# "Food Ingredient Distribution System" Product Category Rule (PCR-ID: CE-01)

Established on: 11/21/2006
Expires on: 11/20/2009

Note) The following standards have been developed solely for the purpose of implementing the EcoLeaf environmental labeling program. The use of these standards for any other purposes without the consent of the EcoLeaf program office is strictly prohibited.

| No. | Major Category | Subcategory | Class | Requirements |
|---|---|---|---|---|
| 1 | Preconditions | Products | Description | Transportation of food ingredients per ton, between production sites and bases, and bases and stores (excluding the production of food ingredients and the disposal of food at stores).<br>A production site refers to an agricultural produce collection center, processing center, etc.<br>A store refers to the final consignee of food ingredients transported within Japan, such as a restaurant, food retailer, food delivery service, etc. Specific examples include a supermarket, department store, and fast food outlet.<br>A base refers to a warehouse or transfer site that receives food ingredients from production sites within Japan and arranges the means of distribution to stores. |
| 2 | | | Scope | Transportation of food ingredients used in end products, where such ingredients are traceable and the environmental impact of the transportation and the load quantities of transportation vehicles can be calculated, adjusted or specified as necessary. |
| 3 | | Stages | Scope | Stages to be included are: (1) production and disposal of transportation vehicles; (2) distribution from production sites (production sites → bases); (3) bases (energy, packaging materials, etc.); (4) distribution from bases (bases→ stores)<br>* Refer to A and B in Appendix (1).<br>Packaging materials used during transportation or at bases, such as corrugated cardboard boxes, returnable containers and bands, are within the scope. Not included are the construction of buildings and production of equipment for bases. |
| 4 | Product Data Sheet (PDS) Input data for LCI: Lifecycle inventory analysis | Information on food ingredients to be declared | Types, amount, etc. of food ingredients | (1) List the shipping weight and typical yield per ton of each food ingredient type.<br>A "typical yield" represents the ratio of the shipping volume from production sites to the delivery volume to stores; the average value of actual measurements taken by each company should be used. Describe the basis for each typical yield in the verification documents.<br>(2) In the "Note" column, provide other information including the ratios of food ingredients to be declared. |
| 5 | | Information on the production and disposal of transportation vehicles | Materials, electricity and fuel required for the production and disposal | (1) Calculate "W" (kg or kWh): the material, electricity and/or fuel consumption during the production and disposal of each type of transportation vehicles (trucks, railcars, ships or airplanes) allocated in proportion to the environmental impact of the transportation, using data collected on the environmental impact of transportation "L" (t·km) and the amount of material and energy input "B," according to the following formula. * See Appendix (2)<br>$W(kg, kWh) = B(kg/t\cdot km, kWh/t\cdot km) \times L\ (t\cdot km)$<br>(2) The environmental impact of the production of special-purpose vehicles such as refrigerator cars shall be included in the calculation regarding them as general-purpose trucks; therefore its value shall be recorded as part of the environmental impact of transportation "L" (t·km) by truck.<br>(3) Data regarding the "production and dismantling of transportation vehicles" stage shall be provided based on the scenario assuming only the minimum extent of dismantling required. For information on CFC, provide only the usage rate of freezer and refrigerator cars in the "Supplemental environmental information" area. |
| 6 | | Information on distribution from production sites (production sites → bases) | Types, environmental impact, etc. of transportation vehicles | (1) List the names of transportation vehicle types used for each ton of food ingredients, along with either one of the following transportation data A, B or C for each transportation vehicle type.<br>A. Fuel consumption (kg), and the type of the fuel in the "Note" column<br>B. Transportation distance (km), and the mileage (km/kg) in the "Note" column<br>C. Environmental impact of transportation (t·km)<br>* Use the density given below when collecting fuel data in the unit of volume.<br>Gasoline: 0.75kg/L; Diesel oil: 0.83kg/L<br>(2) Provide information related to the transportation conditions in the "Note" column.<br>(3) When food ingredients are procured from overseas, figure in the environmental impact of the transportation from originating overseas ports or airports. |
| 7 | | Information on bases | Energy consumption, packaging materials, etc. | (1) Input and emission/discharge of energy and other resources (per ton of food ingredients)<br>· List the types and amount of energy and other resources used at bases for each ton of food ingredients<br>· Describe the intended uses of the energy/resources and other relevant information in the "Note" column. For processed products, include the energy used in the course of processing.<br>· Record food waste as emission/discharge. Each company may include other items that it considers important.<br>· Record the composting rate if food waste is composted.<br>(2) Usage of packaging materials (per ton of food ingredients)<br>· List the types and amount of packaging materials used.<br>· Describe the intended uses, number of uses and disposal methods of packaging materials in the "Note" column. |
| 8 | | Information on distribution from bases (bases → stores) | Types, environmental impact, etc. of transportation vehicles | (1) List the names of transportation vehicle types used for each ton of food ingredients, along with either one of the following transportation data A, B or C for each transportation vehicle type.<br>A. Fuel consumption (kg), and the type of the fuel in the "Note" column<br>B. Transportation distance (km), and the mileage (km/kg) in the "Note" column<br>C. Environmental impact of transportation (t·km)<br>* Use the density given below when collecting fuel data in the unit of volume.<br>Gasoline: 0.75kg/L; Diesel oil: 0.83kg/L<br>(2) Provide information related to the transportation conditions in the "Note" column. |

| No. | Major Category | Subcategory | Class | Requirements |
|---|---|---|---|---|
| 9 | Product Environmental Information Data Sheet (PEIDS) | Inventory analyses | LCI calculation formulae | (1) As a general rule, provide values based on each ton of food ingredients that reach the stores; however, where necessary, companies may calculate and include the values per ton of food ingredients that leave the production sites upon shipment.<br>(2) Values indicating the environmental impact associated with the transportation of food ingredients per t·km may also calculated and provided.<br>(3) LCI for the "production and disposal of transportation vehicles" stage shall be calculated based on the amount of materials and energy used "F" and the corresponding unit function "a", using the following formula (1).<br>LCI (kg) = a (kg/kg or kWh/kg) × F (kg or kWh) ... (1)<br>· For special-purpose vehicles such as refrigerator cars, calculate the environmental impact of their production and disposal regarding them as general-purpose trucks.<br>· For refrigerant CFC, assume that 100% is collected upon the disposal of vehicles and the energy consumption during the decomposition process of CFC can be disregarded.<br>(4) Use one of the following methods A, B or C to calculate "F" (the fuel and electricity consumption for each means of transportation). * See Appendix 3<br>A. Fuel method: calculation based on fuel consumption (kg)<br>B. Mileage method: calculation based on transportation distance (km) and mileage (km/kg)<br>C. t·km method: calculation based on the environmental impact of transportation (t·km) and loading ratio (%)<br>(5) Calculate the LCI for the "distribution from production sites" and "distribution from bases" stages, using data on the fuel/electricity consumption "F" by each means of transportation used and the EcoLeaf unit function "a" for the particular type of fuel/electricity "a", according to the formula (1)<br>(6) Include data on the input and disposal of packaging materials in the "bases" stage.<br>(7) Calculations regarding the distribution of corrugated cardboard boxes to recycling contractors shall be made based on the distance of 20 km, by means of a 2-ton truck and at the loading ratio of 100%. Use the latest data provided by the Corrugated Cardboard Recycling Council (95.2% as of October 2006, Corrugated Cardboard Recycling Council 2005 data).<br>(8) For packaging materials (including returnable containers used multiple times), make calculations concerning the disposal.<br>(9) Use the following formula to calculate the environmental impact "W" of returnable containers to be included:<br>$W = W' \times \eta 1 \times N/(N + 1)$<br>W': number of returnable containers used; η1: actual collection rate; N: number of reuse<br>(10) For the portion of food waste composted, exclude the environmental impact and deduction (recycle effect) of the composting process from the calculation. For the portion incinerated or landfilled, include the environmental impact calculated based on the assumption that 15.5% of the food waste is brought to landfill and the rest is incinerated.<br>(11) Calculate the global warming impact of each transportation vehicle type.<br>(12) Open recycling / reuse<br>When including data on open recycling and reuse, each company may create, while taking careful note of the following factors, a scenario considered appropriate to be used for the calculations. The appropriateness of the basis of the scenario will be subject to verification.<br>· Processes regarded within the scope of "indirect effects"<br>· Deductions and impact within the scope of "indirect effects" |
| 10 | | Impact analysis | Additional impact category | None |
| 11 | Breakdown Data Sheet (PDS-related) | Data processing | Allocation rule | As a general rule, data should be collected on each type of food ingredients and transportation vehicles, at each production site, base and store. However, where only aggregate data is available, allocate the value using an appropriate allocation method taking into consideration the transportation volume, distance, etc. Also describe the basis for selecting the particular allocation method. |
| 12 | | Data collection | Coverage | [Information on food ingredients]<br>(1) Collect 100% of data on the mass of food ingredients transported from production sites to bases, and bases to stores.<br>(2) Typical yields shall be based on actual data taken on each food ingredient type at each company in principle; however, if collecting actual data is difficult, companies may use aggregate values.<br>(3) Typical yields shall be determined from actual data on food ingredients such as vegetables transported from production sites to bases, or on overall food waste (loss).<br>[Common information on distribution]<br>(1) Calculate transportation distances based on road distances.<br>(2) For the distance or loading ratio, an aggregate or representative value may be used provided that the basis for using the particular value is explained.<br>When using an aggregate value for transportation that extends across more than one prefecture, a relevant prefectural government's office can be regarded as the location of the production site.<br>(3) When calculating the environmental impact of transportation from production sites to bases or bases to stores by each transportation vehicle type, the company may aggregate the value.<br>(4) When food ingredients are procured from overseas, figure in the environmental impact of the transportation from originating overseas ports or airports to bases.<br>(5) For special-purpose vehicles such as refrigerator cars, companies shall collect data on the mileage whenever possible to be used for related calculations. However, if collecting such data is impossible, calculations shall be made using values 1.16 times more than those of standard cars (as per the result of hearings with vehicle parts manufacturers).<br>(6) Companies are expected to take into consideration as much as possible the environmental impact of relocating transportation vehicles after completing the delivery to a base or store.<br>[Information on bases]<br>(1) As a general rule, actual data shall be collected on the electricity/fuel consumption and emission/discharge of food waste etc. at bases. However, companies may calculate values for these items by using the values measured at a representative base and allocating them in proportion to area ratios etc.<br>(2) The amount of packaging materials etc. used at bases may be calculated using data sourced from the actual shipping records of a representative base.<br>[Common rules]<br>The term of data collection for each category is one year in principle. |

| No. | Major Category | Subcategory | Class | Requirements |
|---|---|---|---|---|
| 13 | | | Cut-off rules | (1) All collected data shall be allocated to 100% of the total volume. When applying a cut-off rule, clearly indicate it on the form and clarify the reason.<br>(2) For transportation data (distance, means, etc.) based on each type of food ingredients, data on the distribution from bases may be cut off if the particular food ingredient accounts for 1% or less of the total weight of all ingredients. However, for all food ingredients combined, transportation data on at least 90% of the total weight of all ingredients shall be collected. |
| 14 | Breakdown Data Sheet (PEIDS-related) | Database | Selection of unit functions | (1) The following common unit function names shall be applied upon the calculations of the LCI for the production and disposal of transportation vehicles:<br>"Cold-rolled steel" for iron, "Al" for nonferrous metal, "PP" for plastic, "SBR" for rubber, "wood chip (Japan)" for wood, "corrugated cardboard" for corrugated cardboard.<br>(2) For bags and bands, use unit function names that apply to their materials. |
| 15 | | | Addition of unit functions | None, however will be added as necessary. |
| 16 | | | Addition of characterization factors | None, however will be added as necessary. |
| 17 | Product environmental aspects declaration (PEAD) | Outline of the system | | In section C, indicate the name of the distribution system and the names of the transported food ingredients to be declared. Provide the system outline below those names.<br>· The name of the distribution system may be omitted.<br>· The names of the transported food ingredients to be declared shall be the names of ingredients transported, and not the names of end products.<br>· The following information shall be included in the outline of the system.<br>(1) The fiscal year for which the data have been collected (fiscal year covered<br>(2) The names of the transported food ingredients to be declared<br>(3) The means of transportation used<br>(4) The overseas procurement rate (specify the names of the main exporting countries.)<br>(5) The extent of the distribution (the number of production sites, bases and stores, etc.). This information may be provided in other sections of the PEAD. |
| 18 | | Data disclosure | | (1) Required items: energy consumption, global warming impact, and acidification impact<br>(2) Lifecycle stages to be disclosed: use the combined values from all lifecycle stages.<br>(3) Provide a bar graph illustrating the global warming impact, including values from individual lifecycle stages as well as the total value.<br>(4) Each company may also declare values indicating the impact associated with each ton of food ingredients shipped from production sites, or values indicating the environmental impact of the transportation of food ingredients per t·km.<br>Include a statement "Clearly indicate that the values representing the environmental impact are based on each ton of food ingredients delivered to stores" in Form 1.<br>(5) The ratios of the $CO_2$-equivalent emission/discharge by individual transportation vehicles may also be provided.<br>(6) Include a note providing the following information at the bottom of section E:<br>· Explanation (description) on production sites, stores, bases, etc. (see the definitions provided in the class no. 1 of this PCR).<br>· Information indicating whether return trips are included in the scope of calculations related to the transportation of food ingredients. |
| 19 | Supplemental environmental information | Optional information | | Companies can include the information if they have the following certification or qualifications:<br>· ISO 14001 certification<br>· Modal shift information<br>· Accreditation, awards, agreements or cooperation from/with the government or industry entities<br>· Introduction of environmentally friendly practices: eco-cars, energy-efficient operation, etc.<br>· Accreditation concerning type I and/or type III environmental labels<br>· Percentage of stores using joint distribution<br>· Other information |

[Note]

· The use of words "transportation" and "distribution" in PCR:
"Transportation" is used in this PCR in principle, with the exceptions of "distribution of food ingredients," "distribution from production sites" and "distribution from bases," which are expressions generally used within the distribution industry.

· Since the composition of lifecycle stages and their elements defined in this PCR are slightly different than those laid out in the standard EcoLeaf forms, use the forms specially created for this PCR: for the standard EcoLeaf Form 2 "PEIDS" and Form 3 "PDS," use Form 2 (CE) and Form 3 (CE) respectively (these forms are provided at the end of this document).

Form 1 (F-01-02)

# 製 品 環 境 情 報
# Product Environmental Aspects Declaration

## Food Ingredient Distribution System (PCR-ID: CE)

No. XX-05-001


**Mos Food Services, Inc.**

http://www.mos.co.jp
22 Tansu-machi, Shinjuku, 162-8501
<Contact>
Environmental Management Group
TEL: 03-3266-8744
FAX: 03-3266-0741


## Mos Food ingredient distribution system

**(Lettuce, tomatoes, whole onions, and pre-cut and packaged onions)**

Information on main production sites, bases and stores

Number of main production sites: 35

Distribu-tion

Number of bases within the system: 7

Distribu-tion

Number of stores within the system: 1472

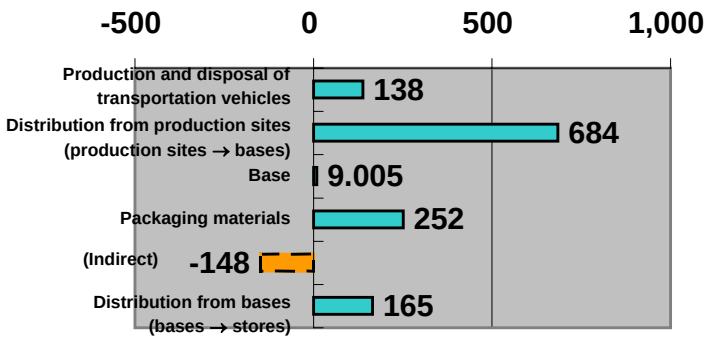
### <Outline of the System>

| Fiscal year | April 1, 2004 to March 31, 2005 |
|---|---|
| Food ingredients concerned | Lettuce, tomatoes, whole onions, and pre-cut and packaged onions |
| Means of transportation | Truck, rail, ship, and airplane |
| Overseas procurement rate | 0% |

**<Lifecycle Environmental Impact (per ton of food ingredients)>**

| Environmental impact | Direct impact only | Including indirect impact |
|---|---|---|
| Energy consumption (MJ) | 17,770.9 | 15,593.4 |
| Global warming (kg - $CO_2$ equivalent) | 1,248.2 | 1,100.0 |
| Acidification (kg - $SO_2$ equivalent) | 1.5 | 1.3 |

**Global warming impact (per ton of food ingredients)** **Unit: kg**




* The orange bar represents the effect of packaging recycling.

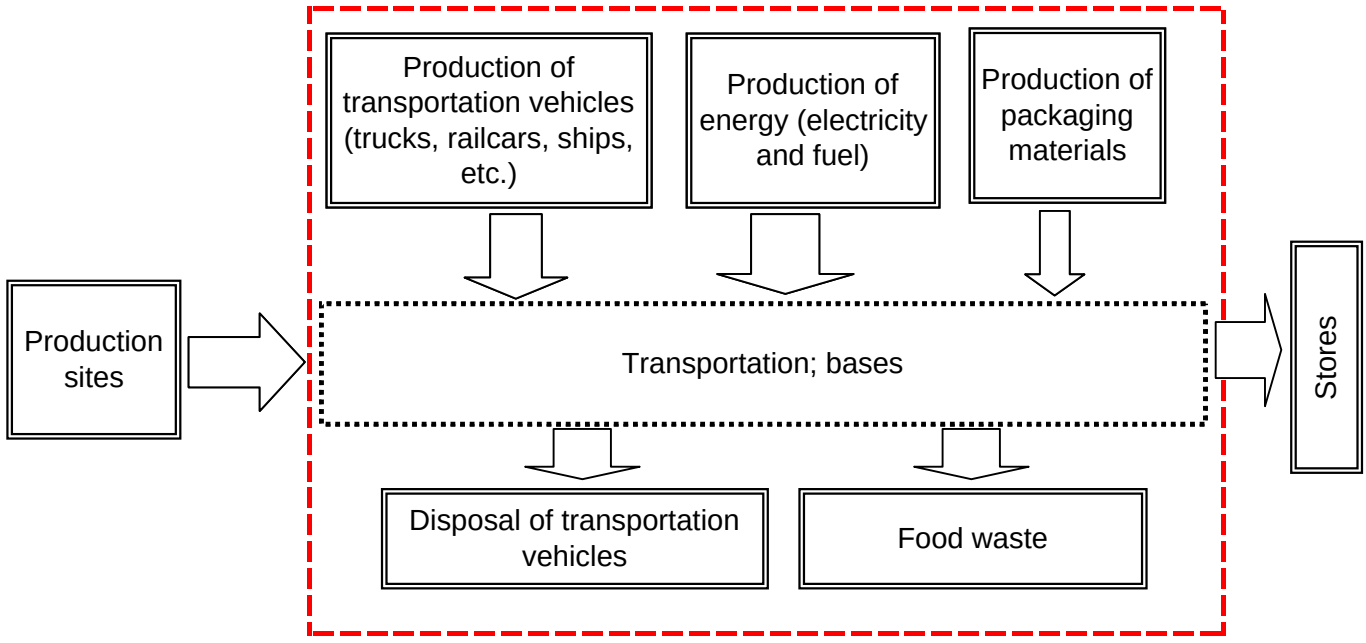
- A production site refers to an agricultural produce collection center, processing center, etc. within Japan.
- A store refers to the final consignee of food ingredients transported within Japan, such as A supermarket, department store, and fast food outlet.
- A base refers to A warehouse or transfer site within Japan that receives food ingredients from production sites and arranges the means of distribution to stores.

(Note)
1. Original LCA data is available on PEIDS: Product Environmental Information Declaration Sheet, and Product Data Sheet.
2. Unified rules and requirements for EcoLeaf LCA, for intended product category, are available as a PSC: Product Specification Criteria.
Visit EcoLeaf website under JEMAI homepage at http://www.jemai.or.jp/ecoleaf_e/ for details.
3. "Recycle Effect" indicates an indirect environmental impact on other products/services.
4. Though a country shpping this prouduct is [ ], basic units used for calculations are based on Japan domestic data at this time, due to a lack of base data to

## [Supplemental environmental information]

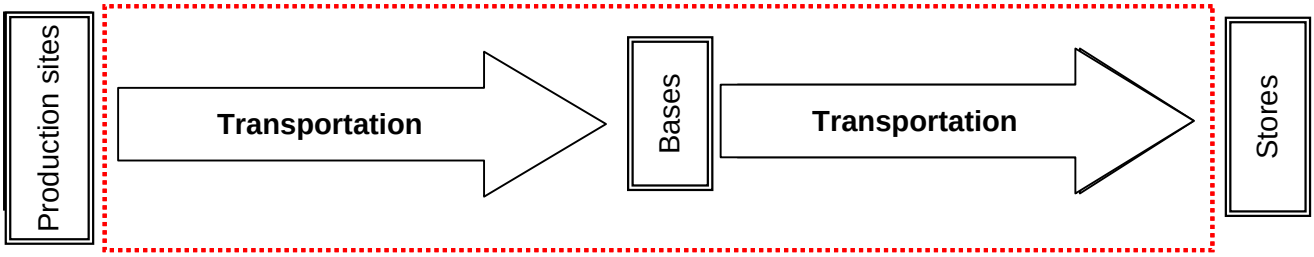
ISO certification: Mos Food Services, Inc. and Mos Burger chain stores are certified under ISO 14001.
Modal shift (distribution: production sites → bases) xxx km - one natural gas vehicle (bases → stores) and three hybrid vehicles
A voluntary agreement was signed with the Ministry of the Environment of Japan on September 12, 2006.
Returnable containers with IC tag (production sites → bases → stores) have been introduced to xxx stores.
Joint distribution rate: xxx stores/1472 stores; refrigerator car usage rate: xxx%

## A. Scope of LCA regarding distribution system




Scope of LCA: inside the dotted-line (.....) rectangle

## B. Scope of LCA data collection regarding distribution system




Scope of LCA: inside the dotted-line (.....) rectangle

* Definition of a production site: an agricultural produce collection center, processing center, etc.
* Definition of a store: the final consignee of food ingredients transported within Japan, such as a supermarket, department store, fast food outlet, etc.

# Calculation of material and energy input (Wm) during the production and dismantling of transportation vehicles

The material and energy input (Wm) during the production and dismantling of each transportation vehicle (i), allocated in proportion to the environmental impact of transportation (Li), shall be calculated using the following formula.

$$Wm = Bmi \times Li$$

* Note: "t·km" shall be used as the unit to indicate the environmental impact of transportation instead of "kg·km."

[Calculation example] When the environmental impact of rail transportation (Li) is 150,000 t·km,

Cold-rolled steel: $Wm = Bmi \times Li = 0.00104$ kg/t·km $\times$ 150,000 t·km = 156 kg

Electricity: $Wm = Bmi \times Li = 0.00192$ kWh/t·km $\times$ 150,000 t·km = 288 kWh

:

Table 1: Material and energy input factor (Bmi) during the production and dismantling of transportation vehicles

| Item | Unit function name (m) | Unit | Transportation vehicle name (i) | | | |
|---|---|---|---|---|---|---|
| | | | Truck | Rail | Ship | Airplane |
| Material | Iron (cold-rolled steel) | kg/t·km | 4.70E-03 | 1.04E-03 | 2.27E-03 | 0.00E+00 |
| | Nonferrous metal (Al) | kg/t·km | 3.71E-04 | 4.45E-04 | 0.00E+00 | 2.12E-02 |
| | Plastic (PP) | kg/t·km | 3.10E-04 | 1.65E-04 | 0.00E+00 | 0.00E+00 |
| | Rubber (SBR) | kg/t·km | 3.10E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Wood | kg/t·km | 4.95E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Energy | Electricity (kWh) | kWh/t·km | 1.88E-02 | 1.92E-03 | 1.13E-03 | 8.11E-02 |
| | Heavy oil (kg) | kg/t·km | 0.00E+00 | 0.00E+00 | 5.83E-05 | 0.00E+00 |

References:

* Information related to lifecycle data (e.g. comparison of CO2 emissions between production, operation and dismantling stages)
  1) Railway Technical Research Institute, "Symposium on Comprehensive Assessment of Environmental Impact of Railways" held on August 24, 2005
* Production of trucks (data on raw material composition, electricity consumption during assembly, etc. collected on 4-ton trucks from 4 companies)
  2) Paper presented by the Japan Automobile Manufacturers Association, Inc. at the "Fourth International Conference on Eco-Balance" held on October 31 - November 2,
* Production of railcars (data on raw material composition, electricity consumption during assembly, etc. according to the result of the survey of Japan Railways railcar manufacturers, compiled by the Japan Resources Association)
  3) Japan Resources Association, January 13, 1999: Life Cycle Energy in Metropolitan Life. Anhorume Co Ltd.
* Production of ships (data on raw material composition, electricity and heavy oil consumption during assembly, etc. collected on 76,000-ton bulk carrier ship)
  4) National Maritime Research Institute, "LCA Symposium" held on January 11, 2006
* Production of airplanes (raw material: aluminum; raw material / assembly: 9/1 of ships and railcars)

# "Food Ingredient Distribution System" Product Category Rule (PCR-ID: CE-01)

Appendix (3)

## Methods for calculating fuel and electricity consumption during distribution

1. Fuel method

Collect data on fuel consumption by each means of transportation and convert the value from fuel unit L to kg.

Fuel consumption (kg) = fuel consumption (L) × γ (kg/L)

| |
|---|
| Gasoline fuel density γ = 0.75 kg/L |
| Diesel oil fuel density γ = 0.83 kg/L |

2. Procedure for calculating fuel consumption using the mileage method

Collect data on the mileage (km/L) and transportation distance (km) of each means of transportation, and calculate the fuel consumption according to the following formula:

Fuel consumption (kg) = transportation distance (km) / mileage (km/L) × γ (kg/L)

3. Procedure for calculating fuel consumption using the t·km method

(1) Collect data on the loading ratio Y (%) and environmental impact of transportation W (t·km) of each means of transportation (data on the loading ratio should be collected whenever possible, although not mandatory).

(2) Calculate the fuel/electricity consumption b per t·km (kg/t·km or kWh/t·km) by each means of transportation according to the following procedures:

- For transportation by truck

  Calculate X (L/t·km) using data on the maximum loading capacity Z (kg) and loading ratio Y (%) according to the following formula (1) or (2):

  Gasoline fuel: $\ln(X) = 2.67 - 0.927 \cdot \ln(Y/100) - 0.648 \cdot \ln(Z)$ ... (1)

  Diesel oil fuel: $\ln(X) = 2.71 - 0.812 \cdot \ln(Y/100) - 0.654 \cdot \ln(Z)$ ... (2)

  X (L/t·km): fuel consumption per t·km; Y (%): loading ratio; Z (kg): maximum loading capacity

  Then convert the value to b (kg/t·km) using the fuel density γ

  $b = X \times \gamma$

  * If the actual loading ratio Y is not known, use the fuel consumption b per t·m calculated based on the average loading ratio found in Table 1.

- For transportation by rail, ship or airplane, use fuel/electricity consumption b listed in Table 2.

(3) Calculate the fuel/electricity consumption F (kg or kWh) by each means of transportation, using W obtained in step (1) and b obtained in step (2) above, and according to the following formula (3):

F (kg or kWh) = b (kg/t·km or kWh/t·km) × W (t·km) ... (3)

Table 1: Fuel consumption b per t·km by a truck (commercial freight vehicle) (to be referenced when the actual loading ratio is unknown)

| Fuel | Maximum loading capacity Z (kg) | Average loading ratio Y (%) | Fuel consumption b (kg/t·km) | Vehicle type |
|---|---|---|---|---|
| Gasoline | Light vehicle | 41 | 0.5558 | Light freight vehicle |
| | Under 2000 | 32 | 0.3540 | Van, cargo van, 1-ton truck |
| | 2000 or more | 52 | 0.1440 | 2-ton truck |
| Diesel oil | Under 1000 | 36 | 0.4914 | Van, cargo van |
| | Under 2000 | 42 | 0.2117 | 1-ton truck |
| | Under 4000 | 58 | 0.1029 | 2-ton truck |
| | Under 6000 | 62 | 0.0701 | 4-ton truck, 5.5-ton truck |
| | Under 8000 | 62 | 0.0562 | 7.5-ton truck, single-container transport truck |
| | Under 10000 | 62 | 0.0477 | 8-ton truck, 9-ton truck |
| | Under 12000 | 62 | 0.0418 | 10-ton truck |
| | Under 17000 | 62 | 0.0349 | 13-ton truck, double-container transport truck, tractor |

* For a transport truck or tractor, apply the maximum loading capacity including the weight of containers.

Source: The Ministry of Economy, Trade and Industry Notification No. 66, Appendix 3 (conversion of fuel unit from L to kg)

Table 2: Fuel/electricity consumption b per t·km by a transportation means other than a truck

| No | Item | Fuel type | Value | |
|---|---|---|---|---|
| 1 | Rail(kWh/t·km) | Electricity | 0.0503 | |
| 2 | Ship(kg/t·km) | Heavy oil | 0.0119 | |
| 3 | Airplane(kg/t·km) | Kerosene | 0.4779 | The majority of jet fuel used for Japan's domestic commercial airplanes is No. 1 kerosene (illuminating kerosene). |

Source: The Ministry of Economy, Trade and Industry Notification No. 66, Appendix 4 (conversion of energy consumption MJ to fuel or electricity consumption kg or kWh)

Name of the Ministry of Economy, Trade and Industry Notification No. 66:
Notification No. 66 "Method of Calculating the Energy Usage Involved in the Transport of Cargo Carried out by Freight Haulers" based on the Ministry of Economy, Trade and Industry Notification No. 66 (in effect as of April 1, 2006) issued according to the "Act on the Rational Use of Energy."

"Food Ingredient Distribution System" Product Category Rule (PCR-ID: CE-01)

Appendix (4)

Form 2 (CE)

# Product Environmental Information Data Sheet(PEIDS)

| | |
|---|---|
| Document control no. | F-02-02(CE) |
| Product vendor | |
| EcoLeaf registration no. | |

| | |
|---|---|
| Unit Function DB version | |
| Characterization Factor DB version | |

| | | | |
|---|---|---|---|
| PSC name | | | |
| PCR-No. | | Transported food ingredients | 1t |

| In/Out items \ Life Cycle Stage | | | | | Unit | Production and disposal of transportation vehicles | Distribution from production sites (production sites → bases) | Bases | | Distribution from bases (bases → stores) | Recycle effect |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Energy etc. | Packaging materials etc. | | |
| Energy Consumption | | | | | MJ | | | | | | |
| | | | | | Mcal | | | | | | |
| Inventory analyses | Impact by Resource Consumption | Exhaustible resources | Energy resources | Coal | kg | | | | | | |
| | | | | Crude oil (for fuel) | kg | | | | | | |
| | | | | LNG | kg | | | | | | |
| | | | | Uranium content of an ore | kg | | | | | | |
| | | | Mineral resources | Crude oil (for material) | kg | | | | | | |
| | | | | Iron content of an ore | kg | | | | | | |
| | | | | Cu content of an ore | kg | | | | | | |
| | | | | Al content of an ore | kg | | | | | | |
| | | | | Ni content of an ore | kg | | | | | | |
| | | | | Cr content of an ore | kg | | | | | | |
| | | | | Mn content of an ore | kg | | | | | | |
| | | | | Pb content of an ore | kg | | | | | | |
| | | | | Sn content of an ore | kg | | | | | | |
| | | | | Zn content of an ore | kg | | | | | | |
| | | | | Au content of an ore | kg | | | | | | |
| | | | | Ag content of an ore | kg | | | | | | |
| | | | | Silica Sand | kg | | | | | | |
| | | | | Halite | kg | | | | | | |
| | | | | Limestone | kg | | | | | | |
| | | | | Natural soda ash | kg | | | | | | |
| | | Renewable resources | | wood | kg | | | | | | |
| | | | | water | kg | | | | | | |
| | Impact by Emission/Discharge to the environment | to Atmosphere | | CO2 | kg | | | | | | |
| | | | | SOx | kg | | | | | | |
| | | | | NOx | kg | | | | | | |
| | | | | N2O | kg | | | | | | |
| | | | | CH4 | kg | | | | | | |
| | | | | CO | kg | | | | | | |
| | | | | NMVOC | kg | | | | | | |
| | | | | CxHy | kg | | | | | | |
| | | | | dust | kg | | | | | | |
| | | to Water system | | BOD | kg | | | | | | |
| | | | | COD | kg | | | | | | |
| | | | | N total | kg | | | | | | |
| | | | | P total | kg | | | | | | |
| | | | | SS | kg | | | | | | |
| | | to Soil system | | Unspecified Solid Waste | kg | | | | | | |
| | | | | Slag | kg | | | | | | |
| | | | | Sludge | kg | | | | | | |
| | | | | Low level radio-active waste | kg | | | | | | |
| Impact assessment | by Resource consumption | Exhaustible resources | | Mineral | kg | | | | | | |
| | | | | Energy | kg | | | | | | |
| | | | | | | | | | | | |
| | by Emission/Discharge to the environment | to Atmosphere | | Global Warming | kg | | | | | | |
| | | | | Acidification | kg | | | | | | |
| | | | | | | | | | | | |
| | | to Water system | | Eutrophication | kg | | | | | | |
| | | to Soil system | | | | | | | | | |

**Breakdown of global warming impact ($CO_2$ equivalent)**

| Means of transportation | | Truck | Rail | Ship | Airplane |
|---|---|---|---|---|---|
| Stage of distribution from production sites | kg | | | | |
| Stage of distribution from bases | kg | | | | |

**[Notes for readers: EcoLeaf common rules]**

**I Stage related**

1. **Information on materials and energy required for the production and disposal of transportation vehicles: consists of the consumption of energy etc. input during the production and dismantling/disposal of trucks, railcars, ships and airplanes.**
2. **Information on distribution from production sites: consists of the consumption of energy etc. input during the transportation of food ingredients from production sites to bases.**
3. **Information on bases: includes the consumption of energy etc. and disposal of food ingredients at bases, as well as the production and disposal/recycling of packaging materials used for the distribution from production sites and from bases. Also includes energy consumption during food processing at bases.**
4. **Information on distribution from bases: consists of the consumption of energy etc. input during the transportation of food ingredients from bases to stores.**
5. **Recycle effect: indicates an indirect environmental influence to other products/services by use of reclaimed materials/parts, and/or by supply of used products to other businesses for material reclaim/parts reuse.**

*** Use of reclaimed materials/parts: Sum of increase of environmental impact by collection activities of used materials/parts, and decrease by volume reduction of used materials/parts.**

*** Supply of used products to other businesses for material reclaim/parts reuse: Sum of increase of environmental impact by materials/parts reclaiming process, and decrease by volume reduction of new materials/parts production.**

**[Notes for readers: EcoLeaf common rules]**

**II. Inventory analyses**

**A. Data of mineral ore on "Exhaustible resources" are presented in weight of pure ingredients (e.g. iron, aluminum) in the ore.**

**B. Data on energy resources are presented based on origin in calorific value. e.g. Data on uranium ore presents weight of uranium concentrate, which is available for use as an atomic fuel.**

**C. Data of discharge to water system are in actual figure (not calculated using unit function in inventory analyses).**

**III. Impact analyses**

**Result of the "Impact analyses" is found in converting results of inventory analyses into total amount of a reference material (e.g. CO2 in case of "Global Warming").**

**A. Impact "by resource consumption" represents magnitude of impacts to resource depletion.**

**B. Impact "by emission/discharge to environment" represents magnitude of impacts to Atmosphere, Water and Soil system.**

**IV. Data entry format**

**A. Exponential notation, after the decimal point to two, should be used.**

**B. Indicate "0" instead exponential notation, if the result of calculation or estimation is considered as "zero" or negligible in comparison to related results.**

**C. Indicate "-" if calculation nor estimation can not be done, in order to differentiate to indicate "zero".**
**(BGD for material production are for production from mineral ore. Those data do not include reclaiming processes like recovery from scrap.)**

**[Notes for readers: Target product specific]**

1. **Recycle effect indicates the effect of the recycling of packaging materials based on the information on bases.**
2. **The conversion of the impact of transportation to the fuel and electricity consumption using the "t-km" method is based on the Ministry of Economy, Trade and Industry Notification No. 66 "Method of Calculating the Energy Usage Involved in the Transport of Cargo Carried out by Freight Haulers."**

Form 3 (CE)

# Product data sheet

(Input data and parameters for LCA)

| Document control no. | F-03-02(CE) |
|---|---|
| Product vendor | |
| EcoLeaf registration no. | |

| PSC name | | Product type | |
|---|---|---|---|
| LCA/LCIA in units of: | | Transported food ingredients | 1t |

## 1. Information on food ingredients (per ton)

| No. | Food ingredient name | Typical yield | t | Note |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## 2. Information on materials and energy required for the production and disposal of transportation vehicles (per ton of food ingredients; expected service life considered)

| Classification | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Distribution | | | | | | | | |
| Quantity | | | | | | | | |
| Note | | | | | | | | |

## 3. Information on distribution from production sites (production sites -> bases) (per ton of food ingredients)

| No. | Transportation vehicle name | Unit | Value | Note |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## 4. Information on bases (per ton of food ingredients)

(1) Input and discharge/emission of energy etc. (per ton of food ingredients)

| No. | Item | Unit | Value | Note |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

(2) Usage of packaging materials etc. (per ton of food ingredients)

| No. | Item | Unit | Value | Note |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## 5. Information on distribution from bases (bases -> stores) (per ton of food ingredients)

| No. | Transportation vehicle name | Unit | Value | Note |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## 6. Others

[Note]