data is available, the product transport scenario in 4.3.3.2.1 may be applied.

#### **4.3.2.3.2 Multiple sales sites**

If there are multiple sales sites for detergent, primary data shall be collected about all sites and weight-averaged by the sales amount. If the number of sales sites is very large, primary data should be used for 50 % or more of the total amount, and the average value of data collected from sales sites should be applied as secondary data for routes for which data cannot be collected.

If no primary data is available, the secondary data about sales store in 4.3.3.1 may be applied.

#### **4.3.2.4 Allocation method**

##### **4.3.2.4.1 Transport process allocation method**

Physical quantity (weight) shall be used as the basic standard for allocating energy in transport.

If it is difficult to measure only the related quantity but data related to multiple products is available, however, the data may be allocated by the sales amount.

##### **4.3.2.4.2 Sales process allocation method**

Physical quantity (weight) shall be used as the basic standard for allocating energy in sale. If it is difficult to measure only the related quantity but data related to multiple products is available, however, the data may be allocated by the sales amount.

#### **4.3.2.5 Handling of regional differences and seasonal variations**

Primary data about the transport and sales processes differs between areas. Therefore, primary data shall be basically collected about all transport routes and sales sites.

If it is difficult to collect primary data about all transport routes and sales sites, see 4.3.2.3 to represent all by partial data or to apply a scenario or secondary data.

#### **4.3.2.6 Handling of self-produced electricity**

If power is generated in a sales store and used for the production of the product, the fuel amount input for the power generation shall be collected as primary data and the GHG emissions related to the manufacture and combustion shall be assessed.



### 4.3.3 Secondary data application rules

#### 4.3.3.1 Contents and sources of secondary data

This section prescribes the contents and sources of secondary data available at the distribution and sales stage in this PCR.

Secondary data not given below may be prepared (including the application of other secondary data) by a CFP applicant that evidence guaranteeing the validity of application of such data is prepared. Validity of the secondary data to be provided by the CFP applicants shall be verified when the CFP calculation results are verified.

■ Life cycle GHG emissions related to the supply and use of fuel and electric power

See Annex E: E.1 Life Cycle GHG Emissions Related to Supply and Use of Fuel and Electric Power.

■ (Improved ton-kilometer method) GHG emissions by fuel consumption per transport ton kilometer

See Annex E: E.5 GHG Emissions by Fuel Consumption per Transport Ton Kilometer.

■ Regarding life cycle GHG emissions related to in-store sales, this PCR specifies the following reference data as applicable secondary data because there is no corresponding data in the Tentative Database of GHG Emission Factors for the CFP Pilot Project.

	Input Name	Numeric Value		Source
1	Store sales (at room temperature)	0.556	g- CO <sub>2</sub> e/yen	Ohno, Ikuhiro (2008): “Carbon Footprint in the Distribution Industry,” Proceedings of the Lecture Meeting of the Food Study Group on Carbon Footprint, the Institute of Life Cycle Assessment, Japan. August 1, 2008, p.74.

■ Life cycle GHG emissions related to the manufacture and transport of materials used for transport

See Annex E: E.3 Life Cycle GHG Emissions Related to Manufacturing of Containers, Packaging Materials, Materials used for Transport, and Various Other Materials.

■ Life cycle GHG emissions related to the disposal of materials used for transport

See Annex E: E.4 Life Cycle GHG Emissions Related to the Treatment of Wastes and Wastewater.

Regarding the incineration data prescribed in E.4 however, CO<sub>2</sub> emissions deriving from carbon in wastes should be separately assessed and added because it derives from the combustion of fuel input for wastes incineration.

#### 4.3.3.2 Contents of scenario

##### 4.3.3.2.1 Product transport scenario

Regarding the product transport related processes, it is basically preferable to collect primary data about the transport distance, the means of transport, and the loading ratio. If this is not possible, however, the scenario below may be used. See Annex C for the methodology for setting the following transport scenario:

(1) Production site outside Japan

(Production site → Port of producing country)

<Transport distance>500km

<Means of transport>10-ton truck (Light oil)

<Loading ratio> 62 %

(Port of producing country → Port in Japan)

<Transport distance> Sailing distance between ports (\*)

<Means of transport> Container ship (4000 TEU or less)

(\*) The international sailing distance in Annex D may be used.

(Port in Japan → Store)

<Transport distance> 1000 km

<Means of transport> 10-ton truck (Light oil)

<Loading ratio> 62 %

(2) Production site in Japan

(Production site → Store)

<Transport distance>1000 km

<Means of transport>10-ton truck (Light oil)

<Loading ratio> 62 %

#### **4.3.3.2.2 Packaging waste transport scenario**

Regarding the transport of packaging waste from a store to treatment facilities, it is basically preferable to collect primary data about the transport distance, the means of transport, and the loading ratio. If this is not possible, however, the scenario below may be used. See Annex C for the methodology for setting the following transport scenario:

<Transport distance> 50 km

<Means of transport> 10-ton truck (Light oil)

<Loading ratio> 62 %

### **4.4 Use and Maintenance Control Stage**

#### **4.4.1 Data collection items and classification of primary and secondary data**

##### **4.4.1.1 Data collection items**

Regarding the use and maintenance control stage in this PCR, data shall be collected about the followings:

<Input>

1. Detergent input amount
2. Power input amount
3. Tap water input amount

<Discharge>

4. Wastewater discharge amount
5. Discharge amount of waste containers, accessories, and materials used for transport

The biodegradation of detergent ingredients in wastewater after washing and the treatment of wastewater are excluded from the data collection items at the use and management stage because they are checked at the disposal and recycling stage. Likewise, the disposal of waste containers and accessories is also excluded from the data collection items at the use and management control stage because they are checked at the disposal and recycling stage.

The waste materials used for transport at 5. are generated only in direct delivery to consumers not via stores.

##### **4.4.1.2 Primary data collection items**

Primary data shall be collected about the followings:

<Input>

1. Detergent input amount

<Discharge>

2. Discharge amount of waste containers and accessories

#### **4.4.1.3 Items for which either primary or secondary data may be used**

Regarding the following items at the washing process by washing machine, secondary data (scenario) applies. As the basic scenario, this PCR prepares the washing process scenario shown in 4.4.3.2. If the inputs and outputs in the basic scenario can be reduced by improving the detergent performance, however, an applicable scenario may be set on condition that its evidence should be presented.

<Input>

1. Electric power input amount
2. Tap water input amount

<Discharge>

3. Wastewater discharge amount

#### **4.4.1.4 Secondary data collection item**

To the following items related to the use and management control stage in this PCR, secondary data shall be applied:

- Life cycle GHG emissions related to the supply of fuel and electric power
- Life cycle GHG emissions related to the supply of tap water

#### **4.4.2 Primary data collection rules**

The primary data collection items "Detergent input amount" and "Discharge amount of waste containers and accessories" correspond to "Standard usage based on the Household Goods Quality Labeling Act" and "Weight of waste containers and accessories by sales unit" in product specifications.

#### **4.4.3 Secondary data application rules**

##### **4.4.3.1 Contents and sources of secondary data**

- Life cycle GHG emissions related to the supply and use of electric power
- Life cycle GHG emissions related to the supply of water

#### 4.4.3.2 Contents of scenario

##### 4.4.3.2.1 Scenario of washing process by washing machine

For the washing process by washing machine, this PCR prepares the basic scenario given below. The contents of this PCR are created on the basis of PB products in the retail industry and subject to change or correction by future repetitive discussions with related operators for enhancement.

<Basic scenario>

At present (August 26, 2009), 31 washing machines are registered on the green purchasing network (GPN) "Eco Products Net" (<http://www.gpn-eco.net/category/init.php?id=12>). From the washing machines having the best-selling standard washing capacity (the maximum mass of dry laundry that can be washed at a time) of 7 kg, a product of the greatest power consumption per washing was selected and its power consumption at washing (Wh) and water usage at washing (L) were set as "Electric power input amount," "Tap water input amount," and "Waste water discharge amount" in the basic scenario. The standard water level was set to 60 L by considering that of the selected product.

<Contents of basic scenario>

- Standard washing capacity: 7 kg
- Electric power input amount → Power consumption at washing: 120 Wh
- Tap water input amount → Water usage at washing: 118 L
- Waste water discharge amount: 118 L (All water assumed to be discharged)

The detergent input amount shall be the usage of detergent for the standard water level in the basic scenario. If a CFP applicant separately sets a scenario to reduce "Electric power input amount," "Tap water input amount," and "Waste water discharge amount" by improving the detergent performance, the possible amounts of reduction shall be assessed on the basis of the contents of the basic scenario.

##### 4.4.3.2.2 Product maintenance scenario

Omitted because there is no GHG emissions related to the storage of detergent at home and scenario setting is not necessary

#### **4.4.4 Cut-off criteria**

Omitted because a product scenario prescribed in the PCR (4.4.3.2.1) is used and no cut-off criteria is necessary

### **4.5 Disposal and Recycling Stage**

#### **4.5.1 Data collection items and classification of primary and secondary data**

##### **4.5.1.1 Data collection items**

Regarding the disposal and recycling stage in this PCR, data shall be collected about the followings:

1. GHG emissions by the degradation of detergent ingredients
2. GHG emissions related to the treatment of wastewater after washing
3. GHG emissions related to the transport of waste containers, accessories, and materials used for transport to treatment facilities
4. Amount of waste containers, accessories, and materials used for transport incinerated at treatment facilities
5. Amount of waste containers, accessories, and materials used for transport landfilled at treatment facilities
6. GHG emissions related to incineration at treatment facilities (other than CO<sub>2</sub> from packaging waste)
7. GHG emissions deriving from packaging waste by incineration
8. GHG emissions related to landfill at treatment facilities

1. Regarding “GHG emissions by the degradation of detergent ingredients”, CO<sub>2</sub> emissions of carbon in detergent ingredients not only by degradation in the natural world but also by sludge incineration after sewage treatment shall be accounted.

Regarding “1. GHG emissions by the degradation of detergent ingredients” and “7. GHG emissions deriving from packaging waste by incineration,” however, CO<sub>2</sub> emissions deriving from biomass may be considered as carbon-neutral and need not to be accounted.

##### **4.5.1.2 Primary data collection items**

At the disposal and recycling stage in this PCR, primary data shall be collected about the following (the waste water discharge amount and the amount of waste containers, accessories,

and materials used for transport are collected at the use and maintenance control stage as primary data).

1. GHG emissions by the degradation of detergent ingredients

#### **4.5.1.3 Items for which either primary or secondary data may be used**

At the disposal and recycling stage in this PCR, there are no data collection items that both primary and secondary data are acceptable. From 2. to 8. among the above data collection items, primary data can be collected only if the consumer residing area can be identified. Since this kind of identification is not practical, however, secondary data shall be applied uniformly.

#### **4.5.1.4 Secondary data collection items**

Regarding the following items related to the disposal and recycling stage in this PCR, secondary data shall be applied.

2. GHG emissions related to the treatment of wastewater after washing
3. GHG emissions related to the transport of waste containers, accessories, and materials used for transport to treatment facilities
4. Amount of waste containers, accessories, and materials used for transport incinerated at treatment facilities
5. Amount of waste containers, accessories, and materials used for transport landfilled at treatment facilities
6. GHG emissions related to incineration at treatment facilities (other than CO<sub>2</sub> from packaging waste)
7. GHG emissions deriving from packaging waste by incineration
8. GHG emissions related to landfill at treatment facilities

### **4.5.2 Rules about Collection of Primary Data**

#### **4.5.2.1 Data collection method and conditions**

For "GHG emissions by the degradation of detergent ingredients," the CO<sub>2</sub> emissions assessed from stoichiometric relations on the assumption that all carbons (C) in detergent ingredients should be emitted as CO<sub>2</sub>. Detergent ingredients deriving from biomass, however, are considered carbon-neutral and CO<sub>2</sub> generated by their biodegradation is not be accounted.

#### **4.5.2.2 Data collection period**

For "GHG emissions by the degradation of detergent ingredients," no data collection period is specified particularly because it is determined by the types of detergent ingredients and their blending ratio.

#### **4.5.2.3 Handling of regional differences and seasonal variations**

Local differences or seasonal variations are not considered.

### **4.5.3 Secondary data collection rules**

#### **4.5.3.1 Contents and sources of secondary data**

This section prescribes the contents and sources of secondary data available at the disposal and recycling stage in this PCR.

Secondary data not given below may be prepared (including the application of other secondary data) by a CFP applicant on condition that evidence guaranteeing the validity of application of such data is prepared. Validity of the secondary data to be provided by the CFP applicants shall be verified when the CFP calculation results are verified.

- Life cycle GHG emissions related to the treatment of wastes

See Annex E: E.4 Life Cycle GHG Emissions Related to the Treatment of Wastes and Wastewater.

- Improved ton-kilometer method: GHG emissions by fuel consumption by transport ton kilometer

See Annex E: E.5 GHG Emissions by Fuel Consumption per Transport Ton Kilometer.

- GHG emissions deriving from packaging waste by incineration

See Annex E: E.4 Life Cycle GHG Emissions Related to the Treatment of Wastes and Wastewater.

#### **4.5.3.2 Contents of scenario**

##### **4.5.3.2.1 Waste transport scenario**

Regarding the assessment of GHG emissions related to the transport of packaging waste from household to treatment facilities, it is preferable to collect primary data but the scenario below may be used instead.

<Transport distance> 50 km



<Means of transport> 10-ton truck (Light oil)

<Loading ratio> 62 %

#### **4.5.3.2.2 Treatment scenario**

For the disposal method for the packaging waste transported to disposal facility, it is desirable to collect primary data but the following scenario may also be applied. The following assumptions are applied from the current status of disposal of general waste described in “The current status of emission, disposal, etc. of general waste (actual data for fiscal year 2006),” published by the Ministry of the Environment.

- 92 % of the packaging waste is incinerated.
- 3 % is directly landfilled, and 14 % is landfilled including incinerated ash.
- 5 % is recycled. Environmental load related to recycling shall not be included.

## **5. Communication Method**

### **5.1 Label Format, Position, and Size**

The format and size of the CFP label shall comply with "Specifications of CFP Label and Displaying Other Information."

The carbon footprint label can be on the package. The logo may also appear on POP, brochure, and the Internet.

It shall be stated clearly that the carbon footprint value includes GHG emissions by washing and biodegradation.

### **5.2 Contents of Additional Information**

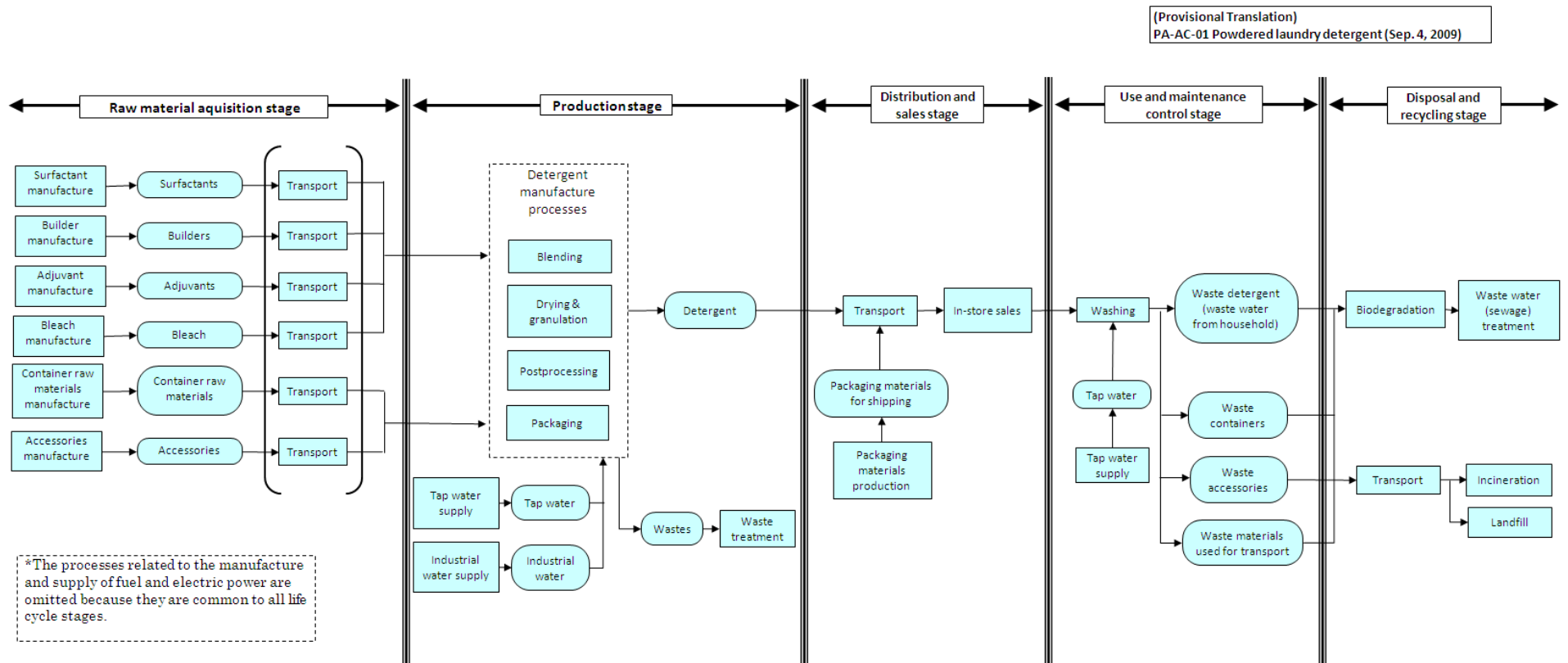
Carbon footprint may be labeled not only per unit of sale but also per washing.

To appropriately notify consumers of GHG emissions reduction efforts by producers and operators, additional labeling is permitted about the amount of past reduction by the same operator about a product judged to be the same or similar.

By expecting the effect of urging each process operator to make reduction efforts, additional labeling by process or labeling by part is also permitted.

As additional information (e.g., in case of labeling reduction, for example, GHG emissions before reduction), only contents acknowledged as appropriate by the PCR Committee shall be labeled.

# Annex A: Life Cycle Flow Chart



## **Annex B: Assessment Method for GHG Emissions Accompanying Fuel Consumption During Transport**

### **B.1 Fuel Consumption Method**

- 1) Collect data on fuel consumption for each means of transport.
- 2) Calculate the amount of life cycle GHG emissions [kg-CO<sub>2</sub>e] by multiplying the amount of fuel consumption [kg (or L)] and the “amount of life cycle GHG emissions related to supply and use of fuel” [kg-CO<sub>2</sub>e/kg (or L)] (secondary data) for each type of fuel.

### **B.2 Fuel Cost Method**

- 1) Collect data on fuel cost [km/L] and transport distance [km] for each means of transport, and calculate the amount of fuel consumption [kg] by multiplying the two parameters.
- 2) Calculate the amount of life cycle GHG emissions [kg-CO<sub>2</sub>e] by multiplying the amount of fuel consumption [kg (or L)] and the “amount of life cycle GHG emissions related to supply and use of fuel” [kg-CO<sub>2</sub>e/kg (or L)] (secondary data) for each type of fuel.

### **B.3 Improved Ton-Kilometer Method**

- 1) Collect data on loading ratio [%] and transport load (transport ton-kilometer) [t-km] for each means of transport.
- 2) If the loading ratio is unknown, assume it to be 62 %.
- 3) Calculate the amount of life cycle GHG emissions [kg-CO<sub>2</sub>e] by multiplying the transport load (transport ton-kilometer) [t-km] by the “amount of life cycle GHG emissions related to fuel consumption per transport ton-kilometer” [kg-CO<sub>2</sub>e/t/km] (secondary data) for different transport loads for each means of transport.

## **Annex C: Transport Scenario Setting**

In this PCR, transport scenarios are set for cases where primary data is not available in the Raw Material Acquisition Stage, the Production Stage, the Distribution and Sales Stage and the Disposal and Recycling Stage. Assumptions for each scenario are as follows:

### **C.1 Transport Distance**

<Domestic transport>

To provide an incentive for primary data collection, transport distances are set at longer possible distances rather than at an average distance.

(a) Transport within a city or not across adjacent cities: 50 km

[Assumption] The distance from a prefectural center to a prefectural border is assumed.

(b) Transport within a prefecture: 100 km

[Assumption] The distance from a prefectural border to another side of the border is assumed.

(c) Transport possibly across prefectures: 500 km

[Assumption] The distance from Tokyo to Osaka is assumed.

(d) Transport from producer to consumer (consumption place not limited within a specific area): 1000 km

[Assumption] The distance a little longer than half Honshu (the main island of Japan: 1600 km) is assumed.

<Domestic transport in overseas country>

(a) Transport from production site to port: 500 km

[Assumption] The distance from a state border to a state center is assumed.

<International transport>

The sailing distance in Annex D may be used.

### **C.2 Means of Transport**

<Transport in Japan>

Truck transport is basically assumed for an incentive to take CO<sub>2</sub> reduction measures in distribution such as modal shift. Large vehicles were set for distributors and rather small ones for others.

- (a) Transport by distributor: 10-ton truck
- (b) Transport by other operator: 2-ton truck

<International transport>

Since this is maritime transport only, the means of transport is set uniformly to "Container ship (4,000 TEU or less)."

### C.3 Loading Ratio

<Truck>

Values to be applied when loading ratio is unknown were taken from the following table in the "Methods for calculating the energy consumption related to cargo transport by cargo transport carriers," a notification by the Ministry of Economy, Trade and Industry.

Vehicle Type	Fuel	Maximum Load (kg)		When loading ratio is unknown			
				Average Loading Ratio		Basic Unit(I/t-km)	
			Median	For household	For business	For household	For business
Light, compact and ordinary trucks	Gasoline	Light trucks	350	10%	41%	2.74	0.741
		~1,999	1000	10%	32%	1.39	0.472
		2000 or more	2000	24%	52%	0.394	0.192
Compact and ordinary trucks	Light oil	~999	500	10%	36%	1.67	0.592
		1,000~1,999	1500	17%	42%	0.530	0.255
		2,000~3,999	3000	39%	58%	0.172	0.124
		4,000~5,999	5000	49%	62%	0.102	0.0844
		6,000~7,999	7000			0.0820	0.0677
		8,000~9,999	9000	0.0696	0.0575		
		10,000~11,999	11000	0.0610	0.0504		
		12,000~16,999	14500	0.0509	0.0421		

This PCR applies these set values also to overseas land transport trucks.

## Annex D: International Sailing Distance

The following distance data may be used:

(A representative port was set for each country and distance data was extracted from Lloyds Register Fairplay "Ports & Terminals Guide 2003-2004.")

### <Asia>

- Japan - Korea: 1,156 km
- Japan - Russia (Far East): 1,677 km
- Japan - China: 1,928 km
- Japan - Taiwan: 2,456 km
- Japan - Malaysia: 5,683 km
- Japan - Thailand: 5,358 km
- Japan - India: 5,834 km
- Japan - Saudi Arabia: 12,084 km

### <North America>

- Japan - Canada: 7,697 km
- Japan - USA: 8,959 km

### <South America>

- Japan - Peru: 15,572 km
- Japan - Chili: 17,180 km
- Japan - Brazil: 21,022 km

### <Oceania>

- Japan - Australia: 8,938 km
- Japan - New Zealand: 8,839km

### <Europe>

- Japan - France: 25,999 km
- Japan - UK: 26,297 km
- Japan - Germany: 27,175 km
- Japan - Russia (European side): 29,007 km

## Annex E: Secondary Data Common to All Life Cycle Stages

Both the GHG emission factors and the reference data mentioned in this PCR apply to fuels and power used in Japan, raw materials manufactured in Japan, and processes implemented in Japan. When applying such data to overseas cases, the validity of the application must be provided.

Secondary data not given below (data where no data is available from the Tentative Database of GHG Emission Factors for the CFP Pilot Project) may be prepared by a CFP applicant on condition that evidence guaranteeing the validity of application of such data is prepared. Validity of the secondary data to be provided by the CFP applicants shall be verified when the CFP calculation results are verified.

### E.1 Life Cycle GHG Emissions Related to Supply and Use of Fuel and Electric Power

#### E.1.1 Application of GHG Emission Factors

For the items below, "Manufacture" and "Combustion" of the said fuel type in the Tentative Database of GHG Emission Factors for the CFP Pilot Project shall be used. The correspondence is as follows:

##### ■ Life cycle GHG emissions related to the supply of fuel and electric power

	Fuel Type		Corresponding item
1	Fuel manufacture	Light oil	"Light oil"
2		Kerosene	"Kerosene"
3		Gasoline	"Gasoline"
4		Heavy oil A	"Heavy oil A"
5		Heavy oil B	"Heavy oil B"
6		Heavy oil C	"Heavy oil C"
7		LPG	"Liquefied petroleum gas (LPG)"
8		Utility gas 13A	"Utility gas13A"
9	Power	Steam	"Steam"
10	Purchased electric power		Electric power (average in Japan)

##### ■ GHG emissions related to the use of fuel and electric power

	Fuel Type		Corresponding item
1	Fuel	Light oil	"Combustion/Light oil"
2		Kerosene	"Combustion/Kerosene"
3		Gasoline	"Combustion/Gasoline"
4		Heavy oil A	"Combustion/Heavy oil A"
5		Heavy oil B	"Combustion/Heavy oil B"
6		Heavy oil C	"Combustion/Heavy oil C"
7		LPG	"Combustion/LPG"
8		Utility gas 13A	"Combustion/Utility gas13A"

There is no GHG emissions related to the use of "Steam" and "Purchased electric power."

The life cycle GHG emissions related to the supply of purchased electric power differs greatly between countries, reflecting the electric power supply configuration. Therefore, it is not permitted to apply data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project to electric power purchased and used overseas.

### **E.1.2 Data to which "GHG Emission Factors for the CFP Pilot Project" is not applied**

#### **E.1.2.1 Electric Power Purchased Outside of Japan**

No data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project applies to this data item.

#### **E.1.2.2 Biodiesel and Bioethanol**

No data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project applies to this data item.

### **E.2 Life Cycle GHG Emissions Related to Water Supply**

For the life cycle GHG emissions related to the supply of water, the corresponding data in the Tentative Database of GHG Emission Factors for the CFP Pilot Project shall be used.

The correspondence shall be as follows:

	Data Name	Corresponding item
1	Tap water	"Tap water"



2	Industrial water	"Industrial water"
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When applying the data listed above as the amount of life cycle GHG emissions related to water supply in foreign countries, the validity of application of such data must be provided, since the data listed above is intended for water used in Japan.

### **E.3 Life Cycle GHG Emissions Related to Manufacturing of Containers, Packaging Materials, Materials used for Transport, and Other Materials**

- For plastics containers, packaging materials and materials used for transport, there are two types of secondary data: (1) Secondary data on resin manufacturing and (2) Secondary data on molding. When using these data, there shall not be unreported or double-counted life cycle GHG emissions related to molding.
- For paper containers, packaging materials and materials used for transport, there are secondary data on paper manufacturing and secondary data that takes into account paper manufacturing and molding. When using these data, there shall not be unreported or double-counted life cycle GHG emissions related to molding.
- The amount of life cycle GHG emissions related to transport is not included in the following secondary data list. The amount of life cycle GHG emissions related to transport shall be evaluated by collecting primary data or applying transport scenario for each life cycle stage.
- When applying the data from “Tentative Database of GHG Emission Factors for the CFP Pilot Project” and reference data listed below to materials manufactured in foreign countries and processes implemented in foreign countries, the validity of application of such data must be provided, since the data from “Tentative Database of GHG Emission Factors for the CFP Pilot Project” listed below is intended for materials manufactured in Japan and processes implemented in Japan.

#### **E.3.1 Plastic containers, Packaging Materials, and Materials used for Transport**

#### **E.3.1.1 Secondary Data of Resin Manufacturing**

For the life cycle GHG emissions related to the manufacture of resin, the corresponding data in the Tentative Database of GHG Emission Factors for the CFP Pilot Project shall be used.

#### **E.3.1.2 Secondary Data of Molding**

No data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project applies to this data item.

#### **E.3.1.3 Paper Containers, Packaging Materials, and Materials used for Transport**

No data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project applies to this data item.

#### **E.3.1.4 Metallic Materials**

For the life cycle GHG emissions related to the manufacture of metallic materials, the corresponding data in the Tentative Database of GHG Emission Factors for the CFP Pilot Project shall be used.

#### **E.3.1.5 Other Materials**

No data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project applies to this data item.

### **E.4 Life Cycle GHG Emissions Related to Treatment of Wastes and Wastewater**

#### **E.4.1 Application of GHG Emission Factors**

For the items below, "Manufacture" and "Combustion" of the said fuel type in the Tentative Database of GHG Emission Factors for the CFP Pilot Project shall be used. The correspondence is as follows:

	Data Name	Corresponding item
1	Crush	"Crushing"
2	Incineration	"General waste incineration"
3	Landfill	"Landfill (managed type)"

When applying the data listed above to processes implemented in foreign countries, the validity of application of such data must be provided, since the data listed above is intended for processes implemented in Japan.

Data for “Incineration” is the amount of life cycle GHG emissions derived from fuel consumption for incineration of waste. Therefore the amount of CO<sub>2</sub> emissions derived from carbon atoms in the waste must be separately calculated and added. Reference data related to the amount of life cycle GHG emissions derived from incineration of waste is shown in Section E.4.2.

#### **E.4.2 Data to which “GHG Emission Factors for the CFP Pilot Project” is not applied**

##### **E.4.2.1 Life Cycle GHG Emissions Related to Sewage Treatment**

No data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project applies to this data item.

##### **E.4.2.2 GHG Emissions from Incineration of Wastes**

No data from the Tentative Database of GHG Emission Factors for the CFP Pilot Project applies to this data item.

#### **E.5 GHG Emissions by Fuel Consumption per Transport Ton Kilometer**

For the items listed below, relevant data in the “Tentative Database of GHG Emission Factors for the CFP Pilot Project” may be used. For truck transport, however, the amount of life cycle GHG emissions from fuel consumption per transport ton-kilometer, for average loading rate, is not provided in the said Database. Therefore, the closest lower loading ratio (e.g. 50 % if average is 62 %) shall be applied when applying the GHG emission factors.

- Amount of life cycle GHG emissions from fuel consumption per transport ton-kilometer in truck transport, by vehicle size and by loading ratio
- Amount of life cycle GHG emissions from fuel consumption per transport ton-kilometer in railway transport

- Amount of life cycle GHG emissions from fuel consumption per transport ton-kilometer in ship transport, by vessel size

Data for truck transport and railway transport in the “Tentative Database of GHG Emission Factors for the CFP Pilot Project” listed above are intended for transport processes implemented in Japan. However, these data may be applied to overseas transport processes, since the amount of life cycle GHG emissions for truck transport and railway transport is dependent on the means of transport more than on country-specific circumstances.